An Extended Introduction to a Reconsideration of the Relationship between STS and Philosophy of Science

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This research note is an extented introduction of my earlier paper published in Taiwan's STM Journal in 2013, which reconsiders the relationship between STS and philosophy of science. First it tries to understand the relationship by comparing their respective relationships to science. If, as joke has it, philosophy of science to science is just like meteorology to meteors, then what is STS to science like? It turns out that their respective relationships to science are much more complicated and sophisticated. STSers also have to reply to that joke first intended for philosophers of science. Secondly, instead of constructing a safe and diplomatic trading zone for exchanging ideas between STS and philosophy of science, this paper suggests some more radical and perhaps more fruitful strategies, whose lessons are drawn from two mini-case studies. One is about how a philosopher of technology (Langdon Winner) criticizes and yet in different contexts appropriates or even promotes STS, and the other is about how one of the founders of SSK (David Bloor) skillfully appropriates philosophy of mathematics and even tries to convert some of its major players (e.g., Imre Lakatos). This paper ends with a critical discussion with a Taiwanese philosopher of science (Chen Ruey-Lin) about why philosophy of science is not a necessary condition for the conceptual developments of STS, but sometimes it can do more than simply a necessary condition.

【Key words】Langdon Winner, David Bloor, Imre Lakatos, Between philosophy of science and STS, Boundary-crossings

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This extended Introduction is for a published Chinese paper[1] of mine which owes part of its origin to my earlier visit and invited talk[2] to the Annual Meeting of Korean Society for Philosophy of Science (KSPS) in 2008, Jeju Island. As a practising STSer and a former philosopher of science in Taiwan, I was then inspired to learn the scope and breadth of KSPS, which is much wider than those of Taiwan's small community of philosophy of science. Hence I am very pleased to write this Extended Introduction, to be published in a special issue on philosophy of science and STS in *Korean Journal of Philosophy of Science*.

This paper reconsiders the relationship between STS and philosophy of science. It consists of two approaches: one is to make a comparative understanding, and the other is to do two mini-case studies. My first approach is to understand that relationship by comparing their respective connections to science itself. If, as a scientist's joke has it, **philosophy of science to science is just like meteorology to meteors**, then we have also to ask a symmetrical question: what is STS' connection to science like? It turns out that their respective connections to science are much more complicated and sophisticated.

Due to the earlier Quinian slogan of naturalizing epistemology, philosophy (of science) aspires to become a part of science itself, or at least to be continuous with science. Thus in order to do good philosophy of science, more and more philosophers aim to master the most recent branches of science, as we can attest from serious works in areas of philosophy of physics, philosophy of evolutionary biology, or that of cognitive science, of computer science and so on. Mastering the

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[1] Fu (2013), pp. 49-102.

[2] I should thank specifically to Professor Yi Sang Wook for his kind invitation.

most recent branches of science is not easy on the part of philosophers of science, and usually hard works and long time would be spent on that. As a result, close communication or even cooperation in writing research papers between philosophers and scientists are practices more frequent nowadays. Even if this major trend seems a bit alienated, or even fragmented from the classical ideals of philosophy of science in Popper, Lakatos or even in Kuhn, philosophy of science to science is probably not like meteorology to meteors any more.

On the other hand, what is STS' connection to science like? Unlike philosophy, which in earlier times aspires to engage in a transcendental evaluation of science or nowadays likes to be continuous with sciences, STS as I understand it aspires to neither of them. STS is more social and historical than philosophy of science. Very roughly, in addition to show the social and historical constructions of science, STS aspires to engage in a social critique of science, to provide advices concerning the educational, policy formational, environmental, and perhaps ethical aspects of science and technology. However, to ask a question symmetrical to philosophy of science, how is STS to science not like meteorology to meteors? Or in what sense that STS understands science well enough so that its social critique of science is not just another form of "populism" as had been charged by some scientists in the Science War era? Of course, STS is often proud of its detailed "case studies" of science so that STS is sometimes considered more concrete, material, and specific in science matters than philosophy of science. But this is not good enough. As been recently proposed in their studies of "expertise" by STSers like Harry Collins and Peter Evans[3], STSers need to become an "interactional expert" in the case study he or she engages. Meaning you have to be knowledgeable, intellectually interesting and fluent in conversation with practising scientists in your case study. Just

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[3] Collins and Evans (2002), pp. 235-96.

like the situation in a Turing test, a practising scientist could not tell whether the talking person behind the screen is a real scientist or an interactional expert (a good enough STSer here). Indeed it takes a lot to become a STS interactional expert, a certain kind of expert in meteors, not merely a "critical meteorologist" on meteors.

