Living to Learn

Interview with Eizaburo Nishibori, president of the Japan Technology Transfer Association, by Tsuneo Kuromizu

Few Japanese are as well known in as many fields as Dr. Eizaburo Nishibori. Both as scientist and engineer, he has contributed in innumerable ways to promoting Japanese industrial technology. He was especially active in promoting quality, one of the first proponents of statistical quality control in Japan and a forceful advocate who converted many Japanese companies to the cause of better-quality Japanese industrial products. He has also contributed to promoting the peaceful uses of atomic energy.

In addition to these achievements, he is known to the general public as an intrepid explorer. An avid mountaineer, he led the successful 1973 Japanese assault on Yalung Kang in the Himalayas. Even before that, he led the first Japanese team to winter in the Antarctic in 1957–58, succeeding against all odds and inspiring Japan with new hope that it could recover from the wounds of war.

Now 85 years old, Nishibori continues to be an active explorer, this time on the frontiers of science as president of the Japan Technology Transfer Association.

Eizaburo Nishibori

Question: *You have had a very varied life, changing careers every 10 years or so.*

Nishibori: Actually, when I started out, I wanted to become an engineer–someone who makes a direct contribution to improving mankind's lot–and I realized that I needed a broad scientific background for this. After all, if you are going to bridge a number of fields, you have to have a familiarity with them all. As a student, I was an avid mountaineer, and I remember having long talks with my mountaineering friends in the other sciences. When I graduated from Kyoto University in 1928, I started out as a researcher with teaching duties in physics, chemistry and electricity. This also gave me a good grounding in all of these fields.

Q: *You spent from 1936 to 1949 as an engineer at Tokyo Electric (now Toshiba).*

A: I was more interested in being an engineer than in being an academic. I wanted to do something that would yield tangible benefits. Happily, Tokyo Electric asked me if I was interested in working for them, and I jumped at the chance.

In December 1939, I went to the United States to study how to manufacture metallic vacuum tubes, spending half a year visiting RCA, GE and other places. This was my first exposure to R&D as we know it today. Until then, there was a strong inflow of both academic theory and production processes, but there was little recognition of the concept of R&D linking academic and commercial research. This may be understandable, given that Japan was so busy trying to catch up to Western technological levels, but I decided to learn the process that led to the creation of the technology.

Q: *Then in the next decade, you were involved in postwar Japanese quality control, for which you received the Deming Prize in 1954.*

A: I had been concentrating on technology. Technology links engineering as an academic discipline and as a practical production problem. These are two sides of the same coin, but they tend to be in conflict. People with book learning tend to look down on those with practical experience, and the ones with practical experience to scorn those with mere book learning. It is production technology–quality control–that resolves this conflict. As such, quality control is basic to following the market, to respecting

worker initiative, to defining the relations between suppliers and the main factory, and to managing all the departments within the factory.

Q: *Could you elaborate on that?*

A: When I first heard of statistical quality control from a scientist with the Occupation, I had no idea what he was talking about. But as I studied this new concept, I recalled that during the war, when the U.S. Air Force was bombing Tokyo at will, six incendiary bombs were dropped on my home. But they were all duds. My home was spared thanks to shoddy American quality control.

The American idea of quality control was to not trust the line workers and to require rigorous inspections. I decided that if we were going to introduce quality control in Japan, it would have to be attuned to Japanese practices.

By that I mean each worker should be responsible for inspecting his own output. In other countries, companies have quality control inspectors who are responsible for inspecting the output and rejecting defective products. Quality is seen as an inspection problem. I wanted to make every worker responsible for quality. I wanted quality to be a production problem.

This idea of making the worker responsible for his own quality does not occur to people who perceive industrial relations as strictly a contractual relationship between employer and employee. You need everybody to join forces for the shared goal of producing quality products. Everybody has a role to play, and everybody—from president to line worker—has to take the initiative in playing his role responsibly. In a way, people working at a company are like players on the same team.

I spent about 10 years traveling from company to company and preaching the gospel of quality control as I saw it. It was in these travels that the possibility of going to the Antarctic came up.

