

Toward Catastrophe **Images of Atomic Energy in Western and Japanese literatures**

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Abstract

The release of atomic energy is one of the great achievements of science and technology, and at the same time, one of its catastrophes. Japanese people have been able to imagine atomic bombs before the catastrophic experience of Hiroshima and Nagasaki, yet, for a long time, many people have not known about the public image of the atomic bomb in wartime Japan.

This paper examines the public image of science and technology by looking at the public view of atomic energy and, more specifically, atomic weapons, before they have become reality. Japanese people envision atomic energy as a scientific dream, however they have suffered at the hands of the atomic bomb at the end of the WWII. I will analyze the images of atomic energy in Western and Japanese literatures and examine how these images mean to Japanese.

Introduction

The atomic bomb was one of the great technology inventions of the 20th century, and it had a significant impact in many fields. After Hiroshima and Nagasaki, the release of atomic energy has been called as the “Fire of Prometheus”. This technology also became a positive motivation for public skepticism about technology in the latter half of the 20th century.

My intention in this study is to capture the public image of science and technology by looking at the public view of atomic energy and, more specifically, atomic weapons, before they became reality. The way people envision atomic energy is closely related to their image of technology in general, because the way people look at a new technological advance is affected by their general image of technology.

I would like to capture the public image of science and technology by looking at literature. I regard literature as a screen which projects the imagination of past writers. Literature can be seen as a reflector and promoter of the public view to some degree. There are several researchers who

looked to science fiction as a representation of public imagination or a prediction of future science.¹ In fact, atomic bombs did appear in some fictional novels before Hiroshima and Nagasaki. These literary works have been studied by some researchers.² However, their investigation dealt only with Western literature (mainly English literature), and none of them had paid attention to Japanese literature. In this paper I will analyze the images of atomic energy in Western and Japanese literatures.³ I shall divide my analysis to the periods before 1938 and after 1939, the year of the discovery of nuclear fission.

Japan is a country which suffered an atomic attack and, at the same time, one of the countries which were engaged in atomic bomb development projects during WWII. There were public discourses about the making and use of the atomic weapons. For example, it was a popular topic in Japanese newspapers and journals during the war. What tension can we find here between dreams and reality?

1 Images of Atomic Energy before 1938

1 Western literature

Before 1938, we can find both hopeful and fearful images of atomic energy in Western literature. There were relatively pessimistic in European and optimistic in American.

The pessimistic image of science spread in the end of the 19th century European. For example, the idea of the destruction of the planet was a familiar topic in Europe. Physicists suggested that millions of years from today the sun would cool off and the earth would freeze.⁴

The discovery of X ray and radiation at the end of 19th century attracted considerable attention and many researchers investigated inner mechanism of atom. Following these scientific investigations, the possibility of atomic energy became known through various media, such as popular novels. For example, Anatole France wrote *Penguin Island* in 1909. In this novel, the physics-minded terrorists destroyed entire cities with pocket-sized atomic explosives.⁵

1 Karlheins Steinmuller stated that “perhaps, science fiction has the strongest impact on the public conception of future scientific achievements and future hazards in these fields”: Karlheins Steinmuller “Science fiction and science in the twentieth century” in *Science in the Twentieth Century* (Routledge, 1997), 358.

2 For example, Albert L. Berger, “The Triumph of Prophecy: Science Fiction and Nuclear Power in the Post-Hiroshima Period,” *Science Fiction Studies* 3 (1976). Paul and Stephen Niseenbaum Boyer, *By the Bomb’s Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Pantheon Books, 1985). Paul Brians, *Nuclear Holocausts: Atomic War in Fiction, 1895–1984* (Kent, Ohio: Kent State University Press, 1987). Spencer R. Weart, *Nuclear Fear: A History of Images* (Cambridge, Mass.: Harvard University Press, 1989). Jerome Shapiro, *Atomic Bomb Cinema: The Apocalyptic Imagination on Film* (New York: Routledge, 2001).

3 I realize that it is problematic to treat the West as a single entity, and that the West and Japan can’t simply be compared. But in order to analyze Japanese image of atomic energy, I want to compare it with previous Western research.

