a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

EDCP 571
Bruno Latour and the Postsecular Turn in STS
Lecture Notes

S. Petrina (18 September 2013)

1. **History of STS**
    a. Historiography of STS
        i. Cutcliffe (1990, 2000, 2001)
        ii. Fuller (1999, 2001)
        iii. Sismondo (2008)
        iv. Jasanoff (2012)
    b. History and Philosophy of Science (HPS)
        i. *Isis* (1913)
        ii. History of Science Society (HSS) (1924)
        iii. George Sarton (1918, 1919, 1921)
    c. History and Philosophy of Technology (HPT)
        i. Society for the History of Technology (SHOT) (1958)
        ii. *Technology and Culture* (1960)
        iii. Mel Kranzberg (1963)
    d. Science, Technology and Society (STS)
        i. Why is it Science, Technology and Society (STS) and not Science, Technology, and Culture (STC)?
            1. Science and Society
                a. Robert Millikan ("Science and Society," Address delivered at the Commencement of Stanford University, 18 June 1923, p. 294): *One of the greatest contributions of science to life is the discovery that progress is in general made by the evolutionary process*. Einstein does not replace Newton; he merely supplements him. There are no revolutions in science. In so far as Newtonian mechanics was a body of experimental facts it is eternally true. The whole of Newton is incorporated in Einstein. *Let the revolutionary reformer ponder well that fact*.
                b. *Science & Society* (Launched fall, 1936): *Science and Society* has been founded to meet the need, increasingly evident in the United States, for a journal dedicated to the growth of Marxian scholarship. It aims to publish articles, communications and reviews illustrating the manner in which Marxism integrates the various scientific disciplines and illuminates the interdependence of science and society. Studies in the fields of natural and social sciences, even the most technical and specialized, will be brought into the focus of a world movement against reaction and obscurantism.
            2. Technology and Culture
                a. Coyle ("Technology and Culture," 1936)
                b. Odum ("Notes on the Technicways in Contemporary Society," 1937, pp. 338-339): Now if we view these inventional influences on the screen of a million and a quarter patents granted in the United States alone since i900, it is possible to sense something of the enormous area and power back of the emerging *technicways*. What is needed, however, is to know, not only the nature and extent of these

inventional influences but how they work. This knowledge, it seems to me, can be attained only through the study of the *technicways* which, as a refined or weighted index and the bridging, constant factor between technology and culture, where physical science and social science meet, may be key to both the understanding and direction of the new adaptation of man in the new world of science, invention, technology.

c. *Technology and Culture* (Launched 1960)
d. Steffans & Muller, *Science, Technology and Culture* (1975)

ii. Intellectual and Social Movement

1. Robert K. Merton
    a. *Science, Technology and Society in Seventeenth Century England* (1938): This study might be more exactly entitled "some sociologically relevant aspects of certain phases of the development of science in seventeenth century England." For it is not a history of science, technology and society during this period. It does not touch on all phases of the subject but deals only with the more elementary of them. Many of the historical details which it contains are indeed widely known, although their sociological implications are less widely recognized. To be sure, the view that the science of any period is not divorced from its social and cultural context has become, properly enough, a common-place, but there are few empirical studies of the relations which do obtain. Many persons in our own day view the extended investigations of science as comprising an activity natural to man; hence, as neither requiring nor being susceptible to further analysis. This study is concerned above all with some of the cultural roots of the modem acclaim and patronage of science. In more general terms, it is an empirical examination of the genesis and development of some of the cultural values which underlie the large-scale pursuit of science.
    b. "Sociology of Knowledge" (1937): The last two decades have witnessed, especially in Germany and France, the rise of a new discipline, the sociology of knowledge (*Wissenssoziologie*), with a rapidly increasing number of students and a growing literature (even a "selected bibliography" would include several hundred titles). Since most of the investigations in this field have been concerned with the socio-cultural factors influencing the development of beliefs and opinion rather than of positive knowledge, the term "*Wissen*" must be interpreted very broadly indeed, as referring to social ideas and thought generally, and not to the physical sciences, except where expressly indicated. Briefly stated, the sociology of knowledge is primarily concerned with the "dependence of knowledge upon social position" and, to an excessive and fruitless degree, with the epistemological implications of such dependence. In fact, as we shall see, there is a growing tendency to repudiate this latter problem as it becomes increasingly apparent that the social genesis of thought has no necessary bearing on its validity or falsity.
    c. Shell Companies Foundation Lectures on Science, Technology, and Society at Johns Hopkins University (1964)
        i. *Science as a Cultural Force* (1964)
            1. This collection of four essays brings together the outer, external public aspect of scientific activities,

