
STS and the Environment: The 1970s and Now¹

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Abstract

The paper traces the history of STS research and teaching from its radical origins in the 1970s to the present. After a slight lull in the 1980s, Science and Technology Studies again gained momentum in the 1990s. It re-emerged as an academic discipline without the radical cutting edge of former activist movements and shifted from local pollution issues to global environmental concerns. The development of STS and the concomitant changes of attitude are illustrated by the situation in Japan over the past 30 years.

SISCON in the early 1970s

STS is the abbreviation for 'Science, Technology and Society' (or more recently 'Science and Technology Studies'). It came into being in the 1970s as a result of the British teachers' movement 'to teach science in its social context' (a message abbreviated as SISCON). This was, for example, to be accomplished by teaching atomic physics in the context of the atomic bomb and nuclear reactors. The teachers prepared yellow-covered teaching resources about the philosophical nature and social impact of science. The movement was led by Dr. Bill Williams of Leeds University (Solomon 1996).

Although John Ziman attended the STS meetings, most of the participants were teachers rather than scholars. I once participated in their annual meeting in London in the 1970s and found that they tended to speak with a heavy Cockney accent rather than the Oxbridge English that I was more familiar with. They were mostly teachers affiliated with polytechnic schools, which had lower-class origins, in contrast to high-science Cambridge. The teachers sought to introduce SISCON or STS into high-school teaching. Their ideology was radically critical of the

establishment, if not subversive. Whether or not the teaching of STS could be maintained at secondary schools depended on the extent to which STS teachers could get along with traditional science teachers who tended to consider social concerns as being totally unnecessary for teaching science.

There were some other radical trends in the same vein in the technologically advanced Western countries in Europe and North America, as well as Japan, Australia and New Zealand. All these trends can be traced to the late 1960s. To be more specific, 1968. Some people have dubbed it the '1968 Revolution', perhaps inspired by the 1968 Paris Revolution.

The resources teachers used were not original writings but rather a collection of works in the area of 'Science, Technology and Society' as it was later called. They claimed that their movement emerged in response to the second edition of Thomas Kuhn's *The Structure of Scientific Revolutions* (second edition, 1970). In hindsight, it is rather difficult to directly relate Kuhn to the STS movement, but it was a time when Kuhn was a symbol of the anti-establishment movement and the revolution, together with Marcuse (Conant & Haugeland 2000, 308).

STS research in the 1970s

Apart from STS education, there was a group of people who were interested in research in STS among historians of science. 1968 was also the year when the XIIth General Assembly of IUHPOS (International Union of the History and Philosophy of Science) dispatched a resolution concerning the Czechoslovakia Incident. A provisional Commission was formed to consider the desirability of creating a special Division of History for the Study of Science in Its Social Context. This division was later used to encompass areas subsequently known as 'science studies', 'social studies of science', and 'Wissenschaftsforschung' (MacLeod 1975, 318 ff.).

The historians formally organised the International Council of Science Policy Studies within the International Union of the History of Science in Tokyo in 1974. The founding members were Derek Price, Everett Mendelsohn, A. Rahman and myself. Price became the founding president. At the time of the founding assembly in Tokyo, Joseph

Needham, Thomas Kuhn and other well-known scholars joined. We would have liked to name it STS at the time but in order to be able to extend invitations to academics from socialist countries, the words 'science policy' were deemed to be more suitable.

The activities of the Council had declined by the time of the fall of the Berlin Wall. The next generation who were in their prime at the time of the '1968 Revolution', developed a new way of looking at science and the world. Like the SISCO movement that preceded it, various informal groups of STS activists emerged in the 1970s. Their activities were sufficiently mature to support an entire academic discipline with its own academic journal *The Social Studies of Science*. The journal was founded in 1971 and was originally known as *Science Studies*. 4S (Society for the Social Studies of Science) was organised in 1975 and EASST (European Association for the Studies of Science and Technology) followed in 1981.

Institutionally, the new way of looking at science could be seen in the change of names of departments from 'Department for the History and Philosophy of Science' to 'History and Sociology of Science', as happened at the University of Pennsylvania in 1976. This change also occurred at the Universities of New South Wales and Wollongong in Australia. This change can, in a sense, be interpreted in the following way. The Philosophy of Science in the Western world was often seen as a discipline that sought to prove and establish the philosophical basis of the objectivity of modern science. This was partly motivated by the desire to support the ideology of modern Western science as opposed to Nazi and Marxist science. With Kuhn's book (especially the second edition), the Kuhnian sociology of science appeared which seemed to advocate relativistic and pluralistic approaches to science.

The more academic expression 'Science and Technology Studies' rather than the activist language of 'Science, Technology and Society' was institutionally supported in the 1970s here and there. For instance, the Cornell program of STS (Department of Science and Technology Studies) was one of the earliest attempts to offer PhDs in the discipline. MIT and other institutions established graduate courses, research projects and undergraduate general education courses in STS, making it an integral part of the academic sector.

