

News Letter

Foreign Student Service, Agriculture



グローバル化とエントロピー

松野 隆一

〔前評議員・農学研究科教授〕
応用生命科学専攻

私が学生の頃、京都―東京間は急行で8時間かかりましたが、現在では航空機の発展によって同じ時間で地球一周の四分の一を移動することができます。一方、人工衛星を使ったテレビや、インターネットの発展によって、世界のどこかで起こることを発生すると同時に見聞きすることができます。これらの物理的な手段の発達と、規制緩和をし、グローバルスタンダードに従って行動をしなければならぬという考えが次第に浸透し、様々な面でグローバル化が進んでいると良いと思います。これらのことは自然の成り行きで、調和のとれたグローバル化は大変良いことだと思います。しかしながら、アジアで起こった経済危機、通貨不安がたちまち世界に波及したことなどは、グローバル化の負の面が、深刻なものになる可能性があることを如実に示しております。又、人口の増大、人類の活動の活性化によって、一国の環境問題がただちに地球全体に波及するまでになってきていることも負の面です。私は、近年のこのような現象を見て、熱力学の第二法則“宇宙のエントロピーは増大する”という日常の出来事から発見された哲学ともいべき物理学の法則を実感しました。御周知のようにこの法則はいろいろな表現で述べられますが、“ある行為や活動をすると結果として秩序の乱れを残す”とも表現できます。ある秩序を保とうとする活動はある部分に高い秩序をもたらすことが出来ますが、世界の別のところの秩序を損ね、差し引き世界（宇宙）の秩序を乱すということです。このことは私達生活をする人間にとって深刻なことです。人間が向上し、社会を良くしようとする努力は本能的であり大事にしなければならないことです。また、人間の生きていく価値といっても過言でないと思います。それにもかかわらず、秩序を乱すという痕跡を残しながらどうしても残してしまうのです。この点から、知恵を持つ人間は謙虚でならなければならないと座右の銘のように思っています。エントロピーの増大は、扉をつなげた2つの部屋にそれぞれ異なる分子を閉じこめておき、扉を開くと自然に起こります。そして、エントロピーの増大した状態を元に戻すには多大なエネルギーが必要となります。これは、交流の閉ざされていた2つの国の間になんらかの手段によって交流が起こるとエントロピーが増大することを意味します。

グローバル化には、それから導きだされる好ましいことやメリットが多々であると思います。確かに、多様な考え方が集まることによってこれまで全く思いもつかなかった新しい飛躍的な考え方、物事、物ができるようになることは最大のメリットです。しかし、全体的な秩序をどうしても乱してしまうという面があることを常に考えておかなければならないと思います。そしてその負の面が個人、社会、国、地球にとって決定的なダメージにならないよう懸命の努力が必要です。金融のビッグバンはメリットであるとは思いますが、ビッグバンにすればそれですべて良いとすることはできず、負の面のカバーを怠ってはならないと思

います。ニューヨークの秩序が著しく良くなったと云われています。そしてそれは経済が良くなったからだとも云われていますが、裏には秩序を良くしようとする懸命の努力もあったのではないかと思います。

エントロピーの増大の負の面をカバーする方法として、国や世界の政策が不可欠ですが、エントロピーの増大の原因が、個々の人間の活動を源としていることを考えますと、最も重要なのは個々人の自覚であり、それは長期間の地道な努力ではありますが、教育によって達成されると考えます。自然科学や人文・社会科学の普遍的な原理や技術を習得することを通じて、自然に他の人のことを思いやることができ、包括的に物事を考えて我慢のできる人を育てる教育が必要なのではないかと思えます。なお、環境問題はエントロピーの増大に対する対処でありますから、このことは環境問題にもあてはまると思っています。

さて我が国は国際的な経済援助などのさまざまな努力を重ねています。その中で、教育的な援助は何十年か先に増幅して効果の表れるロングタームの援助であります。この重要さは計り知れません。NGOのボランティアの方が、スポット的な協力はできても結局は教育に帰するとよく云われますし、中国の精華大学は米国の援助があって出来上がったとのことですが、学生がそのことを良く知っています。発展途上国に、個人的に学校を建てるといふ活動をされるという立派な方がおられるのをテレビで拝見しましたが、子供たちだけでなく、たくさんの大人が字を習いに来るのを見て涙が出ました。なににも増して、戦後米国へ留学した留学生の我が国に対する影響は決して忘れることは出来ません。

