

Reminiscences

The Past President- Prof. Masami Fukuoka

Interviewer: Prof. Osamu Kusakabe and Dr. Pongsakorn Punrattanasin

Date: December 2, 2006 (14:00-17:00)

Place: President's Room, the Japanese Geotechnical Society



His personal history: Born in 1917. Graduated from Civil Engineering Department, University of Tokyo in 1941. Entered Public Works Research Institute, Ministry of the Interior in the same year as a civil engineer. Made a first report at the 3rd International Conference on Soil Mechanics and Foundation Engineering in 1953. Director of the Public Works Research Institute, Ministry of the Construction (1967-1970). Professor at University of Tokyo (1971-1977). President of the International Society for Soil Mechanics and Foundation Engineering (1977-1981). Professor at Science University of Tokyo (1977-1997). President of *Public Works Research Center* (1989-1993).

Q: Thank you very much for your sparing your important time for this interview. I heard you will be ninety years old next year, but you always look so young. May I ask how you keep fit?

A: My three fundamental principles for a good health are to have good sleep, good meals and regular motions. I cook my own meals considering about good balance of nutrition and I chew well. Of course I don't drink nor smoke. And I try to do moderate exercise and take a good walk. I get up at 6 o'clock and do some navy exercise and yoga for about 10 minutes and hang from a bar. I walk for 4 km with singing and carrying a 3 kg heavy bag everyday one time each in the morning and in the afternoon. Walking is very important for maintenance of thinking power. I used to take a cold bath until a short time ago because I heard from Prof. Prakash that if we make our skin stronger, then the organs become strong. I go to bed at 9 o'clock. When I was a junior high school student, I went to school by bike all the way of 16 km. In high school, I was a swimming champion. I also played rugby and tennis. In my 40s and 50s, I played golf in the early morning approximately 120 days a year.



Prof. Fukuoka is showing his calisthenics

Q: Today, I would like to hear your story when you were in the office of president of ISSMFE for the first half part of this interview, then I would like to hear your ideas about the present and the future of the geotechnical society. To begin with, would you please talk about the story when you invited, held and managed the conference of the International Society for Soil Mechanics and Foundation Engineering in 1977 for the first time in Asia.

A: The decision to invite the conference was made at the Executive Committee Meeting of the 8th International Conference of Soil Mechanics and Foundation Engineering in Moscow. At that time, Germany also ran as a candidate, but partly because of the excellent speech by Prof. Yoshimi, Tokyo won by voting. At that time, there was a collateral condition to enable people to enter Japan from any country. The target countries were Israel, South Africa, Mainland China and Taiwan. In those days, the Japanese government did not issue visas for culture and sports for South Africa, because of their apartheid policy. At the Executive

Committee Meeting in Istanbul, however, a motion was made by a representative from the USA that the President was requested to cancel the Tokyo Conference unless the issue had been resolved in three months, and as a matter of fact, there was a crisis that the Tokyo conference might not have been held.

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I went to the Japanese Ministry of Foreign Affairs together with Prof. Nash, Secretary General, who had a close relationship with South Africa and asked for visa issuance permission for culture, but the Section Manager, who was well-versed in British affairs, would not give way. Nash thought that the Tokyo Conference should be cancelled. Then I made a lot of efforts to make him understand the importance of soil mechanics and foundation engineering by taking him to the site of the diaphragm wall construction and so on, and then he finally gave us his consent that issuing a business visa would be OK. That's how Prof. Blight, Representative of South Africa, could come to Japan.

Concerning the issue of two Chinas, two men from Chinese Embassy visited me at my laboratory in the University of Tokyo, and told me in fluent Japanese that they would not send a participant if we received anyone from Taiwan. I told them that even if we saw a participant's face or heard his name, non-Chinese people including Japanese could not tell whether he was from Mainland China or Taiwan, and we prepared a special site visit for the participants from Taiwan.

For the participants in the conference, I met each delegate from overseas at the Haneda Airport so that they would not have trouble in Japan, where English is not well understood. Meanwhile there was a happening that Nash, Secretary General, left a bag which had all the Executive Committee Meeting documents in it at customs of Haneda Airport, and we had to return to get it back in the rain.