4 Spencer R. Weart, *Nuclear Fear: A History of Images* (Cambridge, Mass.: Harvard University Press, 1989), 19. Some physicists interested in the inner mechanisms of the sun believed that atoms contained huge amounts of energy.

5 Spencer R. Weart, *Nuclear Fear: A History of Images* (Cambridge, Mass.: Harvard University Press,

The first piece of literature that seriously investigated the possibility of atomic energy was H.G. Wells' *The World Set Free*, written in 1913 and published in 1914.⁶ In this novel, Wells predicted the Second World War and the atomic bomb. Atomic energy was depicted as a weapon which would end the last war, and a new world was created after this weapon devastated the world.

H. G. Wells is seems to be the first person who predicted the future problems caused by science and technology while another founding father of science fiction, Jules Verne, drew an optimistic picture of technological future.

In the U.S, there were more optimistic images of technology. At the beginning of the 20th century, it was thought that the energy problem would be solved by technological advances. Atomic energy was seen as a promising future technology. For example, Gallet P. Serviss wrote the serial "A Columbus of Space" in *All-Story Magazines* in 1909. In this story, a man-made uranium-powered atomic rocket ship had travels to the Venus. This story presents an optimistic future of atomic energy.

The First World War had a significant impact on the public view of technology both European and American. Weapons such as poison gas, tanks and machine guns were created during this war, and people felt fear about war-related technology. According to studied apocalyptic descriptions in literature, the war broke out, namely before 1914, two thirds of those fictional apocalypses were from natural causes. While after 1914, two thirds of those were caused by humans, and of these, three-quarters were the results of world wars with futuristic weapon technologies.⁷

J. B. Priestley's "The Doomsday men" published in 1938 is an example of a catastrophic image of the atomic bomb.⁸ In this novel, a group of religious fanatics come close to destroying the world by bombing a lump of radioactive element with a cyclotron.

In Western countries, many people felt fear about science and technology when they confront with The First World War. Still there were hopeful and fearful images of the atomic energy.

II Japanese Literature

In Japan, the image of science and technology was a more positive one. Since the Meiji era (1868–1912), the Japanese had made an effort to achieve modernity through scientific progress.

In the Taisho era (1912–1926), science and technology was widely seen as bringing a new life style. This was called the "Era of Technology", in which household technology spread rapidly. Popular science magazines also began to be published. In addition, the Great Kanto Earth Quake and Einstein's visit in the 1920s had a great impact on the popularization of science.

More than 100 thousand people were killed by the Great Kanto Earth Quake in 1923. Many Japanese thought that such natural disasters would be eliminated by technological advances. After the earthquake devastated the old city of Tokyo, a new urban city was constructed. Following the new urban lifestyle, a new literary genre, the "detective story" or "scientific story", bloomed in magazines. The magazine which shaped this detective genre was *Shin-Seinen*, first published in

1989), 23. Anatole France, *Penguin Island*, trans. A. W. Evans (New York: Dodd, Mead, 1909), book 8.

6 H. G. Wells, *The World Set Free* (1913; New York: Dutton, 1914).

7 Warren Wagar, *Terminal Visions: The Literature of Last Thing* (Indiana Univ Pr, 1982) 27, 110.

8 J. B. Priestley, *The Doomsday men: An Adventure* (London: Heinemann, 1938).

1920. These magazines introduced foreign writers such as Edgar Allan Poe and H.G. Wells, and also promoted Japanese fiction writers.

One of the popular writers of *Shin-Seinen* was Juza Unno, who became a productive writer during the 1930s and 1940s and has sometimes been called the Japanese founding father of SF. He was an ex-engineer, eager to gather new information about science and technology from abroad to inspire his writings. Furthermore, he was influenced by H.G. Wells. He wrote about “atomic transformation” in his short novel “A Broadcast of Last Words (Yuigonjo Hoso)” in 1927.⁹ It was a story about a young amateur telegrapher who receives a radio message from aliens from outer space. The aliens unexpectedly caused an atomic explosion while researching atomic energy. However by the time they realized it, it was too late, since the first explosion caused a chain reaction of further explosions. The young amateur telegrapher was killed, because, he thought, of his involvement with this enormous universal explosion; yet in fact, he was killed because of the crash of an airplane into his house. This novel is probably one of the first in Japan to deal with nuclear power. Here, the atomic explosion was caused by aliens rather than by humans, and the protagonist was only a passive victim.

