

The History of Japanese Science: Recent Developments

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Abstract The field of the history of Japanese science is at a crossroads. By working with STS scholars, promoting interaction with the Asian region and beyond, the field can be reinvigorated. This paper outlines the current situation and identifies key institutions and players who will lead the field into the twenty-first century.

Keywords Japan · History of science · Science and technology studies

1 Introduction

Over 20 years ago, I was asked to write a country report on Japan for the journal *Social Studies of Science* (Low 1989). This article provides me with an opportunity to comment on the field in Japan and beyond during the two decades that have followed. I am still somewhat of an outsider, based as I am at a distance in Australia, but my location allows me to comment more freely on what has transpired in recent times. I have visited Japan once or twice a year and have stayed in touch with Japanese colleagues especially on those occasions and when I have been in the USA participating in workshops and conferences.

While there is some news for celebration, there are also less positive signs in terms of the state of the field of the history of science in Japan. While my focus is primarily Japan, there is considerable activity outside of Japan which serves to enrich the field. Taking that into account, there is room for optimism.

2 The Nobel Effect

Firstly, let us examine the good news. In recent years, the Japanese have been winning Nobel prizes in physics and chemistry. In addition, there have been

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anniversaries for Nobel prize winners such as Yukawa Hideki and Tomonaga Sin-itirō.¹ This Nobel effect has resulted in exhibitions and some publications (Yukawa Tomonaga Seitan Hyakunen Kikaku Ten Inkaï 2006; Nambu 2007; Ohnuki 2009; NHK 2009; Maskawa 2009). While historians of science are not always involved, the prizes do create some opportunities for professional historians.

Secondly, there has lately been some activity in archives which historians rely on to do their work. The archives holding the papers of Yukawa, Tomonaga, and Sakata Shōichi at Kyoto, Tsukuba, and Nagoya Universities, respectively, have recently received funding to assist in further processing and some digitization. At the same time, there has been some activity to deal with the archives of Japan's national research institutes. But resources for doing the history of Japanese science are not confined to national borders.

3 Academic Institutions

Although many people bemoan the lack of academic jobs in Japan and elsewhere, a PhD studentship at Cambridge University, postdoctoral fellowships at Harvard and MIT, and a 1-year visiting studentship at Johns Hopkins, all in the history of East Asian science and technology, provide new opportunities for early career researchers seeking to establish themselves in the field.

Where do graduate students writing about the history of science in Japan go? The University of Tokyo and the Tokyo Institute of Technology have traditionally been strong. There has and will be a changing of the guard in the relevant departments at those institutions. The number of graduate students who have passed through the graduate programs is small but of high quality (Itō 2002; Kikuchi 2009). In Japan, students are required to sit an examination to gain entry into graduate school. One further complication is that the history of science graduate program at the University of Tokyo requires a substantial science background for admission.

There are also historians of science at other universities such as Tsukahara Tōgo at Kobe who singlehandedly nurtures undergraduate and graduate students who go on to further studies elsewhere (Miyagawa 2008). There is some evidence of more movement within Asia rather than the more usual movement of bright students to programs largely in the USA.

The results of a 2008 survey of tertiary institutions in Japan that offer courses in the history of science and technology was recently published online (History of Science Society of Japan 2009). Conducted in response to perceptions that the number of courses was shrinking and the field was in a state of crisis, the survey found that 63% of courses were offered in the Kantō region of Japan and within that region, the Tokyo metropolitan area dominated. Institutions in Tokyo were responsible for more than half of all such courses offered nationwide. Of the institutions of higher education that offered courses in the history of science (broadly defined), 94% were universities. More than half of the institutions that offered such courses were private. As to the status of those who convened such courses, 30%

¹ Throughout the text of this paper, Japanese names are given with family name first, followed by given name. The list of references is in alphabetical order according to family name.

were taught by part-time instructors with the remainder taught by professors of various rank. The conclusions that can be drawn from this is that in Japan, education in the field of the history of science and technology in Japan is particularly strong in Tokyo, occurs in universities, and is reliant on a casual workforce for up to one third of its teaching. What is more, the courses are overwhelmingly offered at undergraduate level (87%), feeding concerns regarding the ability of the field to reproduce itself amid a background of retirements and restructuring of universities.

Although Nakayama Shigeru has long since retired from the University of Tokyo and then Kanagawa University, he continues to be active and his co-edited, multivolume series of books originally published by Gakuyō Shobō, has been translated into English as *A social history of science and technology in contemporary Japan* and published by Trans Pacific Press (Nakayama et al. 2001, 2005, 2006a, b). A collection of Nakayama's papers in English have also just been published (Nakayama 2009). Yamazaki Masakatsu, a noted expert on the history of Japanese nuclear weapons research (Yamazaki 2009a, b), will also soon be retiring from the Tokyo Institute of Technology.

