1. Introduction

As any form of human activities, production of scientific knowledge is fallible and not immune to ethical and moral problems. There are various forms of social injustice in science even today. One form of such social injustice that seems to persist is gender inequality. While discrimination based on gender is widely regarded as unfair in most developed countries, scientific research systems in these countries are not necessarily devoid of it. Women researchers are likely to receive unfair treatment in their education, peer evaluation, and promotion.

Considering the growing influence and skyrocketing cost of modern science, existence of such injustice within science can be a matter of concern. Should we entrust production of such dominant form of knowledge to the system mired by such injustice? Can we believe that science responsibly plays a positive role to better the world outside when it tolerates continuing existence of such injustice within?

Rather than social relations of science, my concern here is whether such injustice within science is compatible with the values and operations of modern science. As any other forms of human activities, production of scientific knowledge involves various human values and norms, and the product, scientific knowledge, is not value-free, even when it is presented as if it were neutral. Operation of scientific research is regulated by such values and norms. Hence, there are three possibilities. Is the social injustice within science such as gender discrimination a deviation from the normal state of science, and therefore detrimental to the normal operation of science? Or, is it neutral to science, and science works no matter whether such injustice exists within? Or, is it actually good for advancement of science for some reason, or in a certain situation?

In this talk, I will discuss this question by examining the case of Yuasa Toshiko.

2. Norms of Science

Before discussing Yuasa’s case, however, I outline some of the ideas in science studies about the working of science. A classical theory of how science works (or should work) is presented by the American sociologist Robert K. Merton. Merton thought that there would be a certain set of norms for scientific research to operate properly. Famously, Merton proposed four of such norms. They are: communism, universalism, disinterestedness, and organized skepticism. (see the glossary for an explanation of these norms). Later Merton modified his position by adding counter-norms, which appear
desirable in some case for operation of scientific research.

As Merton's study suggests, there are certain values and norms that seem to be either inherent or desirable for a scientific community to function effectively. What norm is desirable is, however, depends much on individual case.

3. Life and Career of Yuasa Toshiko

Yuasa Toshiko (1909-1980) is the first Japanese female physicist, who spent most of her life in France. Raised and educated in pre-World War II Japan, Yuasa had to endure gender discrimination far harsher than today. While studying physics in Japan, Yuasa was impressed by Frédéric Joliot and Irène Curie's work. In 1939, granted scholarship from the French government to study in France, she left Japan. She studied under Joliot and received a doctorate in 1943. When France was liberated by the Allied, Yuasa, a citizen of the Axis, had to escape and returned to Japan through the Siberian railroad just before the end of the war. In Japan, she became a professor at her alma mater, Tokyo Women's Higher Normal School. She, however, returned to France in 1949 and worked as a CNRS research fellow in Paris. She stayed in France until her death.

Yuasa received unfair treatment to the extent she chose to move to France. While she was a student, there were only very limited opportunities for her to pursue scientific education. When she returned to Japan as an accomplished experimental physicist, there were very limited positions for her. She found a teaching professorship but only adjunct research positions.

Such unfair treatment was mostly a result of the Japanese socio-cultural norms, as well as the general social situation. Women were not expected to be highly educated unless they became teachers. After the war, the general social and economic situation was far from favorable even for the best male physicists. Around that time, Japan began to have a fairly strong group of atomic physicists in the Tokyo area, led by Nishina Yoshio. Nishina was a highly respected senior physicist, whose leadership created an extremely active and collaborative community of atomic physicists in Japan. It appears, however, that Yuasa could not have very congenial relationship with him.

In France, Yuasa found, not only a research environment more favorable for female scientists, but also an ideal mentor, Frédéric Joliot. Yuasa saw in him a combination of highly moral personality and a scientific spirit of the first class. Compared with French science, Yuasa could not see science and scientists in Japan favorably.

4. Conclusion

The social injustice of gender discrimination in pre-WWII Japan was partly contingent but partly tied to scientific practices of the time. It was certainly a production of the historical situation of Japan. Yet, as Yuasa found in France, a better form of scientific practices was conceivable, where both scientific ideals and gender equality were already realized. In Japan, although under Nishina's leadership, a strong research community of physics was rapidly forming, higher priority was placed on the communal development of scientific standards, not social justice to each scientist.