

私のエッセイ MY ESSAY

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This photo was taken at the last lecture given in Tokyo Denki University on 15 March 2007

Email inaba-hiroshi@coral.broba.cc
Home Page <http://www7.plala.or.jp/hinaba/english/>
URL <http://researchmap.jp/inaba-randd/?lang=english>
新世代研究基盤データベース
URL <http://academic.research.microsoft.com/Author/51429440/hiroshi-inaba>
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FACING “KOKI”

“MILESTONES OF LIFE” AND “ENCOUNTERS WITH PEOPLE”

HIROSHI INABA, PROFESSOR EMERITUS
DEPARTMENT OF INFORMATION SCIENCES, TOKYO DENKI UNIVERSITY, JAPAN

February of the last year (2007), I celebrated my seventieth birthday, which is specifically called “koki” in Japanese, and I retired from Tokyo Denki University where I had worked for some forty years. The Chinese poet Du Fu wrote “Life to seventy is always rare”. But now koki is not rare because the average life expectancy exceeds seventy and many people over seventy are more active than younger people. However, koki was quite a big milestone in life for me. Just five years ago, two thirds of my stomach was removed because of cancer, and I had a periodic medical examination in the last February and my doctor gave me a clean bill of health, meaning that this is the last periodic examination. Therefore, if I seem to exaggerate a little, that is why I feel that my new life begins after retirement.

When I look back on the past seventy years, two aspects arose vividly: “milestones of life” which strongly directed my life and the “encounters with people” which led up to the milestones. It seems that I can divide my life into the time of childhood and being a student, the time of studying in the United States as a graduate student, and finally the time of being a professor in universities.

(1) The Childhood and Younger Days

In my childhood, I spent time in a suburb of Asahikawa city where I could enjoy a great view of the chain of Daisetsu Mountains, located in the center of Hokkaido in the northern part of Japan, but a less-cultured atmosphere. However, there was a very important encounter which strongly influenced me. That was an encounter with a young man next door who was more than ten years older than me,

liked kids, and taught me how to make a crystal radio set, a five-tube super-heterodyne radio set, and a



高校 3 年間熱心に指導して戴いた松本勇先生(1954 年)
Mr. Isamu Matsumoto,
served for 3 years as the class
teacher of Asahikawa
technical high school (1954)

wireless communication device. This encounter determined my entering into the Electrical Engineering Division of Asahikawa Technical High School. Moreover, **Mr. Isamu Matsumoto**, the teacher in charge of my class for three years in high school and furthermore a graduate from Tokyo Denki University, was very eager to teach us necessary subjects for the electrical engineering license tests conducted by the Minister of International Trade and Industry, and strongly advised us to get the third class license while in high school. This was deeply related to one of my “milestones of life”.

In fact, I got the third class license while in high school and was hired by Hokkaido Electric Power Company (one of biggest companies in Hokkaido) when I was eighteen while strongly desiring to enter a university. I was continuously trying to obtain the second class license after being positioned in a section where I was responsible for maintenance and development of more than thirty electric booster substations in the area, and I finally obtained the license at age of nineteen. After that, I was engaged in very important jobs like **upgrading of substations and construction of hydraulic power stations** because the company esteemed my licenses very highly. But, I could not give up my desire on entering university and so I quitted my job with the Hokkaido Electric Power Company where I had worked for four years even though my co-workers, friends and parents tried to make me stay, and decided to enter Department of Electrical Engineering in the College of Engineering Evening Division of Tokyo Denki University whose president was an inventor of facsimile transmission. This was the biggest decision in my adolescence and a big “milestone of life” which could not be possible without the encounter with the young man next door and Mr. Matsumoto in high school.