It is costly to run a conference. It was just after the oil shock, so we had a difficulty in collecting contributions. First I asked President Togashi of the Honshu Shikoku

Bridge Authority to assume the office of Chair of the Local Organizing Committee, and paved the way for making a request for contribution. Japan Federation of Construction Contractors offered cooperation for me. Since I had once worked as a member of Mizushima Accident Investigation Board, Petroleum Association of Japan offered cooperation for me. Also, Prof. Okumura of the University of Tokyo, who was one of my classmates, worked to make Science Council of Japan co-host the conference. Consequently, the conference had a great success and we had 100 million yen surplus. It enabled me to use the money to publish a volume of case history after negotiation with the Ministry of Finance.



Q: Thank you very much. I could understand well that the conference was held overcoming various troubles and obstacles. You were elected as the president of the International Society at the Executive Committee Meeting of Tokyo Conference for the first time from Asia. Would you please tell me about it?

A: At the Moscow conference, President Peck was succeeded by President Kerisel without an opposing candidate. In the case of International Society for Soil Mechanics and Foundation Engineering, all the presidents were selected without voting since the first President Terzaghi. At the Tokyo conference, we had the first election for the president for the first time in its history. The three persons who recommended me for the presidency were Prof. Lysmer of the USA, who once stayed at the University of Tokyo, Prof. Sowers, Representative of the USA for the Executive Committee Meeting at Istanbul, and Prof. Hilf who had been friends since the establishment of the Japan-USA Natural Resource Panel which I established when I was the Director of the Public Works Research Institute. I once wrote a letter of apology saying that my English was so poor in reply to the first recommendation letter. I received a request again from President Lee of the American Society at that time, saying that poor English was not a good reason to decline their recommendation. Then, I talked with my wife, but she did not object, so I consulted the International Affairs Committee of the Japanese Society of Soil Mechanics and Foundation Engineering. Prof. Mogami and Prof. Yoshimi expressed favorable opinions, and President Gotoh at that time decided to accept the request. Then I sent my CV which was touched up by Prof. Silver who was visiting the University of Tokyo at that time to the USA, and the American Society circulated a letter of recommendation to the other member societies.

Reminiscences (continued)

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Eventually there were eight candidates who ran for the presidency and the election was a severe fight. The election system was the way to delete one candidate at one election, and at the 5th election there were three candidates left. At that time, Prof. V.F.B. de Mello (Brazil) got 21, I got 13 and Prof. Kezdi got 11. And at the 6th and the last election I won by one-vote difference. At that time of the Cold War between the East and the West, both the East and the West voted for me.

Q: It was such a dramatic victory. As I was there at the Executive Committee Meeting working for operating microphones, I remember so well the excitement of that time. The presidency of an international society is a heavy responsibility. Would you please tell me a few stories when you were President?

A: The President and the Secretary General must cooperate to work together to run an International Conference. At the first meeting with Nash after I became president, I said to him, "In Japan we have an expression of heart-to-heart communication. As I am not so good in English, I would like to go ahead in cooperation with you with this spirit of hear-to-heart communication". Then Nash said, "At the time of President J. Kerisel of France, I used to go to take French lessons. We can communicate with each other well enough in broken English." Actually a lot of people helped me in terms of language. For example, Prof. Gibson, who had been friends since he worked under the direction of Dr. Cooling, kindly edited my speech manuscript for the Stockholm conference.

Nash was such an efficient person that he drew up the minutes during the meeting and Ms. Brown, Secretary, typed the minutes immediately after the meeting, then the completed minutes were circulated to all the attendees for their confirmation, the President signed them and that's all. However, there was a backlash against his way of running a committee where he did not accept any statement unless it was based on the past minutes. At the same time, there was a lot of criticism against Nash because he used half of the income of the society. Especially, Australasia responded strongly against him and because of that Nash could not attend a regional meeting in Australasia.

There were serious clashes of opinions about the management policy for the society between Nash and me. I had declared my policy to place emphasis on TC activities and thought about establishing TCs on centrifuge, landslides and constitutive equation. But Nash was against it. I included an item on the TC establishment in the agenda for the Executive Committee Meeting in the Stockholm Conference. But Nash suddenly died just before the conference, then strong opponents disappeared and TCs were established. The president had full authority to decide establishment, modification and abolishment of TCs. Nash was very cooperative to adopt my field-oriented approach for International Conference sessions. I believed that, though we had only presentations of papers in International Conferences to prove that there was no discrepancy between the theory and the experiment result. It is very important to find out a difference between theory and actual measurement at the site and conduct a thorough investigation to identify the cause. So I published volumes of case history after the Tokyo Conference. When Nash and I were invited to Prof. Hansbo's home and had a discussion about the session program structure for the Stockholm Conference among three of us, Prof. Hansbo and I had a conflict where I advocated the theme of practical case history, whereas Prof. Hansbo advocated the theme of preservation of historical buildings. Then Nash proposed a session name of "Prediction & Performance" as a compromise.

