The Two International Congresses Held in Tokyo in the 1920s: The Rise of the First Generation of Japanese Scientists

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1. Introduction

This paper examines the significance for the state of science and engineering in Japan of two international congresses held in Tokyo in the 1920s: the Third Pan-Pacific Science Congress (PPSC) in 1926 and World Engineering Congress (WEC) in 1929. These two congresses were the first meetings that were not restricted to only one branch of science or engineering but embraced various fields. I will argue that these congresses promoted the rise of the first generation of Japanese scientists.

In my review of academic institutions and societies, I discovered much about the historical situation of science in Japan after the late 19th century. In this paper, I will first introduce some general information about these two congresses, and then I will compare them by discussing their characteristics and what they can tell us about the academic situation in Japan in the 1920s.

After the Meiji Restoration in 1868, the goal of Japanese modernizers was to emulate the Western powers, and Japan began to absorb Western knowledge about science and engineering. The Japanese government had made disadvantageous treaties with European nations in the late 1850s and early 1860s. New higher educational institutions, such as the old University of Tokyo and the Imperial College of Engineering, invited teachers from Europe and the US. Around 1882, Japanese scholars who had studied under foreigners became teachers in the same colleges in order to replace them. In this paper, I call these students the "first generation" of Japanese scientists, who included the chemist Jōji Sakurai (1858–1939) and the civil engineer Kōi Furuichi (1854–1934). Sakurai and Furuichi served as the leaders of PPSC and WEC, respectively.

Generally, international congresses in the 1920s were historically significant: they marked the beginning of academic activities in all international organizations, which had been suspended for more than four years during World War I.[1] The first groundbreaking conference was held in London in October 1918 under the auspices of the Royal Society. About 30 delegates from 10 countries gathered to participate in this conference, and Japan sent two delegates, the chemist Jōji Sakurai and the physicist Aikitsu Tanakadate (1856–1952). Subsequently, Sakurai began paying attention to the international relations among the circle of Japanese academics.

2. General Features of the Congresses

2-1 The Third Pan-Pacific Science Congress in 1926

The Pan-Pacific Science Congress (PPSC) is one of the oldest international meetings. The first PPSC meeting was held in Hawaii in 1920, and the second was held in Australia in 1923. The Pan-Pacific Congresses are still held today. The 22nd PPSC, the most recent congress,

1 Sakurai, Jōji, *Omoide no Kazukazu* (Tokyo: Kyuwakai, 1940), p. 286.

was held in 2011 in Kuala Lumpur, Malaysia. The next congress will be held in Taipei, Taiwan in 2016.

The PPSC has two purposes. One is "to initiate and promote cooperation in the study of scientific problems relating to the Pacific region, more particularly those affecting the prosperity and well-being of Pacific peoples." The other is "to strengthen the bonds of peace among Pacific peoples by means of promoting a feeling of brotherhood among the scientists and, through them, among the citizens in general of all the Pacific countries." [2] Approximately 1,000 participants have attended each congress. In 1929, the meeting in Tokyo was held under the auspices of the Japanese National Research Council. Around 1,000 Japanese and 200 foreign scientists gathered as delegates from 106 academic societies in 21 countries. Two years after this meeting, the National Research Council of Japan published the proceedings of this Congress in two volumes.[3] It consisted of 470 papers (including 210 papers by Japanese scientists), and was 2,600 pages in length.

History of Pacific Science Congress[4]

No. (Year)	Venue	No. of Countries	Total Participants (from Japan)
1 (1920)	Honolulu, Hawaii	9	101 (4)
2 (1923)	Sydney and Melbourne, Australia	-	1389 (10)
3 (1926)	**Tokyo, Japan**	21	ca.1200 (ca.1000)
4 (1929)	Java, Netherlands East Indies	-	578 (more than 50)
5 (1933)	Vancouver and Victoria, Canada	-	410 (-)
6 (1939)	Berkeley, USA	-	586 (-)
7 (1949)	Auckland and Christchurch, New Zealand	-	1012 (0)
8 (1953)	Quezon, Philippines	-	- (30)
9 (1957)	Bangkok, Thai	-	ca.1000 (30)
10 (1961)	Honolulu, Hawaii	-	2654 (149)
11 (1966)	Tokyo, Japan	68	6096 (3936)
22 (2011)	Kuala Lumpur, Malaysia	44	824 (-)