My second approach to the relationship between philosophy of science and STS in this paper is to reconsider the various ways how STSer and philosopher of science can understand or learn from each other. Let me first consider certain problems and recent proposals. In a recent interview[4] of David Bloor, one of the originators of SSK, in identifying "an academic group who should have been, but have not been, receptive to sociological ideas," he spoke bitterly that "There are some **shining exceptions** but in general there has been a routine and dismissive hostility from this quarter [i.e., philosophy of science] with no serious attempt to come to terms with work in the sociology of knowledge."[5] Joseph Rouse, on the other hand, reminds us in an article[6] of "An unrecognized convergence" between philosophy of science and science studies. In quoting Sharon Traweek, Rouse urges us construct a diplomatic "trading zone" for exchanging ideas between STS and philosophy of science: "we be more conscious of the limits of our little terrains so that we occasionally can, **with proper visas, passports and adapter plugs**, learn to cross these borders to discuss our different versions of ⋯our shared concerns"[7]. Chen Ruey-Lin, a noted Taiwanese philosopher of science and STSer, had also proposed another more philosophical line of thought.[8] Chen believes that earlier commentators

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4) Li, et. al. (2010), pp. 419-32.

5) Ibid., p. 428.

6) Rouse (2011), pp. 11-26.

7) Ibid., p. 23.

8) Chen (2011), pp. 24-48.

had misunderstood the relationship between philosophy of science and STS. Actually, if we pay enough attention to the historical and theoretical developments and branching processes of STS, we would find that **philosophical discussions were necessary conditions** of these developments. Thus, in a way, the development of STS is embedded with philosophy of science[9].

Now, instead of going to trading zone for exchanging ideas, this paper suggests some more radical and perhaps more fruitful strategies, whose lessons are to come from two mini-case studies in this paper. One is about how a philosopher of technology (Langdon Winner) criticizes STS/SSK ("Upon opening the black-box and finding it empty") and appropriates STS ("Technology Studies for Terroirsts"[10]) in different contexts and times. While writing a paper ("Do Artifact Have Politics?") quite influential in STS, Prof. Winner does not resort to normal trading zones for interactions between philosophy (of technology) and STS. More like a public intellectual from the tradition of social critique of technology and industrialism established by people like Lewis Mumford, William Morris, professor Winner has his way of positioning a philosopher of technology and crosses disciplinary boundaries at will with no visas, passports, adapter plugs or mutually agreed conference zone. It is a platform of multiple boundary-crossings constructed more from wider perspectives of public interest and social justice than from narrower viewpoint of academic identities. In a way, as a public intellectual after 911, Winner's boundary-crossings had exerted more influences on the horizons of STSers.[11]

The second mini-case study is about how a SSK scholar (David Bloor) skillfully criticizes and appropriates philosophy of science and

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9) Ibid., pp. 38-41.
10) See Winner (2006), pp. 275-92.
11) See Bijker (2003), pp. 443-50.

philosophy of mathematics at the same time. To my mind, Bloor has been successful in interpreting and appropriating those brilliant "shining exceptions" in philosophy, i.e., Ludwig Wittgenstein and Imre Lakatos. Publishing two books on Wittgenstein, Bloor has long dug into the gold mines from *Philosophical Investigation*, and also from some of its best interpretation, such as Kripke's *Wittgenstein on Rules and Private Language*. Wittgenstein's skeptical argument and solution on rule-following had become a critical wedge, for Bloor, Barnes and other earlier Edinburgh SSK people, to crack open a window from the tight philosophical logic in order to allowing for a view or a breath of social interests embedded in scientific knowledge. Thus, insisted Bloor, Wittgenstein and Kripke are really philosophers with a mind of sociologist. When asked about to which discipline his research really belongs, Wittgenstein is said to reply (and Bloor takes it seriously): "one of the heirs to the subject that used to be called philosophy." Bloor skillfully divides two kinds of philosophers: those with a mind of sociologist and those without, and no one did it better than Bloor in re-interpreting the great philosopher of mathematics (and of science) in Imre Lakatos and his *Proofs and Refutations*.

David Bloor's bold transformation[12] of Lakatos' purely dialectical and historical *Proofs and Refutations* into a case of SSK was done in two steps. First, he assigned to various mathematical actors in the book certain anthropological ideal types in terms of Mary Douglas' theory of grid and group, and secondly those ideal types were made corresponded to certain institutional structures in 18th to 19th centuries Prussian mathematical communities. All these institutional structures are to represent certain patterns of interest and power structure in those Prussian mathematicians. A phenomenal SSK operation it is. There were also some debate between Bloor and Lakatos' former students (Worrall

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12) See Bloor (1978), pp. 243-72.

and Zahar) concerning how to properly interpret some obscure passages in *Proofs and Refutations*, and to this debate Bloor pointedly added an Appendix "How Radical is Lakatos?" to his Polyhedra paper. In the end, Bloor credited Lakatos as a philosopher of mathematics who "opens the door to a sociological approach to mathematics"[13], thus another "shining exception" in philosophy of science.