and the internal, private world of scientific thought. Originally delivered as lectures at Johns Hopkins University for the Shell Companies Foundation Lectures on Science, Technology, and Society, these essays touch upon the broader aspects of scientific progress, emphasizing the mutual interaction of science and society.

   d. Morehouse (1967): "Confronting a Four-Dimensional Problem: Science, Technology, Society, and Tradition in India and Pakistan"

2. Thomas Kuhn
   a. *Structure of Scientific Revolutions* (1962)
   b. Sismondo (2008): A standard history of STS might start with Thomas Kuhn's *Structure of Scientific Revolutions* (1962), which emphasized the communal basis of the solidity of scientific knowledge, the perspectival nature of that knowledge, and the hands-on work needed to create it. More importantly, the popularity of Kuhn's book and iconoclastic readings of it opened up novel possibilities for looking at science as a social activity. In this way, Kuhn's work helped make space for another starting point in the field, David Bloor's (1976) and Barry Barnes's (1974) articulation of the "strong program" in the Sociology of Knowledge. The strong program starts from a commitment to naturalist explanations of scientific and mathematical knowledge, to investigating the causes of knowledge….

      Unfortunately, the narrative so far is entirely a High Church one, to adopt Fuller's useful analogy…. But there is also a Low Church, less concerned with understanding science and technology in and of themselves, and more with making science and technology accountable to public interests.
   c. Fuller (2001, pp. 251, 252, 253): Thomas Kuhn (1922-1996) was the most influential figure in the history of science and technology studies (STS) who did not consider himself a practitioner of the field. Indeed, notwithstanding his explicit disclaimers to the contrary, Kuhn is nowadays often presented as our founding philosopher. The *Structure of Scientific Revolutions* quickly found its way into the course out lines of the Edinburgh School, and to this day, non-STSers typically get a fix on what STS is about by starting with the ways Kuhn supposedly revolutionized our conception of science. In a recent book (Fuller 2000), I have argued that Kuhn's disclaimers should have been taken more seriously to understand both where he was coming from and how the development of STS has been subsequently channeled-and, I would claim, stunted.
   d. Kuhn has cast a very long shadow on the history of STS but ultimately more in terms of the field's self-understanding than any substantive theses STS may have derived from Kuhn for understanding other disciplines. Only a field in the grip of "paradigmitis such as ours would see Bruno Latour's actor-network theory as a radical maneuver, since Latour's opposition to STS's founding philosophical and sociological themes coincides with an embrace of neoliberal research strategies that threaten to undermine the institutional autonomy of the university (Fuller 2000, chap. 7). In

my darker moments, I believe that Kuhn's most lasting contribution to STS has been to facilitate the field's detachment from the sociology of knowledge. Whereas Karl Mannheim and his Marxist forebears would be quick-perhaps too quick-to note the correspondence between epistemic formations and social interests, STS seems to lack the requisite reflexivity to recognize this phenomenon in its own backyard.