改良工事が完成した北海道電力北見変電所にて
(1958 年)
Reformed Kitami
Electrical Substation of
Hokkaido Electric Power
Company (1958)

I attended almost all of the classes of general academic subjects like mathematics, foreign languages, music, and economics, but rarely attended the technical classes in electrical engineering because I had studied almost all of the subjects in these classes by myself for the license examinations. At that time, I was in a financially hard situation. However, rarely attending the technical classes gave me time to have part time jobs at the Central Research Institute of Electric Power Industry or at the Tokyo Denki University Press to earn pocket money. I passed the test to change departments in the end of my second year, and enrolled in the Department of Electrical Communication Engineering in College of Engineering (daytime division). After that, I could continue to study while I had a part time job as a leading engineer in the management and maintenance of high voltage electrical substation



平松啓二教授(右)と阪本捷房学長(中央)共に四国に出張した稲葉教授(左) (1980年頃)

Travelling in Shikoku Island with Professor K. Hiramatsu (right) and President T. Sakamoto (center) (Approx.1980)

equipments in the buildings in Tokyo or the factories in the suburbs, mainly because my second class license was so much esteemed and Professor Yuhjirou Takada, Chief of the university press, and Mr. Eisaku Ohkuma, an editing manager, recommended me to those part time jobs. I wrote my graduation thesis on the theory of the parametron oscillator and its application to computers, which were very new research subjects at that time, under the instruction of Professor Kenji Funabashi, and I was able to graduate with a top grade in the department.

Then I entered the master's program in graduate school and wrote a master's thesis on pattern recognition theory and its application to speech recognition under the supervision of **Professor Keiji Hiramatsu** of the Department of Electrical Communication Engineering, and subsequently finished the master's program. It seems that this encounter with Professor Hiramatsu led to "studying in the United States" which was the

next big "milestone of life" for me.

I have gotten an official job offer from the Central Research Institute of Electric Power Industry half a year earlier before I finished my master's degree. I did not talk to Professor Hiramatsu about my employment at the institute because he was dispatched to the University of Texas at Austin by a Japan-U.S. Scientific Committee for research on machine translation just after I entered the master's program. However, he strongly advised me to decline the job and stay in university after he heard that while in the US. In the end, I decided to stay in university as an assistant who helps undergraduate laboratory courses and research in the department because I had an interest in research.

(2) Studying in USA

I remembered that I had told him that I strongly desired to study abroad in the future if possible. I heard that Professor Hiramatsu immediately explored the possibility of my entering the doctoral program in the University of Texas, and talked to the professors in charge at that time about a scholarship from Tokyo Denki University. As a result, he helped me apply as an overseas trainee to the Foundation for In-Service Training and Welfare of Private School Personnel from Tokyo Denki University, and ultimately I was accepted for half a year training to University of Texas at Austin. Until then, the application of this type of trainee had been almost always much older professors who finished administrative posts in universities. Therefore, I remembered that the manager of the foundation expressed big surprise and respect for the fact that Tokyo Denki University dispatched a young trainee (30 years old) like me when I went to the foundation with papers. I heard that efforts on behalf of President Yasujirou Nina, and the head of Academic Affaires, Professor Michio Nakano, helped make it easier for a young man like me to become the trainee. This encounter with those professors greatly influenced this "milestone of life" again.

Going abroad from Japan at that time was a tremendously big and difficult event. For instance, the money exchange rate was fixed at 360 Yen per a dollar and the dollar was very expensive, comparing with the present rate 105-120 Yen. In fact, my salary was only 36,000 Yen per a month and airfare from Tokyo to USA was about 180,000 Yen for one way, so that only a few people could go to USA. In addition, Japan's trade balance was not good as the present and further a scholar going to the USA was allowed to take only \$200, so that I had to apply a special permission from the Minister of



胸のX線写真フィルムを持って米
国行きの日本航空の機内に乗り込
む稲葉助手(1967年5月31日)
Stepping into the JAL airplane to
leave for USA with chest X-ray
film in hand (31 May 1967)

Finance for buying more dollars. Also, in order to obtain a student visa every student was required to have an interview at the American Embassy. Furthermore, each student had to have a medical checkup at a clinic or hospital in Japan designated by US Government to get an **X-ray film for chest**, which had to be taken with him to show at the US passport control. Another very interesting thing to mention is that every passenger who crossed the International Date Line on the Pacific Ocean by Japan Airline (JAL) received a certificate signed by the JAL President, stating that he or she had crossed the line at the specific time.