2-2. World Engineering Congress in 1929

The World Engineering Congress (WEC) in Tokyo was triggered by a telegram from the US four years prior to the meeting. Masao Kamo (1876–1960), who had served as president of the Japan Society of Mechanical Engineers, received a telegram from the American mechanical engineer, Elmer Sperry (1860–1930) asking if it would be possible to hold a congress in Japan in five years.[5]

Kamo probably felt that it would be too difficult for the Society of Mechanical Engineers to plan and manage the congress. Nevertheless, he brought this inquiry to the attention of the Society of Engineering. In 1922, three years before Kamo received the telegram, the Society of Engineering changed its status from an assembly of individual engineers to an administrative body of 12 engineering societies, including the Society of

2 "The Third Pan-Pacific Science Congress," *Science*, **62**(1595) (1925): 73–74.

3 The National Research Council of Japan, ed., *Proceedings of the Third Pan-Pacific Science Congress, Tokyo, 1926*. Vol. I and II (Tokyo: National Research Council of Japan, 1928).

4 Masai, Yasuo, "Taiheiyo Chiiki no Tameno Taiheiyo Gakujutsu Kaigi," *Rissho Daigaku Bungaku-bu Ronso* [*The Jornal of the Faculty of Letters, Rissho University*], (82) (1985): 137–141; Hidaka, Kōji, "Kaiso-roku," *Tenki*, **24**(6) (1977): 299–316, p. 310.

5 World Engineering Congress, *The Report of World Engineering Congress* (Tokyo: WEC, 1931), p. 1.

Mechanical Engineers. The Society of Engineering asked the government if a budget for holding an international congress would be available in the near future. Thus, the congress began to take shape.

There were nine planning committees, and 765 members were involved in preparing for the congress. The budget they received from the government was 500,000 yen, which is 5 billion yen or 45 million US dollars in today's currency. Four years later, they successfully held the congress. Kōi Furuichi, who was president of the Society of Engineering, became the president of the WEC. The participants had to be members of their local engineering societies, through which the WEC accepted their participation in the congress. At total of 4,495 scholars were registered by the WEC. About 3,000 Japanese and 1,000 foreigners gathered in Tokyo in October 1929, which was roughly four times the number of participants at the PPSC. The WEC covered 12 fields in engineering, and 83 sectional meetings were held. The WEC collected 813 articles (371 from Japan, 442 from overseas). Two years after the congress, it published 39 volumes of proceedings, which ran to 16,000 pages.

3. Features

3-1 Differences

There were of course some differences between these two congresses, such as fields, sizes, and purposes. However, I would like to focus on one major difference: the continuation of these organizations. The PPSC still operates today, but the WEC held only the single, huge congress in Tokyo in 1929.

PPSC has continued for three reasons: First, the organizers intended from the beginning to establish a permanent organization. On the other hand, the organizers in the WEC focused only on the meeting in Tokyo. Second, in the PPSC, the topics were specified, and scientists from various fields participated in each session in order to enhance joint research projects. On the other hand, in the WEC, the fields of engineering were specified according to 12 branches, but the presenters were clustered in each session and were less conscious of collaborating with their audiences and vice versa. Third, the PPSC improved with each congress. On the other hand, because the WEC meeting was perfect, nobody thought that it could be improved, so it was the first and the last.

First, the leading members of the PPSC consciously established a permanent institution with a solid constitution. This action started in 1923 in Australia. The readers of the major journals, such as *Nature* and *Science*, had been notified repeatedly about the establishment of a permanent institution. For example, a final announcement to the readers and the academic world appeared in *Science* one month prior to the congress. The notice states, "One of the principal matters to be considered on this occasion will be the formation of a permanent or continuing organization for this series of congresses. Steps toward this were taken at the Second Pan-Pacific Science Congress, held in Sydney and Melbourne in 1923."[6] Sakurai intended to make the congress permanent at the meeting in Tokyo.