3. **Futurism and Policy Studies**
    a. Technological Forecasting
        i. *Recent Social Trends In The United States* (President's Research Committee on Social Trends, 1933)
        ii. *Technological Trends and National Policy* (National Resources Committee, 1937)
        iii. *Toward New Horizons* (United States Army Air Forces, 1947), marked the "beginnings of organized futurist research" (Ferkiss, 1977, p. 9) (Petrina, 2013)
        iv. Ralph Lenz's 1958 MIT master's thesis: "the first serious attempt to apply scientific methods to the forecasting of technological change" (Martino, 1972, p. 371)
    b. Technology Assessment
        i. *Technology Assessment Act of 1972* (13 October 1972) created the Congressional Office of Technology Assessment (OTA, 1988). OTA is for "helping citizens understand the events of science and the technological challenges and options before us" (Gibbons, 1988, p. 4).
    c. Environmental Assessment
        i. *Science, Growth and Society* (OECD, 1971): Member countries are asked to consider future needs for technological and environmental assessment in planning the level and orientation of fundamental research.
        ii. Declaration of The United Nations Conference on The Human Environment (16 June 1972):
            1. Earthwatch global environmental assessment programme (Jensen & Brown, 1981).
    d. Impacts
        i. Social Impacts
        ii. Environmental Impacts
        iii. Scientific Impacts
        iv. Technological Impacts v Determinism (STS Critique & Debate)
            1. Impact discourse reflects a mechanistic and deterministic view of technology; indeed, a view suggesting that technology determines social and cultural direction. Society and individuals merely roll with, and adapt to technological change.
            2. Staudenmaier (1989): historians of technology labor to situate each artifact within the limited, historically specific, value domains from which they emerged and in which they operate. They speak of "technologies," and not Technology," of cultural options rather than inevitable progress. This approach attempts what history traditionally holds

> dear, the liberation of human beings by demythologizing false absolutes and by paying attention to the human context of change…. Responsible technology talk fosters a language of engagement where "Technology" is understood to be a variety of particular technologies, each carrying its own embedded values, each related to its own unique cultural circumstance. It is a language that reweaves the human fabric, reintegrating method and context, and inviting us all, technical practitioners and ordinary citizens alike, to engage in the turbulent and marvelous human endeavor of our times. (pp. 285, 287)

e. Falk (1967, p. 51): scienomics, of the science of science, of the social relations of science, of the humanities of science—to use some of the current terms—falls into two broad categories. The first—for which we shall use the term basic scienomics is concerned with theoretical, philosophical and historical questions. It attempts to penetrate to the heart of the socio technological revolution; to discover its social, political and ethical implications. The second—applied scienomics embraces the multiplicity of fact-finding, data-producing and statistical studies which should form the basis on which day-to-day administrative decisions are made.

4. Activism and Environmentalism

Cutcliffe (2000, 2001): During the mid-1960s, however, tensions regarding the science-technology-society relationship took on a new form, in large part reflecting a perceived need for a more complete understanding of the societal context of science and techno logy. STS emerged in a period of widespread social upheaval, itself reacting in pan to the social-cultural quiescence of the 1950s. Scholars and more activist critics alike began to raise doubts about the theretofore largely unquestioned beneficence of science and technology that had become the post-World War Il consensus…. Among more popular writers, Rachel Carson's 1962 Silent Spring raised serious questions about the hazards associated with chemical insecticides such as DDT and in many ways helped to crystalize the contemporary environmental movement.

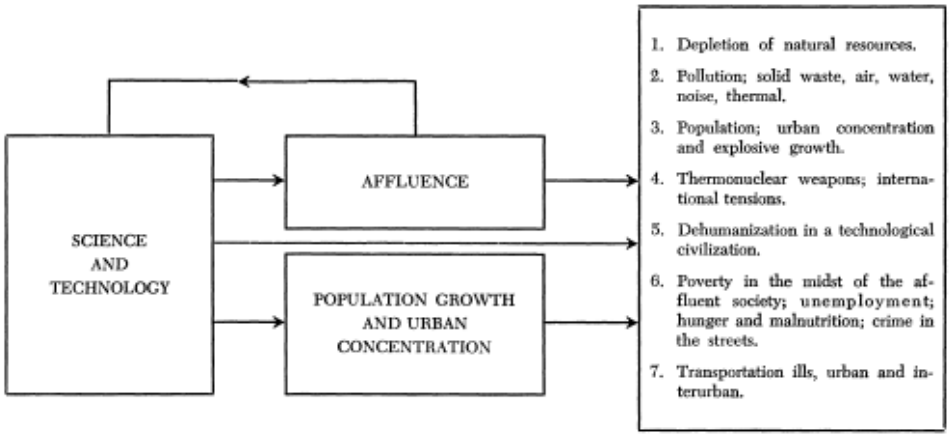
iii. Educational Reform and Curriculum Movement