Scholars such as Nakayama and Yamazaki taught many undergraduate students at their respective institutions. What type of undergraduate students study the history of science today? As might be expected, those majoring in science and engineering, the social sciences, humanities, and international studies are dominant, followed by those studying law, politics, economics, management, and those doing liberal arts. A matter of some concern is how few students in education, information sciences, environmental studies, and agriculture, health, and welfare take courses in the field (History of Science Society 2009, 6).

In the USA, where do graduate students interested in the history of Japanese science go? James Bartholomew at Ohio State University has been the single largest trainer of historians of Japanese science. They have gone on to publish their work and contribute to the field (Grunden 2005; Nishiyama 2007; Wittner 2008), as have students trained by Sharon Traweek and her colleagues at UCLA (Mizuno 2009) and from Harvard (Itō 2002; Kim Dong-Won 2007b). Recently, graduate students in the field have also been trained at Johns Hopkins, Cornell, and the University of Pennsylvania.

In Asia, Seoul National University has arguably the largest graduate program led by Lim Jongtae and Hong Sungook. Several students work on Japan or colonial Japanese science in Korea. And there is much expectation that graduate programs (albeit in STS) will one day be established at both the Korea Advanced Institute of Science and Technology where Kim Dong-Won (2007b), Park Buhm Soon, and Shin Dong-Won (2004, 2008) are based, and the National University of Singapore where Gregory Clancey (2006) is active.

4 Publishing Activity

Publications are one sign of the health of the field. Perusal of the bookshelves in major stores in Tokyo show that the field has considerably diminished. People seem to be publishing less and stores seem to be selling fewer titles. The mainstay journals of the History of Science Society of Japan are *Kagakushi Kenkyū*, which is Japanese

with English-language abstracts, and *Historia Scientiarum* (edited alternately by Hashimoto Takehiko and Furukawa Yasu), which mainly publishes in English. The *Japan Journal for Science, Technology and Society* edited by Matsumoto Miwao appears once a year. It includes papers on the history of Japanese science.

The new initiative of *East Asian Science, Technology and Society: An International Journal* sponsored by the National Science Council, Taiwan represents one of the most exciting developments: regional engagement. A particularly important special issue of the journal (vol. 1, no. 2) was edited by Tsukahara Togo (2007) and devoted to science in Japan's former colonial universities, especially Taihoku Imperial University in Taiwan, a country which was in many ways a laboratory for Japanese colonial policy. There have also been important studies of colonial medicine in Taiwan published in other issues of the journal including Wang (2007) and Liu (2008). In terms of monographs, the work of Ming-Cheng M. Lo (2002) and Michael Shiyung Liu (2009) come to mind.

This is all very heartening, given that studies of Japanese colonial science demand considerable language skills on the part of students and scholars. English is often the *lingua franca* but what is impressive is how we now have cases of a Japanese graduate student studying at Seoul National University with excellent Korean writing on the Japanese in Korea (Miyagawa 2008) and a former Korean graduate from Seoul who studied at the University of Tokyo for his doctorate in the history of Japanese science. The latter went on to publish his thesis with that university's press and find an academic job in Hiroshima (Kim 2007a, b).

In addition to this two-way flow (albeit a trickle) of graduate students between Tokyo and Seoul, we are seeing more Japanese and South Korean universities being encouraged to teach more in English, a development that can only widen opportunities for more interaction with visiting faculty.

While it might be easy to conclude that the field has declined over the last twenty years, the *East Asian STS* journal has served to boost the field and is improving engagement with the region. The colonial period and more recent economic development of Taiwan and South Korea were characterized by shared histories with Japan, for better or for worse (Tsukahara 2006). So there is much work to be done.

5 Nexus with Other Fields

Finally, we can say that many historians of Japanese science can also be viewed as being part of the STS project with much of the research activity focusing on modern Japan. There are, of course, scholars such as Kuriyama Shigehisa (Hashimoto and Kuriyama 2002) and Timon Screech (2002) who write about Edo-period Japan from the seventeenth through to the nineteenth century and the occasional literary study which throws light on the history of science by people such as Ibi Takashi (2009) but in contrast to the history of Chinese science, the Japanese focus tends to be more recent. For example, see the work of Kim Dong-Won (2007b) and Morris Low (2005a, b, 2006).

This has meant that the history of Japanese science lends itself to meaningful insights from cultural studies. The work of Yoshimi Shunya (2003, 2006) in the cultural history of technology is particularly noteworthy. While his work is arguably

more technology than science, it is difficult to draw the line. From the late nineteenth century, there were science-based innovations and attempts to understand traditional technologies in terms of Western science. So the division is fuzzy.

The rise of interest in the contribution of women has also added to the literature. Two welcome additions in the history of Japanese science literature are Iinuma Nobuko's 2007 study of the international marriages of prominent Japanese figures (including scientists and an engineer). Also worthy of attention is Yamazaki Miwae's new edited collection on the life of the physicist Yuasa Toshiko (Yamazaki 2009a, b).

By being open to influences from areas such as cultural studies and gender studies and of course East Asian STS, the field of the history of Japanese science can only move forward. We can learn much from each other. Despite the achievements of historians such as Nakayama, much work still remains to be done. We look to the future with a sense of excitement.

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