Second, the topics of the papers and discussions were clearly set by the PPSC. Moreover, scientists were encouraged to present papers that enhanced joint research. The organizing committee introduced several issues regarding the Pacific region and then selected 53 of the most significant. Participants gathered from various branches of the sciences to deal

6 "The Third Pan-Pacific Science Congress," *Science*, **64**(1655) (1926): 269–272, p. 271.

with each issue.[7] In his inaugural address at PPSC, Sakurai emphasized the features of the congress:

> It is with these views in mind that the Pan-Pacific Science Congress has been organised. Its primary object is to study the scientific problems of the Pacific by cooperative effort, and these problems do not concern one or two only, but many if not all branches of science. In this respect, the Pan-Pacific Science Congress differs from all other scientific congresses. Also because of the primary object of the Congress, which is not the direct advancement of knowledge in general, it is plainly evident that the activities of the Congress should be limited to sciences as applied to definite Pacific problems.[8]

However, in the WEC, even though the purpose of the congress was to include all branches of engineering, the participants did not understand the intention of the organizers because there were no academic communications among other divisions.

Third, all PPSCs have been developed separately. According to Sakurai, the first congress in Hawaii was a trial to see if it was feasible. When the next meeting was held in Australia, Hawaii was called the first congress. In 1923, Sakurai attended the second congress of the PPSC in Australia. He reported three areas that he felt could be improved in future congresses:

> (1) The purpose of the congress was vague; there were many papers dealing with various issues that were not related to the Pacific. I thought topics should be limited to issues related to the Pacific region. (2) The topics of many papers were too narrow to share and discuss with other participants at each session. I was disappointed at this situation. (3) There were 15 or 16 sessions simultaneously; it was deplorable that there were few opportunities for each scientist to meet other participants from different fields in each session. However, it was still natural to see some awkwardness because the second congress in Australia was actually the first official congress.[9]

Sakurai realized that such problems should be addressed to improve the following congress in Tokyo.

Compared to the organizing committee of the PPSCs, the committee of the WEC was too eager to prepare thoroughly for its success. The service of the WEC's organizing committee paradoxically resulted in its termination after just one meeting in Tokyo. The committee members were fully content with all activities, such as banquets and excursions, as well as the academic sessions. Moreover, no country volunteered to host the following congress. Even the Japanese organizers were satisfied with the success of the congress. Consequently, the WEC held only one congress because it was very well organized. After the meeting, academic activities were postponed because of the Japanese military activities that took place in the 1930s. The organizers did not discuss the continuity of the WEC, even though an idea was put forward after the meeting to make the WEC a permanent organization.

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7 Standing Committee of the Third Pan-Pacific Science Congress, ed., *The Second Circular for the Third Pan-Pacific Science Congress* (Tokyo: Office of the Third PPSC), pp. 4–5.

8 Sakurai (note 1), p. 290.

9 Sakurai (note 1), p. 42.

3-2. Common Features

The main purpose of both congresses, of course, was the international exchange of academic work. However, the first generation of Japanese scientists saw these congresses as a chance to enhance the prestige of Japan in the international academic world. The congresses had two distinct features. First, the Japanese leaders promoted the use of English in academic activities. Second, the leaders recognized that the congresses provided good opportunities to enhance the prestige of Japan in the world.

First, the Japanese participants had to use English at both congresses, which was promoted by the leaders, especially Sakurai. At that time, he repeatedly insisted that Japanese scientists should give their papers in English in order to gain the attention of Western scientists.[10] In the chemistry field, for example, the Tokyo Chemical Society (currently the Chemical Society of Japan) began publishing a journal in English in January 1926. In the same month, the Society of the Chemical Industry also began circulating abstracts of their papers in English.

Both PPSC and WEC succeeded in holding meetings in English. As I mentioned previously, about 1,000 Japanese scientists participated in the PPSC. In the proceedings published two years later, 210 papers of 470 papers were submitted by Japanese scientists. In the case of the WEC, 3,000 Japanese engineers gathered in Tokyo. The congress collected 813 papers of which 371 were by Japanese scientists. Most of these papers were written in English.

Second, the Japanese organizers tried to attract the attention of participants from foreign countries. Although neither Sakurai nor Furuichi were particularly successful academically in their lifetimes, they showed strong administrative ability in organizing these congresses. They made the most of their opportunities to enhance the prestige of Japan. Sakurai later recalled the time when he decided to hold an international congress in Tokyo. The delegate members to Hawaii in 1920 suggested that it would be possible to hold the third international congress six years after the one in Australia. Sakurai stated, “If we missed this opportunity to invite many foreign intellectuals, and give them correct recognition of Japan, I was not sure when we would have a next chance to do so. Then, I decided, in my mind, to manage the congress.”[11] He reported the outcome of the meeting:

> We successfully held a congress without any problems, like a smooth mechanical clock. Not only did we fulfil our mission, but also we gave the participants from overseas full satisfaction intellectually and materially. As a result, the intellectuals deepened their understanding of our country. Then we promoted goodwill; it was a by-product of this academic meeting. However, I thought this might be more significant than our academic success. This is not our self-praise; many prominent figures from overseas praised the success of this congress, and they said it should be a model for international meetings.[12]

Toshikata Sano (1880–1956), who served as vice president of WEC and as president of Architectural Institute of Japan at that time, reported their motivation for holding WEC in Tokyo, and states:

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10 Sakurai, Jōji, “Honpo Kagaku no Kokusaika” *Toyo Gakugei Zasshi* (520) (1926): 467–469; Sakurai, Jōji, “Dai 3kai Han-taiheiyō Gakujutsu-kaigi no Kekka ni tsuite no Kansō” *Toyo Gakugei Zasshi* (525) (1927): 1–4.

11 Sakurai (note 1), p. 40.

12 Sakurai (note 1), pp. 52–53.

> If we welcome many prominent engineers from abroad [...], and let those specialists know traditional Japanese culture besides new industry, they would explain those facts to the people when they went back to their countries. It would be a meaningful occasion to introduce a correct image of Japan to the world; this is what we thought. Then we decided to hold the congress in Japan.[13]

Besides promoting academic exchange, the congress extended its hospitality to activities offering the enjoyment of food and cultural excursions. For example, the Japanese organizers of WEC planned 100 reception parties and banquets. One participant even joked that WEC stood for "We Eat Constantly!"[14] In addition, they prepared 52 excursions, including trips to Yokohama, Aichi, Kyoto, Osaka, and Kōbe for as long as one month after the congress ended.

The National Research Council published a book called *Scientific Japan*, which was made available to all congress participants. Sakurai proudly stated that

> Current science in our country is not necessarily the result of the transplantation of western science; seismology, of course, was born and developed in our country. Mathematics and astronomy have been studied and developed since ancient times. To make these accomplishments clear and to let all participants know it, we published a book titled *Scientific Japan* and gave it to them.[15]

In addition to the several common features of these congresses, the WEC congress is historically significant in the development of the field of chemistry in Japan. The implementation of applied chemistry among Japanese scholars was introduced at the WEC congress. The historian of chemistry, Minoru Tanaka, analyzed the number of articles that had been published in the *Journal of the Tokyo Chemical Society* by 1900. He counted 58 articles that dealt with inorganic chemistry. Most articles were about pure chemistry, and only one article dealt with applied inorganic chemistry.[16] In 1898, the Society of the Chemical Industry was established because the academics in this field felt that they needed to work with the industrial sector. Furthermore, since 1924, the Society of the Chemical Industry has held workshops to encourage closer cooperation with chemical engineers. These efforts evolved from the WEC congress, at which 39 out of 71 papers in the division of the chemical industry were presented by Japanese scholars.

4. Discussion

These two congresses represent the final stages of the first generation of Japanese scientists and engineers.

In the early decades of the 20th century, Japan was a country trying to catch up with Western science and engineering. However, the international congresses held in the 1920s were historically significant, symbolic events that demonstrated to the outside world Japan's

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13 Sano, Toshikata, "Progress of the World Engineering Congress," *Kenchiku Zasshi* [*Journal of the Institute of Japanese Architects*], **44**(534) (1930): 1193–1204, p. 1194.

14 Nakamura, Gentoku, *Nihon Kogyo Kurabu 25 Nenshi, Jō* (Tokyo: Nihon Kogyo Kurabu, 1943), p. 652.

15 Sakurai (note 1), p. 52.

16 Tanaka, Minoru, *Nihon no Kagaku to Shibata Yūji* (Tokyo: Dainihon-tosho, 1975), p. 70.

rise in the field of science and engineering. In fact, the first generation of Japanese scientists succeeded in holding these major events in Japan. They successfully expanded the academic circle in Japan and raised the international status of Japan in the field of science and engineering. Among these forerunners, Sakurai proudly introduced to the world the rise of Japanese academics in the 60 years since the Meiji Restoration in 1868.[17] Hence, the 1920s was the decade when Japanese academics changed their international status from borrowers of ideas to self-sufficient, innovative researchers.

[17] Sakurai (note 1), pp. 124–135.