1. Interdisciplinarity
   a. "Education today is suffering from a disciplinary hangover" (David & Truxall, 1971, p. 924)
   b. This statement, heard widely in one form or another, refers to the traditional divisions of education into physical sciences, life sciences, social sciences, humanities, arts, and their usual subdivisions. These distinctions are leftovers from the time of education for the few who were to fill a narrow and select spectrum of society. Universal education must prepare students for a much broader variety of roles, and must do so while maintaining a mutually shared culture. Over the years, there have been attempts at "comprehensive" and "interdisciplinary" education for such purposes, but these have generally fallen by the wayside because their values proved transient or superficial.

2. National Defense Education Act (NDEA) Funding (1958-): The Congress hereby finds and declares that the security of the Nation requires the fullest development of the mental resources and technical skills of its young men and women. The present emergency demands that additional and more adequate educational opportunities be made available. The defense of this Nation depends upon the mastery of modern techniques developed from complex scientific principles. It depends as well upon the discovery and development of new principles, new techniques, and new knowledge. We must increase our efforts to identify and educate more of the talent of our Nation…. correct as rapidly as possible the existing imbalances in our educational programs which have led to an insufficient proportion of our population educated in science, mathematics, and modern foreign languages and trained in technology. (p. 1581)
    a. Harvard Case Histories in Experimental Science (1946-)
        i. *On Understanding Science: An Historical Approach*, Conant (1947/1951, p. 16): Let me now be specific as to my proposal for the reform of the scientific education of the layman. What I propose is the establishment of one or more courses at the college level on the Tactics and Strategy of Science. The objective would be to give a greater degree of understanding of science by the close study of a relatively few historical examples of the development of science. I suggest courses at the college level, for I do not believe they could be introduced earlier in a student's education; but there is no reason why they could not become important parts of programs of adult education. Indeed, such courses might well prove particularly suitable for older groups of men and women.
        ii. Shirley (1951, p. 423): The Harvard goal is integration of the humanistic, social, and scientific knowledge into a logical and coherent pattern which will be of real value to the citizen of to-day and to-morrow.
        iii. Bryant (1948/1957, p. ix): The purpose of the case histories presented in this series is to assist the reader in recapturing the experience of those who once participated in exciting events in scientific history. The study of a case may be to some degree the equivalent of the magical operation suggested in the preceding paragraph, namely, that of transporting an uninformed layman to the scene of a revolutionary advance in science.
    b. Physical Science Study Committee (1956-)
    c. Biological Sciences Curriculum Study (1958-)
    d. Harvard Project Physics (1962-)
    e. Engineering Concepts Curriculum Project (1963-)
        i. Liao & Piel (1970, p. 74): It is not designed primarily for future majors in science or engineering, nor was it developed to proselytize students into engineering careers. Rather it is a course designed to familiarize students with certain concepts which pervade modem technology.
        ii. "An innovative course designed in 1963 by the Commission on Engineering Education to teach high school students the basics of engineering and encourage them to consider the

field as a future profession. Eventually called *The Man-Made World*, the aims of the course were to develop student technical literacy and show how technology and applied mathematics had benefitted society. Put together by a group of secondary school science teachers, engineers, college professors and scientists, *The Man-Made World* was divided into three parts: Logic and Computers, Models and Measurement, and Energy and Control. Funded by the NATIONAL SCIENCE FOUNDATION and such corporations as Exxon, U.S. Steel and McGraw-Hill Publishing Co., the course provided schools with appropriate textbooks, teacher manuals, tests, film strips, transparencies, audiotapes, games and laboratory equipment. Administered by an ECCP staff at the State University of New York at Stony Brook, the course was a precursor of the technology courses that subsequently permeated the elementary and secondary school science curricula across the United States." http://american-education.org/779-engineering-concepts-curriculum-project-eccp.html