私達は、身近な問題として留学生の教育に関心を持ち、環境を整え、地道な教育を行っていくことが必要と考えます。又、留学生（日本人の外国への留学生も含めて）には、普遍的な原理や技術を勉強していただくことは勿論、長い滞在期間に自分の国の持っているとは異なる文化や価値観を、自然に思いやりの目を持って見ることが出来るようになるよう習練をして欲しいと思っています。避けがたいエントロピーの増大という負の面を少しでも緩和するために！

この文を書いている間に思いついたことがあります。幸いなことにサケなどのように人には帰趨本能があるように思えます。エントロピーを物理的に考える際にはこのことを全く考えにいれません。従ってこのことがエントロピーの負の面をカバーする鍵となるのではないかと思いました。ある講演会で、ローカルグローバル化が大事だということを知りました（千畑一郎、田辺製薬（株）会長、農化昭23年卒、醸造工学研究会第40回講演会、1998年10月23日）。各地域がそれぞれの文化・科学技術、産業と特徴を持ち国際化するということが大切です。まさにこのことが願う思いがしております。



Reflections from a Visiting Professor from California

Kenneth Kazuo Tanji

(University of California, Davis)

It was an honor to be appointed a Visiting Professor in the Division of Science and Technology of the Regional Environment, Graduate School of Agriculture, Kyoto University, from July through December 1996. This was my most academically stimulating sabbatical leave for me and much was accomplished. Let me give you some details.

When I was introduced to the Faculty of Agriculture, I pointed out that Kyoto was very dear to my heart because my father spent several years here in Kyoto about 70 years ago as a disciple of Tenkko-san at Ittoen, now located in Yamashina. I also mentioned that Kyoto University is dear to my heart because my friend and colleague Professor Toshisuke Maruyama is located here.

This was my fourth trip to Japan. I was a 1984 JSPS Fellow in the Laboratory of Irrigation and Drainage, Kyoto University, and met many students and graduates of Professor Maruyama's Laboratory. Then, Professor Shintaro Kobayashi of the Laboratory of Regional Planning was the Associate Professor in the Laboratory of Irrigation and Drainage, Dr. Tsugihiko Watanabe was an Assistant Professor who is now an Associate Professor at Osaka Prefecture University, and Dr. Haruhiko Horino was a graduate student and now is the Associate Professor in the laboratory. I am acquainted with Professor Toru Mitsuno, the current professor of the laboratory, through participation International Conferences and visits to Okayama University.

My second trip to Kyoto occurred during the 14th International Congress of Soil Science in 1990. At that time, I visited the Laboratory and presented a seminar. My third trip to Japan was in 1995 when I co-chaired an International Conference on Desert Technology at Fuji Motosuko Hotel with Professor Isao Endo, Chemical Engineering Laboratory, Riken. The proceedings of that conference at the base of Mt Fuji is found in a special issue of *Journal of Arid Lands Studies*. Prior to the conference, I met with Professor Maruyama and Dr. Watanabe to finalize plans for the Visiting Professorship.

What did I do in the six months at Kyoto University? I presented 13 lectures to students in the Division on salinity and related problems in irrigated agriculture. My goal was to provide a working knowledge so that students can go overseas to observe salinity problems and evaluate them quantitatively. Every lecture had a handout of references and lecture notes, tables, graphs, and equations. Most of the lectures had an accompanying Excel model to simulate and evaluate specific problems such as rootzone salinity, leaching fraction and relative crop yields. The lecture notes and Excel models can be obtained from the Laboratory of Irrigation and Drainage through Associate Professor Horino or Assistant Professor Kimihito Nakamura, who at that time was my Teaching Associate and doctoral graduate student.

I presented an invited paper before the International Symposium on Development of Basic Technology for Sustainable Agriculture under Saline Conditions at the Arid Lands Research Center, Tottori University. I also presented a paper before the Open Public Seminar on Soil Desertification and Salinization held in Kyoto and co-sponsored by Kinki University, Osaka Prefecture University, Kyoto University, and JALDA. Seminars were also

presented at Kinki University and Iwate University.

Professor Maruyama and I wrote a 350-page book with a title of *Physical and Chemical Processes of Soil Related to Paddy Drainage*. This book written in English was published in 1997 by Shinzansha Science and Technology. Although I had carried out some research on water quality aspects of paddy rice in California, I was not fully aware of the extensive soil physical and drainage research carried out in Japan, especially in Professor Maruyama's Laboratory. Both Professor emeritus Maruyama, who is now at Nihon University, and I are very grateful for all the help students in the laboratory gave us in producing the sketches and graphs. Hopefully, this book will be of interest to anyone dealing with paddy rice.