I couldn't find any other Japanese literature which dealt with atomic explosion before discovery of the nuclear fission. We can assume that many Japanese were not acquainted with the idea of the devastation of the world by atomic energy, and did not imagine such a scientific doomsday. Undoubtedly, some people felt anxiety toward the technological advances, but this was not the popular image.

In 1931, the Mukden Incident occurred, and Japan entered into the fifteenth year war. With this incident, the image of modern technology changed to that of weapons of war. Gradually, technological development turned into the development of new weapons, as we will find in the next chapter.

2 Towards an Atomic Bomb (Images of Atomic Energy after 1939)

The nuclear fission discovered at the end of 1938. The news was spread the world at the beginning of 1939. Although there were some novels which dealt with atomic bombs before the discovery of nuclear fission, more and more people came to think about atomic bombs after this discovery. The U.S. government secretly launched up the “Manhattan Project”, namely, atomic bomb project in 1942. Japanese also started atomic bomb project around 1942 although the size of the project was quite much smaller than the U.S.

I would now like to examine the literature in those countries during this period (after 1939 to 1945). Because the pacific war had started in 1941, there was almost no connection between them, for example, no export of magazines.

I Western literature

⁹ Juza Unno, “A Broadcast of Last Words (Yuigonjo Hoso),” in *The Collected Works of Juza Unno* (Tokyo: San-ichi Shobo, 1990), vol. 1; Originally published in *Musen Denwa (Wireless Telephone)* March 1927.

Science fiction writers predicted the atomic bomb with considerable accuracy in the U.S.¹⁰ The magazine which published novels related to nuclear weapon was *Astounding Science-Fiction*, the most full-scale science fiction magazine in the U.S. The reason for this was because of the chief editor, John W. Campbell. He was one of the people who actively considered atomic energy as early as the mid 1930s. Some writers who debuted in the magazine wrote about atomic energy.¹¹

A. E. Van Vogt dealt with atomic energy in the serial entitled “Slan” in the 1940. This story was set a thousand years into the future, when atomic energy was harvested by mutants. Another writer Robert A. Heinlein treated atomic energy as a more serious problem. In 1940 he wrote “Blowups Happen”. This novel dealt with a uranium nuclear reactor in the future and asked the following question: if someone has brought an irrevocable catastrophe, what should we do?¹² In 1941 he wrote “Solution Unsatisfactory”.¹³ According to Albert Berger, this story is the only novel which was set in the contemporary world and depicts nuclear weapons before Hiroshima.¹⁴ In this novel, one dictator holds a nuclear weapon in his hands in order to prevent the world from devastation. Theodore Sturgeon published “Artnan Process” in 1941. This novel describes a power struggle for information on the process for separating uranium235 from uranium238.¹⁵ Cleve Cartmill depicted the making nuclear weapons in the “Deadline” published in 1944. The depiction of the process was very similar to the one in Los Alamos, where the U.S. atomic bomb project was conducted.

In this period, technological developments translated into the appearance of new-weapons and the atomic bomb project was easily predictable, even though the Manhattan project was a confidential matter.

II Japanese Literature

With the discovery of nuclear fission, the possibilities of nuclear energy attracted more attention. Writers such as Juza Unno began to incorporate the idea of atomic energy into their novels.

Juza Unno dealt with atomic energy in “The World in a Thousand Years (Sen-nengo no Sekai)” in 1939.¹⁶ In which all power sources are atomic. Unno also wrote about nuclear-powered submarines in his serial story “Earth Fortress (Chikyu Yosai)”.¹⁷ This story was published in *Hyokai* from August 1940 to March 1941. It is a kind of military fantasy story set in the same age as the

10 Albert L. Berger, “The Triumph of Prophecy: Science Fiction and Nuclear Power in the Post-Hiroshima Period,” *Science Fiction Studies*, 3 (1976).