f. Man: A Course of Study (MACOS) (1964-)
g. Science, Technology and Society (1969)
    i. Cunningham (1971, p. 215): In a discussion period following one of these sessions in 1966 our Provost challenged me. "You paint a bleak Orwellian picture of man overpowered by his own creation—what should we do about it at Penn State?" Unfortunately, I didn't have a ready answer. Events in the past four years, including campus turmoil, now clearly indicate, I believe, an urgent need for curricular recognition of the impact of science and technology on society—the "STS issue," in short.



    ii. Ina Susanne Spiegel-Rosing & Derek de Sola Price, *Science, Technology and Society: A Cross-Disciplinary Perspective* (Beverly Hills: Sage, 1977).
    iii. *Science/Technology/Society as Reform in Science Education*, Yager (1996)

iv. Academic and Institutional Program

1. Michigan State University (1958): The first part of the course of study is devoted to a brief history of the relations between science, technology, and society; for, as Sarton has said, science is the central thread along which may be traced the biography of mankind. The purpose of this part is to aid in identifying major trends and causes in the relationships mentioned and not merely to accumulate facts concerning the discoveries and inventions of the past. Although much remains to be done in providing appropriate books, a number of good sources are even now available to provide this necessary background. (Stewart, 1958. p. 221)
2. Cornell University, Program on Science, Technology and Society (1969)
    a. Bowers et al. (1971): Cornell's Interdisciplinary Program on Science, Technology and Society, whose activities are sup ported by funds from NSF, the Alfred P. Sloan Foundation, the Henry Luce Foundation, and Cornell University. The program, which was established in the summer of 1969 to stimulate teaching and research on the interaction of science and technology with society, draws its students, faculty, and research workers from all areas of the university, including the natural and social sciences, engineering, business and public administration, and law.
3. Penn State University, Science, Technology and Society Program (1969)
4. Stanford University, Program in Values, Technology, Science, and Society (VTSS) (1971/1976)
5. Lehigh University, Humanities Perspectives on Technology (1972)
    a. "create educational experiences which bring humanistic perspective to the application and evaluation of technology."
6. MIT, Program in Science, Technology and Society (1977)
    a. "to explore the influence of social, political and cultural forces on science and technology, and to examine the impact of technologies and scientific ideas on people's lives."
7. *Bulletin of Science, Technology & Society* (1981)

e. Science and Technology Studies (STS)
    i. Science, Technology & Society programs
    ii. Oxford (1972): Wellcome Unit for the History of Medicine.
    iii. Founding of 4S (Spring 1976): A Society for the Social Studies of Science has been organized to encourage social studies of science and technology. Officers and Council of the new Society are: Robert K. Merton, President; Robert McGinnes, Secretary-Treasurer; and Council members: Bernard Barber, Nelson Polsby, Nicholas Mullins, Arnold Thackray and Derek de Solla Price. The first annual meeting of the Society will be held on October 29 to 31 at Cornell University, Ithaca, New York. Membership dues for the Society are $10.00 annually; student dues are $5.00. For further information contact Robert McGinnes, Society for the Social Studies of Science, Department of Sociology, 323 Uris Hall, Cornell University, Ithaca, New York 14850.
    iv. *Newsletter on Science, Technology, & Human Values* (October 1976)
    v. Science & Technology Studies: University of British Columbia (October 1976):

> A Committee on Science & Technology Studies has been created at the University of British Columbia. Membership in the group is open to all those professionally engaged in these studies--conventionally identified as history, philosophy, sociology of science or technology, science and culture studies, science policy studies and so forth. It is open as well to all those interested in such studies, to practitioners of natural, social and

human sciences, and their associated "applied sciences" such as medicine and engineering.