I might mention that I obtained a B.A. in Chemistry from the University of Hawaii and my highest earned degree prior to 1997 was an M.S. in Soil Science from University of California. At UC Davis, I worked my way up from a Staff Research position in 1958 to Professor, Step I, in 1977 and to Professor, Step VIII, highest rank at the University of California, in 1995. I also served in several administrative posts such as department chair and director of endowed foundation. So, Professor Maruyama and Dr. Horino suggested that I complete a doctor's degree here at Kyoto University during my sabbatical leave. I wrote a thesis on *Modeling Saline Drainwater Reuse by a Eucalyptus Tree Plantation in the San Joaquin Valley of California*. This is a 2-dimensional finite-element transient water and salt flow model that was calibrated and validated with field data. I successfully defended my thesis before a committee in October 1997, and was awarded the Doctor of Agricultural Science in January 1997. This was a milestone achievement for me and I am proud to be one of the 65 Dr. Agric. Sci. graduates from Professor Maruyama's Laboratory.

How did I accomplish all of the above in six months? First of all, my wife stayed back in California and I lived in Shugakuin International House where my nights were free and I was able to work almost every weekend. Secondly, I had much support from everyone in the laboratory from administrative to technical help. I have very fond memories of the graduate students who were my PC consultants and taught me an incredibly wide range of science and engineering while I tried to provide some help in their thesis work. My lectures would not have gone so smoothly without Nakamura-san's help in displaying real-time changes in the model simulation results. I appreciated the students allowing me to go to lunch with them in the cafeteria as well as weekend lunches off campus. We not only talked about science but also culture. Graduate students Kimihito Nakamura and Takao Nakagiri, who is now on the faculty at Osaka Prefecture University, were always in the laboratory when I needed help. I owe particular gratitude to Associate Professor Horino who challenged me in my thesis work. In fact, my thesis work is of higher quality than the journal publications arising from 10 years of research on agroforestry, thanks to Dr. Horino.

What are my observations? I think the faculty and students of Kyoto University are of the highest quality. The faculty and students are addressing cutting-edge research in Japan and critical applied research overseas. The graduate students here work harder at research than most of my graduate students at Davis. To be fair to my students, they take about 30 units of course work, many of them advance graduate courses, for their Ph. D. program in addition to completing a dissertation. Most of my students are supported as Research Assistants on my competitive research grants obtained externally.

My connections with Kyoto University goes deeper than I what I have pointed out so far. Professor Maruyama spent a sabbatical leave at UC Davis while I chaired the Department of Land, Air and Water Resources which had about 54 faculty members. Mr. Naoki Hayashida was my graduate student in Water Science after graduating from Professor Maruyama's Laboratory. He is

now with the Japanese Institute of Irrigation and Drainage. Another student of mine was Kazuhiko Otani who was with JICA and was a graduate of Ehime University from Professor Koichi Sato's Laboratory; Professor Sato being an alumnus of Kyoto's Irrigation and Drainage Laboratory and who had also spent a sabbatical at UC Davis. Dr. Yumei Kang, a graduate of Kyoto University's Laboratory of Soil Science, was a postdoc in my laboratory and she is now an Assistant Professor at Kochi University. More recently, Dr. Ken'ichirou Kosugi of Kyoto University's Laboratory of Erosion Control spent his sabbatical leave in our Hydrology Program. And Associate Professor Tsugihiko Watanabe, formerly from Kyoto University, also spent his sabbatical leave in my Laboratory of Chemical Hydrology.

In addition, I have been acquainted with Professor Hikaru Tsutsui in his previous position with FAO-Rome and now with Kinki University; Professor Tsutsui is also an alumnus of the Laboratory of Irrigation and Drainage. I will be participating in a joint Monbusho project in Egypt and Pakistan between Kinki

University (Prof. Tsutsui), Osaka Prefecture University (Prof. Ogino), Kyoto University (Prof. Mitsuno), and Tottori University's Arid Lands Research Center (Assoc. Prof. Otsuki); all graduates of the Laboratory of Irrigation and Drainage.

In addition to my connections with Kyoto University, I have long-term relationships with Professor emeritus Toshio Cho of Kyushu University and his son, Assistant Professor Hiroyuki Cho of Saga University as well as Professor emeritus Jiro Sugi of University of Tokyo and his grandson, Shuichi Sugi, a doctoral student at Tokyo University of Agriculture. It should be clear to you that networking is an important aspect of professional collaboration and scientific exchange. I have e-mail addresses of the students in Professor Mitsuno's Laboratory and occasionally chat with them.