STS is, in my opinion, an area of inquiry where various problems are raised rather than a field dominated by a specific disciplinary method or paradigm. I wrote *Kagaku to shakai no gendaishi* (A Contemporary History of Science and Society, 1981) to deal with what happened in the decade after 1968. It is difficult to find a single cause of the '1968 Revolution' that was shared by all advanced industrialised countries. One of the common problems was that when post-war baby boomers reached college age, the university system was not well prepared for mass higher education and the discomfort and complaints on the part of students erupted in the form of campus riots. Another cause may be said to be that post-war industrial development reached a point where it had created worsening pollution and other problems for the general public. People started questioning the ideology of modern science, which had so far been dominant.

Most of the STS-related problems that appeared in the early half of the decade were discussed in my book. Radical anti-establishment student movements emerged in advanced countries. The situation was particularly serious in the US, where students who were drafted for the Vietnam War had difficulty finding any rationale for their participation in the war. The anti-war and anti-nuclear movements criticised modern technology and its military implications in the Cold War environment.

People questioned the values of industrialised society. The anti-pollution movement followed. Technology assessment was one of the responses from the establishment side. This was followed by the emergence of environmental thought, critical science, the promotion of alternative technology, alternative energy, organic farming and alternative medicine. The Great Cultural Revolution in China was interpreted by intellectuals in advanced industrialised countries as the claim of anti-professionalism. A climate in the Third World was fostered in the 1970s where appropriate technology was promoted, and bare-foot doctors were common.

The influence of the '1968 Revolution' did not immediately reach the Third World, for they had their own more urgent problems, such as military dictatorships and the neglect of human rights. But as they sought to emulate models of development of more advanced countries, they quickly took up the STS problematique. My book was translated into Korean during the military government days. I was wondering how

it could be possible, since my writing and the area of STS involved taking a critical stance with regard to various issues. According to Prof. Song Sang-Yong, it represented an early manifestation of the democratisation movement, which sought to resist the military dictatorship.

From pollution to environment

In the 1980s, there was less STS activity but in the 1990s, the field experienced more vigour in a slightly different form. What emerged was an academic discipline that lost the radical cutting edge of activist movements. All of the elements that appeared in the ideology of the 1970s were now conflated into 'global environmentalism' in the 1990s. One interpretation of what occurred is that those radicals who started STS in the 1970s found tenure-track academic positions in universities and started to nurture the next generation of academically trained STS scholars, who were able to find a regular place to present their scholarship in academia.

Pollution and environmental problems were common to advanced industrial countries, as the capacity of human power to destroy nature increased. Out of a number of problems and issues that appeared in the early 1970s, environmental issues were the most widespread and long-lasting issues. Industrial pollution was most clearly seen in Japan, where many problems emerged after a phenomenal period of high economic growth in the 1960s. By the 1970s, Japan had the highest density of industry, energy use, and population of any nation (Broadbent 1998, 12 ff.) and unfortunately, also pollution. Let us next trace the change in attitude towards pollution and environmentalism in Japan.

From the outset, *Kôgai* (literally, public nuisance, meaning pollution) was one of the major subjects of STS in Japan. 1970 was the turning point of Japanese industrial policy. Prior to this, during the high economic growth period of the 1960s, the business sector encouraged the public sector to adopt pro-industrial policies. The academic sector trained increased numbers of scientists and engineers to meet industrial needs. And finally, more parents sent their sons and daughters to engineering

schools in the hope of securing their futures. The flow of influence went from business to government to academia and finally reached the grass-roots sector.

In 1970, however, the trend was entirely reversed. Many horrific incidents of pollution stirred the public to action. Environmental movements helped elect a wave of left-wing mayors and governors. Academics started working on detecting the source of pollution, identifying suspect corporations and putting pressure on them. The national parliament known as the Diet established the Environment Agency to monitor industrial pollution. Finally, the industrial sector invested heavily in pollution control equipment (Broadbent 1998, 37).

The word 'kôgai' became known throughout the world as the Japanese Minamata case came to international attention, around the time of the 1972 Stockholm Declaration. Japan was recognised as one of the most 'advanced' polluted countries. The case of Minamata mercury poisoning, where the pollution could be traced to a corporation, was seen as typical of the problems that the private sector could cause. The victims and radical militant supporters, most of them ex-student radicals, worked together with victims to change the trend and even the value system of Japan in those days. Young anti-pollution activists from all over the world came to Japan to observe Minamata and stayed there to participate in the campaign to rescue victims.

While the peak of the anti-pollution movement was reached in the early 1970s, activity declined in the 1980s. Countermeasures to prevent pollution showed their effectiveness in industrialised countries. In the US, 'the Reagan counterrevolution' took place against the backdrop of the environmental innovations of the 1970s (M.K. Theodore & L. Theodore 1996, 17). The influence of the Green Party gradually declined in the 1980s.

Throughout the 1970s, measures to prevent pollution were to some extent achieved in Japan. Desulphurization met with considerable success. As early enthusiasm gradually faded, the mass media lost interest in pollution issues. In academia, a number of new departments of environmental science were founded. But over the course of time they were disappointing, as they did not succeed in establishing their own unique paradigm and thus failed to constitute an independent discipline. Many new departments

were disbanded in the early 1980s. Local government took the lead by establishing research laboratories to fight pollution. Pollution was seen more as a local matter rather than a nation-wide problem to be researched by national laboratories or to be studied by academic scientists.