Next, I have to mention my experience at the University of Texas at Austin. When I first stepped on the campus at the University of Texas, it was May 31st, 1967 and I was 30 years old. Five years of studying in America were very hard mentally and financially. But, I learned a lot of things as a doctoral student for those five years from encounters with various people, not only from academic viewpoints but also daily life viewpoints, which I could not have learned in Japan. If I look back into the past now, this experience was the “biggest milestone” of my life. I also met a lot of people (including Japanese-American Mr. and Mrs. Taniguchi, host family **Mr. and Mrs. Godsey**, professors, classmates Terry Henderson, Sung Park, Larry Deuser, and exchange students from all over the world), who helped me to have a successful milestone. One of the most important encounters among them was my doctoral supervisor, **Professor Byron D. Tapley** of the University of Texas.



子供達の祖父母代わりのお世話を戴いた
ホストファミリーの Godsey 夫妻 (1975年)
Mr. & Mrs. Godsey, the host family who took
care of my children as like their grandparents

At that time, Professor Tapley had very little time since he was Chair of the Department of Aerospace Engineering and Engineering Mechanics, and NASA's manned spacecraft plan to the moon was in the final stage. When I was hired as a research assistant, Professor Tapley presented me some research subjects that were concerned with orbit determination and control of space crafts in need of a lot of computer programming work. Meanwhile, my specialty was electrical communication



テキサス大学オースチン校での指導教授 Byron D. Tapley にオースチンにあるベルギーレストランに招待される(1992年4月25日)
I was invited to a restaurant in Austin by Prof. Byron D. Tapley, who had been the Ph.D. supervisor at the University of Texas at Austin. (25 April 1992)

engineering and I did not have basic knowledge of subjects like orbital dynamics and celestial mechanics which are needed in aerospace engineering. Therefore, I was required to take classes as preliminary steps for the department and had to take a lot of classes, including some basic undergraduate classes, and the orbital dynamics, celestial mechanics, geodesy and so on. Honestly speaking, I was more interested in theoretical subjects, and was not seriously involved in the research subject using computer, which Professor Tapley had presented. My interest went to more basic subjects more than ever, and I minimized the classes for the subjects of aerospace engineering and thus took many graduate classes in Mathematics Department

(Functional analysis, Partial differential equation, Algebra, etc.). But, Professor Tapley was so generous to not point out the research theme or the subjects I took, and he helped me to study and research in theoretical area. Finally, with Professor Tapley's generous guidance along with intensive assistance in mathematical aspects from Professor R.E. Showlter of the Department of Mathematics, I could submit my dissertation on a theory of generalized random processes, which is a mathematical model of noise necessary for orbit estimation theory of spacecrafts, and I could receive my Ph. D. degree. It is obvious that my study in the United States could not be possible without an encounter with Professor Tapley.

(3) Working with Students in Universities

Now, I want to briefly mention the time when I taught in Tokyo Denki University after coming back to Japan from the University of Texas and in addition the time when I was invited to return as an assistant professor for two years by Professor Tapley to the Department of Aerospace Engineering and Engineering Mechanics in University of Texas. The encounter at this time was most of all an "encounter



テキサス大学で開催された指導教授 Byron Tapley の勤続 50 周年記念 Symposium での教授夫妻 Professor & Mrs Byron Tapley at the Symposium held in the University of Texas at Austin for celebrating his 50 years' service for the university



英国エクセター大学の Stuart Townley と Hongnian Yu 教授を訪問し、共同研究の打ち合わせを行う (1999年7月)
Visited Professors Townley and Yu of University of Exeter to discuss our joint research (July 1997)



スイス連邦工科大学の R. E. Kalman 教授 (右) を訪問してセミナーの後、夕食に招待される (1993年8月10日)
 Professor Inaba (left), visiting Professor R. E. Kalman (right) of ETH to give a seminar and invited to dinner (10 August 1993)

with students”. This was the most important resource of activities as a professor and they immeasurably contributed to my teaching and researching activities in the universities. Especially, supervising those research projects undertaken by undergraduate, master, and PhD students were collaborative works, which seemed to constitute all of my activities as a professor of universities. As time passes, these achievements of collaborative researches with students received wide recognition in and out of Japan, and we had a number of requests of collaborative research and visit to our research lab from many institutions from all over the world. Actually, collaborative research with USA,

Germany, and England became real, and tens of researchers from overseas visited our lab. Collaborative researches of these achievements were published in many high quality international journals and conferences.