11 Albert L. Berger, “The Triumph of Prophecy: Science Fiction and Nuclear Power in the Post-Hiroshima Period,” *Science Fiction Studies*, 3 (1976).

12 A. J. Friedman and C. C. Donley, *Einstein as Myth and Muse* (Cambridge, Cambridge University Press, 1985).

13 Anson MacDonald, “Solution Unsatisfactory,” *Astounding Science Fiction*, May 1941.

14 Albert L. Berger, “The Triumph of Prophecy: Science Fiction and Nuclear Power in the Post-Hiroshima Period,” *Science Fiction Studies*, 3 (1976).

15 Theodore Sturgeon, “Artnan Process,” *Astounding Science Fiction*, June 1941.

16 Juza Unno, “The World of Thousand Years Later (Sen-nengo no Sekai),” in *Collective work of Juza Unno* (Tokyo: San-ichi Shobo, 1990), vol. 7. Reprinted by *Weekly Asahi (Shukan Asahi)* July 29, 1939.

17 Juza Unno, “Earth Fortress (Chikyu Yosai),” in *The Collected Works of Juza Unno* (Tokyo: San-ichi Shobo, 1990), vol. 7. Reprinted by *Hyokai*, August 1940 to March 1941.

previous one. Unno writes about “Atomic Bullet Destruction Machine (Genshidan Hakaiki)” as a very powerful weapon, a kind of powerful atom-smashing machine, which releases 300 times more than it put into.

Though these novels depicted atomic energy as new energy sources, after the Pacific war was broke out in 1941, atomic energy became atomic weapons in the novels. Many writers wrote about atomic weapons as which could bring victory for their country and no one connected it with an apocalyptic image.

The magazine *Shin Seinen* published three works referring to the atomic bomb in the latter half of 1944. Its July issue published Ken Tachikawa’s novel “The Obliteration of San Francisco”. It was a story about a uranium 235 bomb made by Japanese scientists. The bomb was transported by an airplane propelled by nuclear engines, and was dropped on San Francisco, which was completely destroyed. In this depiction of the scene of the San Francisco’s destruction, the mushroom cloud, the icon of the atomic bomb in postwar society, is notably absent. And the scientists made atomic bomb with chemical method.

The December issue of *Shin Seinen* published Jūza Unno’s “Office of Intelligence”. In it, a Dr. Taylor succeeds in developing a “Tayclotron”, a device much smaller than a cyclotron which is light enough to be loaded on an airplane. Unfortunately, because it is too powerful, it explodes, destroying the laboratory and killing the scientist.

Japanese wartime literature depicted atomic energy as a promised future technology, and yet no one could suggest the possibility of their being a nuclear assault.

Comparison and Conclusion

This research illustrated the difference in the image of atomic energy between Western and Japanese literature, as well as how this image changed. Here I summarize the points.

Apocalyptic image

In Western countries, many people heard the tales of atomic energy. Imagining atomic energy created fear and hope, namely a bipolar image. This can be seen as a reflection of the optimistic and pessimistic images of technology. One important element in this image is that the devastation of the world by atomic energy gives rise to a new world. Here there seems to be an influence by the eschatology of Judeo-Christian apocalyptic theology.¹⁸ This seems to be one example of the connection between the image of science and religious thought.

Western people felt fear and hope regarding atomic energy, as it seemed to make the apocalypse into a possible reality. This fear and hope was almost the same as that toward god. The advancement of scientific research could be seen as a process of approaching God’s world. So the image of atomic energy reflected how humans came close to God.

When we think about how and by whom the atomic catastrophe was brought, these literature shows how such the power moved from God to human. Many early Western novels described a solitary mad scientist, who constructs a nuclear weapon and threatens the entire world. In other

¹⁸ For further discussion of this issue, see Jerome Shapiro, *Atomic Bomb Cinema: The Apocalyptic Imagination on Film* (New York: Routledge, 2001).

words, according to these novels apocalypse will be caused by an evil person who achieves this huge power. Later novels described the development of the atomic bomb by groups of collaborating scientists. Here nations are the ones who have the power. The characters in all these novels were limited to military persons and scientists.