As I said before, Prof. Nash was an extraordinarily capable person and he really worked hard in accordance with my intention for the smooth management of the society. However, he unfortunately passed away just before the Stockholm Conference. Prof. Burland kindly took over the responsibility and we could have the Conference successfully ended, for which I deeply appreciate. At the same time, it is my greatest pleasure that the Kevin Nash Gold Medal was established at the Conference.

Q: Thank you very much. I understood that there were exciting human dramas behind the management of International Conferences. Next, please tell us what you achieved as a president of the International Society.

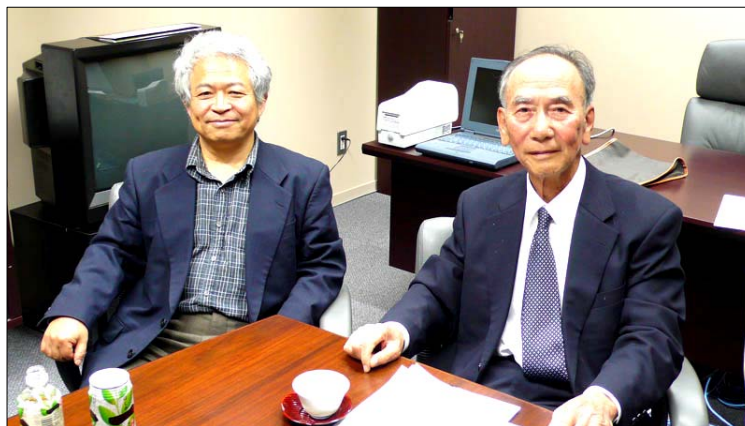
A: My basic policy for leading the society was as follows: "Soil mechanics and foundation engineering is an immature discipline. All of us have to cooperate to find out problems and solve them. There are regional meetings and symposiums besides the main conference itself. We have to submit an honest paper and discuss in a sincere manner to address the problems. We have to accept criticism for the result and carry on the research. We have to introduce the research outcomes to other people in an easy-to-understand manner. Then we put it into practical use. We use it on an actual site and disclose the outcomes. We must not take an attitude that we use a high-level theoretical computation and a complicated laboratory testing method and that we monopolize the outcomes without informing it to other people. When we release the information to the public and make it useful, for the first time it can be called a technology. Devices to be used for experiments, analysis programs, field measurement equipment are meaningful for the first time when they are available to anybody. Standard tests, computation input and models must be used commonly.

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Even when the result of a conventional testing method is not well understood mechanically, it can be used as a kind of index for engineering judgment. A method for engineering judgment is worth being reported". During the four year period of my presidency, I worked on emphasis on practicality, emphasis on regional conferences, activating TCs, establishment of management system, sound finance and maintaining two official languages system of English and French. Also I think I can add the success of the Stockholm Conference.

Concerning the emphasis of practicality, it was reflected, as I mentioned before, on publishing a volume of case history after the Tokyo Conference, and also I made a session named Prediction & Performance at the following conference. In order to emphasize the importance of regional conferences, when I was the president, I supported them by attending all the regional conferences in six regions starting with Danube meeting in Czechoslovakia. Regarding TC, I mentioned before. As a management system, I changed it from the system by executive committee, whose meetings had been held irregularly, to the system by steering committee, whose meetings were held once a year regularly. This system was renamed "Board" at the time of the next president de Mello, and ever since has been handed down to the present management system. I tried to make efficient use of membership dues and keep sound finance. Once at the Executive Committee Meeting, a proposal was made from Finland to have only one official language of English instead of having two official languages of English and French. But I sustained the two official languages. One of the reason was I placed high evaluation on the originality of papers written in French.



Professor Osamu Kusakabe and Professor Masami Fukuoka at the Japanese Geotechnical Society

Q: I understood well that you worked on various things and ensured the basis of the present International Society. At the end of the first half part, please tell us the things you cannot forget as the president of the International Society.

