Pursuing History Using Contemporary Sources, Gazing on the Present and Future of Science

Interviewer: Takashi Mikuriya, professor

Came to RCAST After Acquiring his Ph.D. (in the history of aeronautical engineering) in the United States

—— Professor Hashimoto, you specialize in the history of science and technology, but what made you get into this field in the first place?

In my undergraduate days I was interested in philosophy. However, soon, I developed the desire to study something more concrete, and went on to graduate school to research the history of science. After I went to graduate school, I became filled with the desire to study abroad, so I got into the history of science program at a university in the United States.

When I actually got there, I found that there were many different kinds of history of science, and there was also a field called the history of technology. In Japan at that time, the history of technology wasn't really thriving, and there were no classes on it. In the US, on the other hand, since technology plays a significantly large role in its 200-year history, there were many scholars in the history of technology, as well as plenty of lectures and classes at universities. I had the impression that American history and the history of technology in the US were well taught, and were very deep in talent.

I decided to study at Johns Hopkins University because there was a famous professor of the history of physics there, but I got there just after he had moved somewhere else. Still, there were other good professors there, and I stayed there from 1984 to 1991--about six and a half years.

—— So, you lived the student life for quite a while.

Yes, I lived the student life for almost too long. At the graduate school there, I wrote my doctoral dissertation on the history of aeronautical engineering and aerodynamics.

—— So it's not surprising that you're at RCAST, the successor to Koken (the Aeronautical Research Institute).

Yes, it's almost fate that I came here. In April of 1991, I returned to the [the University of Tokyo's] College of Arts and Sciences at Komaba, and I came here in May 1996.

Research on "Time" and "Standards," then Publication

—— They're rather vocal about "mission" here (at RCAST), but what was the mission when you first came here? (laughing)

(laughing) No, they weren't very vocal about mission then. I remember, when I started here, the director of the institute told me to do whatever I wanted.

On one hand, I felt that I was invited to RCAST to research the social significance of advanced science and technology. On the other hand, what I can really write about is the area of the history of science and technology. I had a vague idea that I would research something where the two overlap. A little encouraged by the words "do whatever you want," I held a strong desire to discover a research topic that was simply interesting.

—— You've been here for ten years. What have you worked on?

In the end, I have published books about "time" and

"standards" (*The Birth of Tardiness: The Formation of Time Consciousness in Modern Japan; The Philosophy of the Standard: 300 Years of Standard Technology*).

Since I had once studied in the US, I have written some papers about the history of science and technology in the US. How have tscience and technology in the US--which have extremely strong ties to the military--developed from World War II, through the Cold War, and up to the present? What kinds of things have occurred in their relation to the military? I have written an introductory paper about these questions while reviewing recent research. When I first came to RCAST in the early 1990s, a lot of academic research was coming out on the topics such as "Looking back on the history of science and technology in the Cold War."

Turning his Office into a Forum for International Exchange

—— Professor, I think you have had many students come and go over the past ten years, but haven't there been a lot of students from overseas, for instance, from the US, China, and Korea?

Yes. There have not been so many students, but a lot came as visiting scholars, and it has been stimulating. Many have been interested in researching the history of technology and the sociology of science in Japan--both modern and contemporary. I believe I was introduced to and took on over ten foreign students.

There were some from Taiwan and Europe as well. Some even came because they wanted to study Japanese "fuzzy" technology. Some are enrolled as "cooperative researchers"--a very good system. This kind of exchange is quite common.

—— In that sense, this is a place where people researching the history of science and technology come together. When you come here, you will definitely have contact with fellow scholars, and that's where discussion is born... It has become a "discussion corner," in an extremely good sense of the term, hasn't it?

That's true I think it's become a very good forum. Kenji Ito, who studied at Harvard, came as a special assistant, and he chaired RCAST's "colloquium." He circulated article drafts before presentations, giving colloquium participants a chance to add their comments. All kinds of opinions emerged, and I think it really helped articles for publication.

—— In a place like that, where a certain level of people--like students and visiting researchers--are gathered, they can exchange information quickly, without having to explain in too much detail, and they can benefit from intellectual stimulation. That's a great point, isn't it?

Yes. As you might expect, in the humanities and social sciences, if they are within a related field like a neighborhood to some extent, the exchange of information and opinions proceeds smoothly, and we can all benefit from intellectual stimulation.

At present, RCAST has been preparing the machine tools and experimental implements used by the Aeronautical Research Institute (RCAST's predecessor), as well as troves of related documents, to be displayed inside the campus. The Aeronautical Research Institute (Est.1918) was closed by [the American] GHQ after World War II, but after that it re-opened as the Institute of Science and Technology (Est.1946), later the Institute of Space and Aeronautical Science (Est.1964). The present-day RCAST got its start in 1987.