In summary, I had an academically stimulating appointment at Kyoto University and a wonderful time renewing old acquaintances and making new friends. I believe that your International Academic Exchange is a huge success.

留学生の眼 (17)



住 め ば 都

David Takeda

(Fulbright Scholar
America-Harvard University
Medical School)

Looking back on the past year, it seems natural to reflect back to my original goals—what exactly did I hope to accomplish during my stay in Japan? It seems that my goals which seemed so clear at the outset got blurred during all the excitement of living in a foreign country. For one thing, I wanted to experience how scientific research is conducted in another country. Kyoto University was particularly appealing to me because it is very strong in the field of pharmacology and medicinal chemistry—two areas in which I hope to study as a doctor of medicine in the future. Therefore, I could experience research in another country in a lab that was well-known for its contribution to science. Since science is growing increasingly interdependent as more knowledge becomes available and labs become more specialized, I also was interested in learning Japanese. I saw it as a means to communicate and form relationships within the Japanese scientific community. Learning the language is also important for learning about the Japanese people and society—a culture near to my heritage yet distant from my everyday life. That seems like a lot to accomplish in one year. However, in retrospect, I realize that they are all really different aspects of the Japanese culture, and thus, my actual goal was to immerse myself in the Japanese culture and actually feel what it's like to be Japanese.

Before arriving, I heard many stories about doing scientific research in Japan. I heard about students working in the lab 25 hours a day, eight days a week, about supervisors constantly over your shoulder, and the infamous magnet board, which enables anyone to instantly track your actions and how much time you've spent in the lab. Well after a year in Japan I can honestly say that they are all true, HOWEVER, it's a lot more complicated than what it seems on the surface. I regarded their habits through my American eyes—the nine to five work ethic, separating work from play. We think that there should be a definite line between work and play, the two just don't, or shouldn't mix. Therefore, on the surface, an American just seeing how many hours Japanese scien-

tists work in the lab is deceiving. The reason why they work long hours is because the laboratory is not just a place to do work, but also a place to socialize. As a result, there is definitely a feeling of belonging within the lab group. I'm not saying that one is better than the other, but just that they are different and to understand requires looking at them from different perspectives. Our lab often eats lunch and dinner together, has daily tea together, plays softball together—not just the students but the faculty too. There are also several holiday parties filled with lots of food and all night drinking which can't help but to bond people together. Thus, much to my surprise, there is no feeling of hierarchy within the lab. There are professors, assistant professors, undergraduates and so on, but everyone communicates freely with one another in a friendly fashion. As a result, there is also no cutthroat competitiveness between fellow students, researchers, or other laboratories. It's a very collegial atmosphere, where I always feel like I can ask anyone for help anytime—student or faculty. Furthermore the idea of someone always checking on your progress via magnet board or whatever was completely dispelled for me. Each person is given the independence and possesses the motivation to determine what needs to be done in order to accomplish his/her goals.

By working in a Japanese lab I also realized how lucky I am, as a scientist, to have been born in the United States. Most scientific journals are in English and while some are translated into Japanese, there are just too many journals to be translated. Therefore international scientists must learn how to read scientific journal articles in English in order to be successful. I have a difficult time reading some journal articles and I don't know of any scientist in America who is caught up with all the information that they need to read. Thus it must be much more difficult if English is not even one's first language. Not being sufficiently proficient in English can definitely slow one's work. Even some journals that are published in Japan, and contain mainly Japanese scientists, are printed only in English so that they can be circulated internationally. Therefore scientists must also be able to write in English in order to publish in international journals so other scientists will be able to read their work. Successful research also involves collaboration with other laboratories which requires one to speak English in addition to reading and writing. It made me realize how much I take for granted having English as my native language, and appreciate scientists from countries where English is not the first language.

Back to the Japanese language. One of my fellow Fulbrighters said it best, "Why don't they use a phonetic alphabet?!" Although I studied Japanese for two years in college,

from my first day in Japan I realized that Japanese people don't speak like my textbooks. And forget about dialects. But one of main reasons I came to Japan was to learn Japanese. Although one can study Japanese culture and history through textbooks written in English, to really understand a culture one has to understand the language. I realize that now more than ever. A book only tells you one person's opinion. But what better way to learn than to actually speak and live with the Japanese people, to hear for yourself what are their views about gender, medicine, or politics. Before coming to Japan, whenever I spoke Japanese I would try to translate it to English inside my head. But after living in Japan, I realize that some things just can't be translated, it's just a feeling. There is no English equivalent for every Japanese word and vice versa. Only by living and speaking with the Japanese people did I realize these nuances. Therefore through the language I learned about emotions, expressions, and feelings that are important to Japanese people. Now I realize that it is almost impossible to study a culture, or grow near to a culture without being able to speak its language.