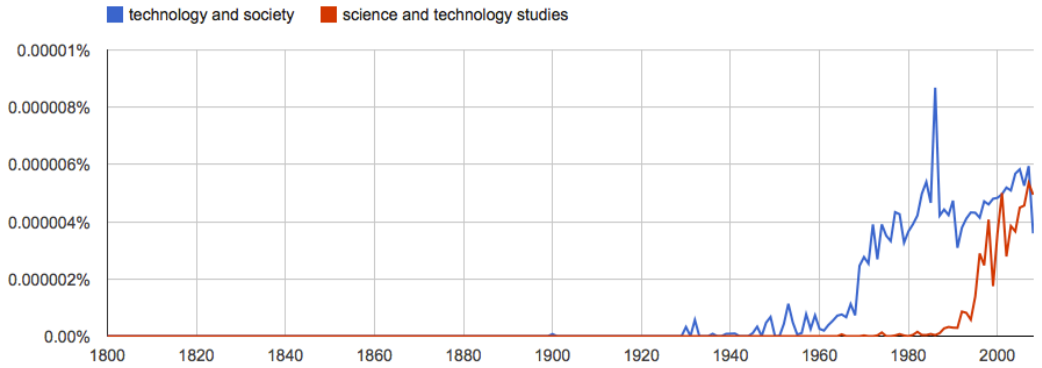
The Committee plans to: organize workshops, lecture-series and seminars; act as a coordinating center for science and technology studies; establish a resource center; develop team-taught interdisciplinary courses of study; and serve as a consulting group to units of the University that wish to develop courses in this area.

For details, contact Stephen Straker, Department of History, or Robert Anderson, Faculty of Applied Science, University of British Columbia, Vancouver 8, British Columbia, Canada.

vi. "**Science and Technology Studies-Toronto 80**," the joint annual meetings of the History of Science Society, Philosophy of Science Association, Society for the History of Technology, and Society for the Social Studies of Science, held in Toronto, Canada, 16-19 October 1980.

vii. Bowker & Latour (1987): We could have written a country [France] report that would have focused only on what Anglo-Saxons choose to call STS. It would have been a sad, bleak report…. We are used to French intellectuals appearing in the wings (when they do appear) as radical troublers of existing order: from Sartre and de Beauvoir through Althusser and Foucault to Derrida and Baudrillard, they engage in a moral and political discourse that denies the neutrality of the most harmless phrase and sees power plays in the slightest gesture. Yet when science appears, these iconoclastic figureheads gather behind its banner. In the course of this paper we will see the most sociologizing of sociologists (Pierre Bourdieu) and the most historicizing of historical schools (the Annalists) define science as something somehow apart from society and history.

Thus if we tried to produce an article on the field of the social study of science as defined by Anglo-Saxons, we would immediately find much to surprise: it 'should' be booming, and attached to critical sociology and philosophy; it is languishing, and attached to positivism.



f. Low Church STS – High Church STS

i. Steve Fuller (1993, 1997, 1999): About five years ago, I coined the "High Church-Low Church" distinction to capture two rather different ways of conceptualizing the trajectory of something called "STS"[1]. In High Church terms, "STS" means "Science & Technology Studies," an emerging academic discipline that uses the methods of the humanities and the social sciences to study mainly the natural sciences but increasingly technology. In Low Church terms, "STS" means

"Science, Technology & Society," a nascent social movement that has been historically promoted by science and engineering teachers concerned with the social implications of mainly technology but increasingly science. There is probably a broad political consensus between the High and Low Churches regarding a generally critical attitude toward the role of science and technology in society today. However, the High Church stresses the need for more research to understand the complexities of that role, whereas the Low Church wishes to reduce some of those complexities by reorienting science and engineering education. Consequently, the two Churches of STS inhabit rather different professional societies and represent themselves in rather different ways, though often drawing from many of the same intellectual traditions.

ii. Asquith (1981): First, the initials "STS" for the non-science component of the [Michigan State University] Briggs curriculum stand for "Science and Technology Studies" not, as is often the case, "Science, Technology, and Society." This name reflects the belief held by the developers of the Briggs' curriculum that analysis of the social and cultural roles played by science and technology involves the presupposition of views about the nature of scientific and technological knowledge and that an historically-informed perspective will increase sensitivity to the ways knowledge or devices can impact on human activities. Consequently, history and philosophy of both science and technology are included as integral parts of the program.