Furthermore, my experience of two years being a professor at the University of Texas helped me in teaching and doing research in Japan. For example, there are few students who object to the announcement of canceled classes in Japan, but in US, students come to demand to know the reason for cancellation of classes, and some students raise objections to too many “A” grades appearing in the posted lists. Students are different from Japan and US, and I also felt much difference in professors’ attitudes toward classes. For example, in the US they



イスラエルの Fuhrman 教授夫妻(中央)と米国の Martin 教授 (右) を夕食に招待する(2001年10月)
 Professor & Mrs. Fuhrman (center) of Israel and Professor Martin (right) of USA were invited to dinner at home after Prof. Fuhrman’s seminar at Tokyo Denki University (October 2001)

use an unbelievably large amount of time for preparation of the classes, selecting problems for weekly homework, and they measure the level of understanding and give many intermediate tests, sometimes for 3 hours each in the evening, in order to have fair evaluations. I gained an amazing experience from the classes.

Here, I want to mention about my research work a little more. My research theme has been in a relatively wide range, including systems (finite dimensional,



東京電機大学で開催された第2回 COE Workshop on Human Adaptive Mechatronics (捜査能力熟達に適用するメカトロニクス研究会)に招待された外国研究者
 From left to right, Professors Magnus Egerstedt (USA), Bijoy Ghosh (USA), David Owens (UK), Clyde Martin (USA) and Hiroshi Inaba, attending the 2nd COE Workshop on Human Adaptive Mechatronics, Tokyo Denki University, 4-5 March 2005.

infinite dimensional systems, systems over rings, nonlinear system) and their control, neural networks (neural circuit) as a brain model and associative memory, nonlinear observers in machine vision (machine image recognition), random signals and signal processing. Most of these are theoretical researches, and I am often asked about possibility of applying to real problems. There would be the greatest pleasure or honor for a researcher if his or her research result is able to be applied for real problems and hopefully to greatly improve the quality of human life. But, without fear of being labeled immature or being criticized as crying sour grapes, I think the initiation of research in universities should be based on intellectual curiosity, and I also believe that if universities stress *too much* on nurturing venture companies, this initiation of research will be disregarded. I hope universities can always be intellectually one step ahead of the rest of the world.

(4) Closing Remarks

Confucius wrote in Analects: “At seventy, I could follow my heart’s desire without transgressing the norm”. Definitely, I have not reached that level of wisdom, but I hope I could continue to devote myself and progress little by little with supports of colleagues, graduated students and friends.

This present essay was originally written for the book “*Achievements of Professor Hiroshi Inaba in Memory of His Retirement*”, edited and published by the Editorial Committee for the Book of Achievements in Tokyo Denki University, and I would like to thank the editors for allowing me to use the original essay in this form. I would also like to thank Professor Quan Zhu, Chief Editor of The International Journal of Modelling, Identification and Control, for giving me an opportunity to write this essay.

Finally, I hope this essay may help younger people facing various determinations for their future plans or wrestling with their difficult problems.

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Permanent address:

2902 East Tower, 2-1-1 Fujimino West
Fujimi-City, Saitama 354-0035 Japan

Email: inaba-hiroshi@coral.broba.cc

「退任記念業績集」の編集委員 Members of Editorial Committee

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From the left, Hiroyoshi Nagata, Kaoru Kotoh, Masayasu Ito (Chief), Yoshinori Uchikawa, and Naohisa Otsuka