Although Lakatos was famous for his paraphrase of Kant's dictum "philosophy of science without history of science is empty", he meant history "internal" history, ready for his equally famous "rational reconstructions.[14]" Thus in contrast to this background, it is indeed surprising to learn from SSK that Lakatos had open the door to a sociological approach to mathematics, a most unlikely sociological approach from a most unlikely philosopher of mathematics. And this is what Bloor is capable of showing us. Perhaps Lakatos has a quite different image in Edinburgh if we can forget about his rational reconstructions paper.[15] Similar to Bloor's boundary-crossing in the case of Wittgenstein, his boundary-crossing of Lakatos would, in the ordinary situation, get no visa or entry-permit to pass the boundary of British philosophy of science, and yet Bloor made a crucial move in transforming a most difficult case (a "recalcitrant anomaly" as it were) of pure geometrical imagination and proofs into a strikingly confirming case for sociology of knowledge. Even from the perspective of methodology of research programme, Bloor's transformation would be counted by Lakatos himself as a "progressive problemshift." In the end, Bloor published his Polyhedra paper in a history of science journal

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[13] Ibid., p. 270

[14] See Lakatos (1978),

[15] Lakatos' *Proofs and Refutations* was originally published as four papers in *The British Journal for Philosophy of Science* from 1963 to 1964, whereas his "Rational Reconstructions" paper was originally published in 1971, in a rather different intellectual context of Popper and Kuhn.

instead.

This paper ends with a discussion with Professor Chen Ruey-Lin about why academic philosophy of science is not a necessary condition, as Chen interestingly claimed it is, for the conceptual developments of STS. True, as STS was making new theoretical developments or simply branched into two subgroups (eg., SSK and ANT), STSers would talk or debate more in terms close to philosophy, e.g., realism, idealism, materialism, relativism, constructivism, and so on. But terms like these are usually not "technical terms" used by academic philosophers, rather they belong more to the vocabularies, or rhetorics of common intellectuals. This kind of intellectual wandering seems similar to what Kuhn had famously remarked before that scientists turn to philosophy only in stages of crises and revolutions. It is also clear from the bibliographies of the STSers in theoretical debates, apart from a small group of STSers like Hacking who had come from philosophy proper, most of which contain no references to academic philosophers of science. On the other hand, although originators of SSK like Bloor or even Barnes who had quite a few references to academic philosophers, they were less learned from the knowledge of philosophers than actively transforming and reinterpreting what philosophers wrote. This is quite clear from my mini-case study of Bloor's appropriation of the philosophical works of a few "shining exceptions."

Therefore one of my contentions in this paper is that academic philosophy is not a necessary condition for the conceptual developments of STS. But sometimes philosophy can be very important to STS, as we can see from cases like Wittgenstein or even Kuhn which has inspired so many earlier SSK people (e.g., Bloor, Barnes, Collins, Lynch, to name just a few), which is more than just a necessary condition. Nor do I wish to say that philosophy is less important to STS than history [16] or sociology to STS. There is, to my mind, no fixed essence of

STS but its historical and evolutionary developments, and we might expect surprising new turns in the near future, especially in East Asia.

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16) Lorraine Daston's important 2009 paper seems to be symptomatic of a coming divergence between STS and history of science. See her (2009). Shapin and Schaffer's new introduction to the 25 years edition of *Levithan and Air Pump* again seems to me confirms this new tendency. See their (2011), pp. xxviii-xxxi. Much more studies are required.

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STS와 과학철학 간 관계에 대한 재고의 확장된 서문

<div align="right">푸 다위</div>

이 연구는 STS와 과학철학 간 관계를 재고하는 글로서 2013년 대만에서 발행되는 학술지 STM에 게재된 나의 논문에 대한 확장된 서문이다. 이 글은 먼저 과학에 대한 각각의 관계들을 비교하여 그 관계를 이해하려고 시도한다. 농담처럼 말하듯이, 과학에 대한 과학철학의 관계가 마치 유성(meteor)에 대한 기상학(meteorology)의 관계라면, 과학에 대한 STS의 관계는 무엇인가? 과학에 대한 그들의 관계는 좀 더 복잡하고 정교하다. STS학자들은 먼저 과학철학자들을 겨냥한 위의 농담에 대해 대답해야 한다. 둘째, 이 글은 STS와 과학철학 간 아이디어를 교류하기 위한 안전하고 외교적인 교류 지대를 구성하는 대신에, 몇 가지 보다 급진적이고, 아마도 보다 유익한 전략을 제안한다. 그 하나는 기술철학자(랭돈 위너)가 어떻게 STS를 비판하면서도 다른 맥락들에서는 그것을 이용하고 심지어는 장려하는지를 다룬다. 다른 하나는 SSK의 설립자 중 한 사람인 데이빗 블로워가 어떻게 능란하게 수리철학을 이용하면서 심지어는 그 분야의 주요한 학자들 (예를 들어, 임레 라카토슈) 중 몇몇을 개종하려고 하는지를 다룬다. 이 글은 왜 과학철학이 STS의 개념적 발전에 대한 필요조건이 아닌지에 대한 대만 과학철학자 첸 루웨이 린의 견해에 대한 비판적 논의로 마무리되지만, 그것은 때로는 단순한 필요조건 이상일 수가 있다.

주요어: 랭돈 위너, 데이빗 블로워, 임레 라카토슈, 과학철학과 STS
관계, 경계넘기