——This place has a long history since its days as the Aeronautical Research Institute, and all kinds of things are still here. Professor Hashimoto, since you have been put in charge of managing these items--and I think you've worked very hard at it--can I ask you to talk about that?

When I came here, Professor Takashi Tachibana was a visiting professor at RCAST, and he created the "RCAST Exporation Team." At that time there were still old buildings standing on this campus. I'm told that each of those buildings had strange items left behind (laughing) --instruments, experimental equipment, and machine tools were introduced to me as "historical relics."

For example, in the machine factory, there were rolls of movie film, a projector, all sorts of machine tools, tools and instruments, and documents left over. We even held a screening of a film they discovered, and Professor Tachibana made a commentary. It was about ten minute long, and the images weren't very interesting (laughing): a flying boat--the kind of airplane that can land on water--was dropped into the water from a certain height. Next it was dropped from a little bit higher, and it came down with a big splash. It was a film where that [experiment] was repeated.

After that, the important machine tools were donated to the Museum of Industrial Technology at the Nippon Institute of Technology. Then, we also donated one to the museum in Kure (Hiroshima). There was a naval factory at Kure before the war, and it was the same type of machine tool that was used there then.

Then, there were some relatively small precision machine tools, and two of those are left at RCAST. One is a machine tool that can move in two dimensions on the X and Y-axes. Another is called a "divider" (*bunkatsuki*) or something, and it's an extremely important piece of equipment for making gears.

As for other big items, there was the wind tunnel itself, as well as the model YS-11 preserved inside. The model YS-11 was even introduced on "Project X," and it's a wooden model built on such a large scale that they say it cost 10,000,000 yen (Now kept in the National Science Museum: Editor's Note). This wind tunnel is where the YS-11 experiments were conducted.

——The wind tunnel itself is quite a museum, isn't it?

We also have the "Miscellaneous Records" and the "Indexed Records" journals in the stacks--both were issued annually in the days of the Aeronautical Research Institute. There's also the "Science and Technology Journal" from the days of the

Institute of Science and Technology. Because it's from the immediate postwar it's a poor journal, but it remains in the basement stacks of Building 13.

There are also interesting newspaper clippings in the stacks. Around 1928-1929, before the "Koken long-range research plane," designed and built by the Aeronautical Research Institute, there was a plan for a trans-Pacific flight, and there's a scrapbook of clippings from articles related to it. Because Lindbergh flew across the Atlantic, a plan to do the same--this time in the Pacific--was born. Although this research institute wasn't the main participant [in the project], it appears that some of the professors and students were involved.

In 2002, I wrote an article pursuing the question of why this plan ended in failure, using the clippings as sources. One important point that separated success from failure was the question of what to do about the standards--the safety standards for an airplane that would fly the long distance in a single hop. There are all kinds of safety standards for flight, like lift, top airspeed, how many meters of runway it would need to take off--and these seem to have been too tight. Because it was a single-hop long-distance flight aimed at a record, they wanted to load it with as much fuel as possible. But the more fuel they added, the less it could fly long distances in their experiments. So they adapted a little, then that didn't go well. In the end, it was a no-go.

How to set standards was left as an extremely important problem to the people engaged in aeronautical technology. Hidemasa Kimura, who was a graduate student involved with the project at the time, and who was also involved in developing the YS-11 after the war, wrote a methodological (and even somewhat philosophical) essay about "standards." It's a short, but extremely interesting report. I quoted a bit of it in my *The Philosophy of the Standard*. The connection between my research and the sources from this institute comes out there as well.

The Discovery of the Historical Film

Moving onto a slightly different topic, about three years ago some film was found in a safe in a room at the wind tunnel. This was most likely a film used at a lecture by German aeronautical and aerodynamics scientist Ludwig Prandtl; it shows the way whirlpools are created. The film was about what kind of whirlpools appear behind an object placed in flowing water, what kind of whirlpools results when the object rotates, and what happens when the object is in the shape of a wing. I wrote about what I learned from that in *Gakuto* [magazine].

—— "The historical film that appeared from a safe," right?

This area overlaps greatly with what I wrote in my doctoral dissertation about the history of aerodynamics. Prandtl was almost the main character in my dissertation. This is research I haven't finished yet, and I think I want to research it a little more broadly.

—— Thank you for today. Even when you leave RCAST, please continue to help us and do not give up on us (laughing).

Postscript
In March 2006, Professor Takehiko Hashimoto will end his 10-year term at RCAST; from April on, he is going to engage in research and education on the history of science and technology as a Professor of the History of Science and Technology at the Graduate School of Arts and Sciences.

(January 13, 2006)

Links

Department of History and Philosophy of Science
The University of Tokyo
http://hps.c.u-tokyo.ac.jp/index.html