As my year progressed I had opportunities to speak Japanese and form friendships with Japanese students at work and at home. I discovered that these relationships are also essential to understanding the Japanese culture. In addition to daily living, we cooked together, went on trips together, and often, just hung out and talked all night. All these events enabled us to grow even closer in our relationships and understanding of what makes us all tick—through trials as well as triumphs. Every person I've met

here has something new to teach me about culture, lifestyle, philosophy, or friendship. In addition, by living in Japan, I am, in turn, able to view my own American culture from another's point of view. I came here to learn about Japanese culture, but I never considered how much I would learn about my own life. I never realized how many things I take for granted in America, and how many ideals have been ingrained in me because of the way I was brought up. Senator Fulbright said, "Educational exchange can turn nations into people, contributing as no other form of communication can to the humanizing of international relations..." In a very real way Japan for me has turned from a nation into people who I now call friends. Now when I return to America, I'm pretty certain that the Japanese tourists will look a little different to me, more than just strange people with cameras. Some of them might even be my friends.

If I had to rate my year in Japan I would have to say, "excellent." Not because I had a great time everyday learning about the Japanese culture. In fact, there were more than a few days when I wished I were anywhere else other than in Japan. I'm still not fluent in Japanese, although my Japanese improved in leaps and bounds. I didn't get enough research done to complete a manuscript, but I learned about research in Japan, I learned new experimental techniques, and my results may eventually find itself on a paper sometime in the future. I would rate my time "excellent" because I've learned about Japan through her people, and, as a result, gained a new perspective of others around me as well as of myself.

留学生室ニュース

新入留学生のためのオリエンテーションと歓迎パーティ

平成10年度、農学研究科は8ヶ国から22名の新入留学生を迎えました。4月13日、オリエンテーションに引き続き、教職員および在学留学生約150名の参加を得て、恒例の歓迎パーティが農学部大会議室で盛大に行われました。開催に当たり、農学部国際交流推進後援会、アサヒビール、キリンビール、サッポロビール、サントリー、月桂冠、宝酒造、雪印乳業、京都大学生協同組合から援助ならびに御高配を賜りましたので、感謝いたします。

農学部国際交流推進後援会の会員加入について

本年は、7月に平成10年度の会員加入のお願いを御案内いたしました。昨年度、諸事情により会費の値上げをさせていただきましたが、本年度も学内および学外の多くの方々（9月末日現在で159名、1団体）からご賛同をいただいております。

バス見学旅行

平成10年度5月21日、農学部のスクールバスを利用した日帰りのバス旅行を実施しました。日本IBM株式会社、野洲工場および滋賀県森林センターを訪問し、IBMでは、パーソナルコンピュータの基盤が製作されていく過程を見学させていただきました。また、森林センターでは、額縁などを作成しました。IBMで案内していただいた方々に、留学生から、コンピュータに関するさまざまな質問が矢継ぎ早に飛び出し、実りある一日でした。

見学旅行

平成10年度も、農学部留学生見学旅行（7月16・17・18日）を企画し、総勢14名が高松市の栗林公園と鳴門市、淡路島の牧場・震災記念公園などを訪れました。栗林公園の木々の美しさ、鳴門の雄大な渦潮、淡路島牧場での実習、震災記念公園に保存されている阪神大震災のつめ跡、完成したばかりの明石大橋など、さまざまな日本文化に触れる良い機会が得られました。

ア・ラ・カ・ル・ト

私費外国人留学生の大学院修士課程入試の結果

8月26日～28日にかけて、平成11年度大学院修士課程入試が実施されました。その結果、応用生命科学専攻2名（インドネシア・韓国）、地域環境科学専攻2名（中国・ヨルダン）の方々が私費外国人留学生として合格されました。

短期留学推進制度

平成10年度の短期留学推進制度（派遣）には3名の応募者があり、応用生命科学専攻の学生2名がウイスコンシン大学とトロント大学に派遣されることになりました。



平成10年度 見学旅行（明石大橋を背に）

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