iii. Winner (1996, p. 87): On the whole, however, the development of science and technology studies in the 1980s flowed with the depoliticizing tides of that decade. As reflected in the yearly meetings of the Society for Social Studies of Science, many scholars were content to discuss such things as the social construction of the bicycle during the late nineteenth century rather than, say, the rapid dismantling of industrial workplaces shattering the lives of so many of their contemporaries.

g. “The Third Wave of Science Studies: Studies of Expertise and Experience” (Collins & Evans, 2002):

The First Wave of Science Studies

To simplify outrageously, let us say that there was once what seemed to many to be a golden age before 'the expertise problem' raised its head. In the 1950s and 1960s, social analysts generally aimed at understanding, explaining and effectively reinforcing the success of the sciences, rather than questioning their basis.7 In those days, for social scientists and public alike, a good scientific training was seen to put a person in a position to speak with authority and decisiveness in their own field, and often in other fields too. Because the sciences were thought of as esoteric as well as authoritative, it was inconceivable that decision-making in matters that involved science and technology could travel in any other direction than from the top down. This wave of 'positivism' began to run into shallow academic waters in the late 1960s with Thomas Kuhn's book and all that followed. By the end of the 1970s, as an academic movement, it had crashed on to the shore.

The Second Wave of Science Studies

The following wave of science studies, which has run from the early 1970s, and continues to run today, is often referred to as 'social constructivism', although it has many labels and many variants. One important variant is the sociology of scientific knowledge (SSK). What has been shown under Wave Two is that it is necessary to draw on 'extra-scientific factors' to bring about the closure of scientific and technical debates - scientific method, experiments, observations, and theories are not enough. With science reconceptualized as a

social activity, science studies has directed attention to the uses of scientific knowledge in social institutions such as courts of law, schools, and policy processes such as public inquiries. The emphasis on the 'social construction' of science has meant, however, that when expertise is discussed, the focus is often on the attribution of the label 'expert', and on the way the locus of legitimated expertise is made to move between institutions.

SEE [Studies of Expertise and Experience], the **Third Wave of Science Studies**, is one approach…. the Third Wave of Science Studies must emphasize the role of expertise as an analyst's category as well as an actor's category, and this will allow prescriptive, rather than merely descriptive, statements about the role of expertise in the public sphere.

h. Science Wars
    i. Gross and Levitt (1994/1995): *Higher Superstition*
        1. The thinkers we examine are by no means obscure or peripheral to the academic left's assault upon science. Most of them are VIPs in academia and some are public figures as well. All have published widely read work on the subject (although occasionally we shall concentrate on a more obscure paper or a recent, as-yet-unpublished lecture). To exemplify cultural constructivism, we have chosen sociologists and historians of science: Stanley Aronowitz, Bruno Latour, Steven Shapin and Simon Schaffer. For postmodernism, we have settled upon the philosopher Steven Best, the "cultural critic" Andrew Ross, and the literary critic N. Katherine Hayles. The feminist theorists we consider include some of the best known: Sandra Harding, Donna Haraway, Evelyn Fox Keller, Helen Longino. As for the radical environmentalist attack on science, we concentrate on academics like Carolyn Merchant.
        2. we cannot avoid citing the work of Bruno Latour, a sociologist, anthropologist, and social philosopher whose work on science as social practice has been as much of an inspiration to the constructivist camp as that of Thomas Kuhn. In contrast to Kuhn, however, this does not reflect any inadvertence on Latour's part. He clearly relishes his role as self-appointed heretic and gadfly. His reputation and the substance of his claims rest on his record as an "anthropologist" of science, who does fieldwork at research facilities rather than among the denizens of New Guinea. He is not loath to let it be known that he has brought back amazing tales from his sojourn among the troglodytes. He claims, with no particular modesty, to be the first modern thinker to discover what scientists actually do, as opposed to what they say they do or think they do. His tools are those of the microsociologist; in his primary research he concentrates on small groups and personal interactions in which quirks, prejudices, and local hierarchies obviously playa role…. Notwithstanding the specificity and locality of his direct investigations, Latour is eager to emerge with far reaching generalizations and epistemological laws. These are embedded in an expository style as unconventional as the theses it propounds. His major work, *Science in Action*, is studded with aphorisms, diagrams, cartoons, and doodles, and is characterized by a mercurial, gnomic wit; but his purpose is seriously iconoclastic. Here, for instance, is his "Third Rule of Method": "Since the settlement of a controversy is the Cause of Nature's representation, not the consequence, we can never use the outcome Nature to explain how and why a controversy has been settled. This would seem to be an instance of unbending relativism and antirealism.