A: The first thing is that I was able to meet the people all over the world. Especially, though it was the time of the Cold War, the West and the East got along with each other well, and that is a nice memory. It was really impressive that I was invited to Czechoslovakia, which was part of the communist block, for the first time after I was elected as a president. The regional conference in Ghana was also very impressive. I went to the Embassy of Ghana in Tokyo to get a visa, but it was not easy. But when I referred to Mr. Degraft Johnson, who was the Vice President of Ghana and the Vice President for African Region, suddenly it expedited everything and I was able to obtain a visa. Also, in Ghana, Mr. Johnson came to the airport to meet me and I was invited to his house. I was given a big welcome with the presence of Ghana President there.

Q: Now, as the last part, I would like to ask your ideas about the present and the future. It was in 1977 that you became the President of the International Society. Now that 30 years have passed since then, what part in the geotechnical field do you find has made progress the most compared with those days?

A: In the first place, computers have come to be used for analysis and designs in practice. Dynamic analysis using FEM is a good example. At the same time, electric and electronic technology has come to be applied for instrumentation. Thereby it has become possible for us to have predictions of phenomena while we are monitoring and analyzing during the construction. As individual technologies, soil improvement technology, seismic engineering, reclamation and man-made island construction technology, and the field of shield tunnel made remarkable progress, I think.

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Q: What academic and technology fields in geotechnical engineering are most needed presently in your opinion? What the International Society should do for the purpose of developing technology fields?

A: Various geotechnical problems cannot be resolved by the geotechnical engineering field alone, or progress of geotechnical engineering and technology cannot be made by the geotechnical engineering and technology field alone either. We need to watch academic and technical progress of other fields all the time. Looking back to the past examples, FEM was what we introduced from the structural engineering field. The International Society should be more active to introduce new technologies. Especially, we need to be more positive to introduce new construction machines and chemical materials and it is important to make requests to the relevant technical fields telling what kind of construction machine and chemical materials are needed. For this purpose, education is important. New ideas are always created by young people.

Q: Do you have any opinions about how to improve the current university education?

A: It is important to teach the basics. A student who cannot understand mechanics cannot understand soil mechanics. At the same time, you cannot give good education if you do not know the construction practice. In the universities, it seems that professors exist first and then lectures are decided by the professors. Professors need to understand the practice well.

Q: These days, a gap between academic progress and on-site technology is often referred to. Do you have any ideas about the measures to make the two closer?

A: In a model experiment, we should use a model as large as prototype, or if possible, we should experiment with an actual structure. Halfway model experiments may give good exercise for researchers' brains, but you cannot expect more than that. I have made some experiments on actual river banks. My papers for the Montreal International Conference and for the Asian Regional Conference in India were about them. At present, I think that there are too many technical codes. Especially, I am afraid that ISO codes have gone too far. I believe that engineers should, not only design and construct just in line with the codes, but also consider on a case-by-case basis according to the actual site.

Also, you cannot cope with the problems at the site appropriately if you only know soil mechanics or geotechnical engineering. Besides, you have to know other technologies needed at the site. Pertaining to the laboratory test methods, a new method must be developed so that we can have the same outcome if it is done by anyone utilizing the comparative tests. As to how the comparative test should be, I once had an argument with Prof. Peck. I think we should make more use of the latest remote sensing technology. Although a lot of papers are presently published, since practical engineers who work at the sites are so busy, it is expected that collected papers published by researchers should have a function to wrap up the essence of the research outcomes to instruct how the paper can be useful from a viewpoint of practitioners. On the other hand, it is necessary to have collaborative work where a practitioner provides the field data to a researcher and the researcher publishes it as an academic achievement co-authored by the practitioner in order to unite the practitioners' experiences and academic advancement. I have an experience that I felt sorry when I published the field data of the earth pressure of the reverse T-shape retaining wall and of the retaining wall reinforced by geotextile, which I myself collected, there was no response from researchers. The collaborations and exchanges between practitioners and researchers are very important.

Q: Lastly, would you please say a word to the members of the International Society?

A: We have a lot of subjects to research. I hope that each of the members should be conscious of being a member of the society, and not only try to receive benefits from the society and use its function, but also try to give benefits to others and participate in the activities of the society.

The past president, Prof. Fukuoka told us about a large number of stories with some references and the interview went on for three hours. We were thankful to his enthusiastic attitude and also overwhelmed by his extraordinary large-scale human network, power of memory, and wealth of experiences and wisdom. The interviewers hope that the readers enjoy reading Prof. Fukuoka's stories and learning his thoughts.

Due to page limitation, some of the interesting stories had to be edited or omitted in this written version. The interviewers have full responsibility for it. Ms. Emiko Serino kindly helped us for translating from Japanese version to English.

Osamu Kusakabe & Pongsakorn Punrattanasin