There were no apocalyptic or eschatological images of science in Japan. This contrast affected the different image of atomic energy between the two societies. In Japanese literature from the 1920s, the devastation was caused by aliens (as in the novel *A Broadcast of Last Words*). And even when humans had an atomic energy, either the technology was used for defeating the enemy. In this sense, technology was seen as no more than a tool. This image connected with the relatively positive image toward science and technology in Japan. The image of atomic energy was that of a super technology. Many Japanese thought that they could control this energy, and they could not imagine it causing a catastrophe. I believe that another reason for this is that they did not fear God.

War

The images of science and technology are also closely related with the two world wars. Western literature became more skeptical toward science and technology during that period. In contrast, the Japanese did not become skeptical toward technology as a result of these two wars.

With respect to atomic energy, many writers, both in the West and in Japan, linked it with new weapons. But the depiction of this energy was different. In wartime Japan, although the Japanese military was in retreat, the atomic bomb was seen as a tool could lead to victory. Japanese writers depicted the “atomic bomb” as one of a promising decisive weapon. Western literature, on the other hand, investigated the negative side of this technology.

I can see the strong relationship between social regime and image of the science and technology. In wartime, Japanese national polity aimed at an enforcement of science and technology, and science itself became a matter of faith. Further, writers had to rely on Japanese sources because of the wartime inaccessibility of overseas publications. And in the national magazines through which they were influenced, contributors from scientific and military backgrounds had much weight because of their importance to the war effort. Therefore literature did not depict a negative aspect of science and technology. And the image of atomic weapons was that of a savior.

Images of science sometimes worked like religion, which uniformed ideas and concepts. The blind acceptance of science and technology can sometimes make our view dim. According to this reasoning, we might even say that the positive image of science also supported fascism.

Further Discussions

One approach to Science Fiction is to see it as a kind of thought experiment¹⁹; a thought experiment that is conducted not by the science but by the social sphere. From this thought experiment, we can observe the social sphere from Science Fictions. The most obvious feature of Japanese fiction is the positive depiction of science and technology, which is reflected by the Japanese ambiguous feeling toward the West. Atsuo Matsumaru stated that Japanese were enthusiastic about science

¹⁹ Karlheinz Steinmuller, “Science Fiction and Science in the Twentieth Century,” in *Science in the Twentieth Century*, (Routledge, 1997), 355.

when they felt a sense of “inferiority” or “superiority” to the West.²⁰

The Japanese nation stepped toward for the foundation of science and technology from the Meiji Restoration. The influence of the West had become great in Japan after the Meiji Restoration, especially in terms of “science”. At the same time, Japanese intellectuals and politicians regarded science as incompatible with the Japanese spirit.²¹ The 1942 symposium “Overcoming Modernity” is notable for observing wartime ideology among intellectuals. This symposium is notable because it meant that they no longer wanted to catch up with Western modernization but wished to find an alternative. But in terms of national policy, the education and enforcement of science and technology became a priority around 1941. We can find this tension among this on a political, cultural and ideological level within the literature. Japanese common people kept contact with science in their own ways.

As above mentioned, the investigation of the image of science and technology will give us many suggestions for historical studies.

20 Atsuo Matsumaru, “What Can We See from Contemporary History of Popular Science,” in a symposium report, *Kagakushi Kenkyu*, Vol. 47, No. 248 (2008).

21 For example, Hajime Tanabe discussed the need for a synthesis between the Japanese spirit and the scientific spirit at 1936: Hajime Tanabe, “Kagaku Seisaku no Mujun,” *Kaizo*, October 1936, 18. For further discussion of this issue, see Hiromi Mizuno, “Science, Ideology, Empire: A History of the ‘Scientific’ in Japan from the 1920s to the 1940s” (Ph. D. Dissertation, UCLA, 2001).