Q: *Perhaps your best-known adventure is the year you spent at the Antarctic Showa Base from February 1957 to February 1958 as the leader of the first Japanese expedition to winter at Ongul. How did this experience tie in with your research?*

A: I see research not simply as something that happens in the laboratory or in the factory but in the broader sense. And in doing this research, the most important thing is to approach it without prejudice and to simply see yourself as a disinterested observer of events. Only then can you hope to make any new discoveries. When the idea of going to the Antarctic came up, I thought what a marvelous opportunity this would be to visit the Antarctic—a little-known continent that few Japanese had ever seen.

It was also an ideal chance to see how people could cooperate, with each taking the initiative in pursuit of shared goals, which is also important, as I mentioned, in relation to quality control. This is the thread of continuity running through my efforts to convert Japanese companies to quality control and my time at the Antarctic.

Q: *Your wintering at the Antarctic 30 years ago was the first time that a Japanese research team had made a serious Antarctic effort. Can you tell us a little about the experience?*

A: Of course, I had done a lot of reading before I went, but I was very much at a loss in preparing for this, both materially and psychologically, because I had never been there. I was especially concerned about the interpersonal relations among the team members, and I was not sure how to handle this.

Happily, I had spent a lot of time in quality control emphasizing that management must respect individual initiative, and I was pretty confident that the same methods would work in the Antarctic as well. And they did. As a result, we were able to spend a peaceful, pleasant, and productive year despite the very harsh environmental conditions. And since everything went so well, I got to spend most of my time fixing the machinery and tinkering with the equipment and doing research. There were a lot of repairs to make and not very many tools or materials to work with, but we found that we could fix most of them with a little ingenuity.

Q: *And in exercising this ingenuity, I expect that your own broad background proved very helpful.*

A: The important thing is to be knowledgeable in a wide range of fields. Of course, it helps to have some specialized knowledge, but knowledge is just like a mountain. The base is broader—and has more applications—than the peak.

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Staying productive in a harsh climate: members of the Japanese expedition led by Eizaburo Nishibori which spent a year at the Antarctic.

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Next I needed the ability to understand things. Information could only be gotten from the encyclopedia or handbooks. So I just had to keep plugging away trying to understand things and trying to make them work. You have to believe in technology.

Q: *What would you say is the most important lesson you learned from your Antarctic experience?*

A: Like Robinson Crusoe, we had to make do with what was available. By adapting to our surroundings and using all of our wits and all of our abilities, we were able to find a way to do things. People generally tend to think there are certain ways things should be done. But we found it essential to rid ourselves of these assumptions and to be willing to try anything In most cases, people try something and then give up when it doesn't work. If they would just try a little harder—just try one more idea—they would probably find that the impossible is possible. I think this explorer spirit is essential.

The best epitomization of this spirit was the English when they ruled the seven seas. This was an era when young Englishmen were imbued with the explorer spirit and set out eagerly on new adventures. This same spirit also showed up in science and technology, and it was carried on in the American pioneer spirit.

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In many ways, being an explorer means being willing to fail. Trying to do something that nobody has ever done before inevitably means that some things are not going to turn out the way you think they should or the way you hope. But giving up is not the answer. There is something to be learned from every experience, and very often it turns out to be a valuable lesson.

Q: *You have been in the forefront of a number of fields. What are your current interests?*

A: The Japanese are very adventurous people. Although they did not have much opportunity to indulge this adventurousness—or to spread the word of their discoveries—when the country was closed for centuries under the Tokugawas, this does not change things. This Japanese adventurousness is self-evident if you look at the Mamiya expedition to the Kuriles in the very early 19th century.

There is also a tremendous hunger to learn more about science and technology that makes the Japanese very good researchers. For example, I have heard that there are some countries that have trouble getting enough qualified researchers to serve on their Antarctic teams, but the problem in Japan is just the opposite. We have too many good applicants, and we have to go through all the applications and pick out only the best.

Given this, I am very interested in seeing how science will advance in Japan. Science is basically a quest to know nature, and it is something that people will pursue for as long as we have the explorer spirit.

Science itself is impersonal, inherently blameless for the uses that it is put to. Both good and bad are in the technology that science is used for. As you know, I spent a considerable amount of time with the Atomic Energy Research Institute, and I am confident that the peaceful uses of nuclear energy can bring immeasurable benefits to people. Of course, if we make a mistake in applying this technology, we could well exterminate the entire human race. But I believe in human wisdom, and that our nuclear technology will not be used to destroy life on this planet. Every person is different, and I believe that it is possible to have these varied individuals join together in cooperative research to create new technologies and to build a better future.

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