Another new wave arose in the late 1980s, however. This was called the 'chikyû kankyô' movement (movement for global environmental problems). At the summit meeting of G7 in late 80s, Mikhail Gorbachev tried to raise the topic of global environmental issues to replace the Cold War problems that were then fading. The political leaders who returned home from G7 were ordered to seriously take up global environmental issues so that their nations could win prestige in the international competition to come up with environmental initiatives. Japanese Prime Minister, Takeshita, who was by no means environmentally concerned, returned from the summit conference and suddenly decided to create a global environmental policy for Japan. Accordingly, the Japanese National Pollution Laboratory changed its name to the National Laboratory for the Environment. Such a global subject was better suited to a national laboratory rather than a local pollution laboratory. Such actions were examples of a top-down approach as opposed to bottom-up policies that had been typical of the pollution issues in the 1970s.

The business sector welcomed the emergence of the environment as a global issue as it had little to do with the misconduct of specific industries. Business cooperated with the government, and policy encouraged corporate voluntary effort and the attainment of the ISO 14000 series of industrial environmentalism in order to accord with their 'earth-friendly' policy.

In the beginning, the academic sector was sceptical about climatic change and its grave social consequences but soon a consensus emerged that more research was necessary. It was, for example, still questionable whether global warming was universally proven.

Grassroots activists, who had fought for the community and participated in consumer movements, were puzzled as to what they could do to protect the global ecology. They had a slogan of 'think globally, act locally' but it was not clear how they could prevent global environmental problems that were removed from their own life environments. Leaders of the anti-pollution movement suspected that it was a governmental

plot to turn people's critical eyes to something big and irrelevant. In the course of time, however, they realised that the destructive power of humankind now extended from the local to the global level.

There followed two important epoch-making events. One was the 1992 Brazil summit, where NGOs appeared as the radical promoters of global environmental causes. Another was the meeting of the third session of the Conference of the Parties to the UNFCCC (COP3) in Kyoto in December 1997 from which the Kyoto Protocol emerged. Both events highlighted the activities of environmental NGOs on the news media.

In the meantime, the quality of movement supporters has changed. In the 1970s radical students went out to the community and helped the victims of pollution. They tried to identify the source of pollution at specific sites, started lawsuits in the courts on behalf of victims and in most cases won throughout the 1970s. On the other hand, in the 1990s, student movements were less powerful but members diffused into the larger community to act as volunteers and to join NGOs. They were more knowledgeable thanks to the diffusion of STS research and teaching. They were less concerned about the specific cause but had a broader global perspective and utilised communication tools of the Internet and frequented international conventions. They were less militant and often cooperated with government and industry.

We can contrast Japanese issues of the 1970s and 1990s in the following way:

Table 1.

Period	early 1970s	early 1990s
Catch-word	pollution	global environment
Movement	bottom-up	top-down
Issues	local	global
Activists	victim, student radicals	NGO, volunteer
Target, site	corporations, law court	international convention
Research, site	local government laboratory	national institute

Recycling

There was some abrupt discrepancy between the above two phases, the 1970s and 1990s. Those activists who had fought for the environmental cause in the earlier phase were suspicious at the time of transition that industrial polluters intentionally hid their vice under the pretext of global environment. Whether hidden or not, it is true that the local pollution was gradually replaced by a more global concern for the environment over the course of time.

We may find something in the recycling movement that links the pollution and global environment generations, the two distinctive groups of the 1970s and 1990s. In an IT society, production becomes cheaper as numerically-controlled machine tools and robotics become widely practised while the collection of disposed waste remains labour-intensive and hence becomes increasingly costly. Thus, waste disposal and recycling becomes everybody's concern.

In conclusion, my understanding of STS is not as a field with a consistent methodology but as a problem area. Accordingly, STS deals with different topics from different perspectives in an ever-changing world. In the 1970s, concerned scientists and citizenry were urged to consider the serious effects of war, pollution, and the energy crisis; STS was expected to meet such pressing needs. In the 1990s, STS took up problems of global ecology from a global perspective while the recycling thought became firmly rooted, thus achieving a wider audience for STS-related topics amongst students and citizens.

Note

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References

- Broadbent, J. (1998), *Environmental Politics in Japan: Networks of Power and Protest*, Cambridge: Cambridge University Press.

- Kuhn, T.S. with J. Conant, and J. Haugeland, J. (Eds.) (2000), *The Road Since Structure: Philosophical Essays, 1970-1993, with Autobiographical Interview*, Chicago: University of Chicago Press.
- MacLeod, R.M. (1975), 'The Historical Context of the International Council for Science Policy Studies', *Archives International d'Histoires des Sciences* 25 (97): 318 ff.
- Solomon, J. (1996), 'STS in Britain: Science in A Social Context', in R.E. Yeager (Ed.), *Science/Technology/Society As Reform in Science Education*, Albany: State University of New York.
- Theodore, M.K., and L. Theodore (1996), *Major Environmental Issues Facing the 21st Century*, Upper Saddle River: Prentice Hall.