3. Latour's picture of science is bleak and ominous: a war of all against all! Science is presented as a savage brawl in which, from day to day, the dominant chieftain is he who assembles, by dint of wealth, prestige, and warrior cunning, the biggest and nastiest gang of henchmen (i. e., a "network," in Latour's parlance.

ii. New York Academy of Sciences, "The Flight from Science and Reason," conference, 1995

iii. Sokal Hoax (1996): "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity" in *Social Text*

iv. "The Gloves Come off: Shattered Alliances in Science and Technology Studies," Winner (1996, p. 81): But for those who have followed the development of science and technology studies (STS) over the years, it has been obvious that eventually the other shoe would drop, that someday it would occur to scientists and technologists to ask: Why do the descriptions of our enterprise offered by social scientists and humanists differ so greatly from ones we ourselves prefer? How much longer should we put up with this?

v. "The Science Wars: Responses to a Marriage Failed," Nelkin (1996, p. 94): The theme is loud and clear. Science is being defiled and debased by uninformed outsiders-including radical feminists, postmodernists, humanists, literary intellectuals, socialists, anthropologists, environmentalists, creationists, animal-rights activists, and the president of the Czech Republic, Vaclav Havel. Havel, in a public speech in Philadelphia in 1994, had suggested there was "a crisis in science as the basis of the modern conception of the world"; that the premise of science, its unconditional faith in objective reality, had failed to grasp "the spirit, purpose, and meaning of the system." He and other intellectuals who suggest the limits of science have been defined as enemies bent on destroying science and undermining the scientific worldview. Science is bedeviled, besmirched, and besieged. This is the sort of protectionist language that anthropologist Mary Douglas calls "pollution rhetoric"-the typically defensive response of endangered institutions that seek to seal their doors in an effort to pre- serve their purity and security in the face of external intrusion.

vi. "The Science Wars: A Dialogue," Latour (2002):

1. **She:** So you're a sociologist and you do research on scientists? Well, then you can explain something to me. People in my lab are forever talking about the "Science Wars." What's all the fuss about?
2. **He:** If only I knew! I'd know what front to fight on, what equipment to carry, and what camouflage to wear. As things are, people are firing in all directions. It isn't easy to know what's going on.

vii. "Why Has Critique Run Out of Steam?," Latour (2004, p. 225): Wars. So many wars. Wars outside and wars inside. Cultural wars, science wars, and wars against terrorism. Wars against poverty and wars against the poor. Wars against ignorance and wars out of ignorance. My question is simple: Should we be at war, too, we, the scholars, the intellectuals? Is it really our duty to add fresh ruins to fields of ruins? Is it really the task of the humanities to add deconstruction to destruction? More iconoclasm to iconoclasm? What has become of the critical spirit? Has it run out of steam?

viii. *War of Worlds*, Latour (2002, p. 20): The slogan invented by journalists a few years ago has been well chosen: "Science Wars" are taking place. What looked at first like a tempest in a teacup has revealed itself as the tiny tell tale sign of a much larger transformation. One way to sum up this sea change is to say that modernity, which had been conceived as the filling up of the world with ever more matters of fact, is now full of what I would like to call states of affairs.).