

“Two Paradoxes in Science and Economic Growth – Are We Heading in the Right Direction?”

Thursday, May 19, 2011

10:00am-11:15pm

Hilton Washington Embassy Row

Welcome Speech

Dr. Yoshiaki Abe, *Operating Advisor of USJI / University Professor at Waseda University*

Mr. Abe gave a brief introduction to the U.S.-Japan Institute, a non-profit organization which was established by 5 prestigious Japanese Universities to connect the United States and Japan through research on security, environmental, and economic issues.

Opening Remarks

Mr. Kazuhide Ishikawa, *Minister and Deputy Chief of Mission, Embassy of Japan*

Minister Ishikawa opened up his remarks by saying that people around the Washington D.C. area are fortunate because they have the USJI as an active promoter of intellectual exchanges for issues on Japan and Japan-U.S. relations.

He reminded the audience of the fact that more than two months have passed since the Great East Japan Earthquake, and noted that Japan, thanks to support from the United States and the international community, is now shifting to the recovery stage to emerge stronger than ever, while making maximum efforts to stabilize the Fukushima Nuclear Power Plant. He emphasized that reconstruction would not be an easy task, and it would certainly require tireless efforts, as well as wisdom from the academic community.

In closing, he expressed his expectation for the seminar to provide some hope and to discuss the challenges Japan faces as it works to establish a more vibrant economy and better society.

Speaker

Dr. Hiroshi Matsumoto, *President, Kyoto University*, “Two Paradoxes in Science and Economic Growth – Are We Heading in the Right Direction?”

Background: First, Dr. Matsumoto made the observation that most people think “innovative research” is solely for promoting economic growth and a convenient lifestyle. However, Dr. Matsumoto argues that this perception of innovation and progress will cause irreversible damage, leading to the downfall of civilization or even threaten human existence, perhaps as soon as fifty years from now.

The First Paradox: “Growth towards extinction.” One of the biggest factors is the staggering rise in human population on a planet with finite resources. Dr. Matsumoto explained that **vital natural resources are expected to be depleted within 100 years** (and some in only a few decades) as developing countries, whose populations will grow most rapidly, aim to rise to developed countries’ living standards while developed countries maintain their living standards. Indeed, while developed countries’ share of resources will remain steady, growth in developing countries’ populations and living standards over the next fifty years will require approximately **2.5 times the natural resources we use today**. It will be nearly impossible to provide these resources in such a short amount of time; thus, rapid economic growth and the desire for a richer lifestyle lead to grave global issues such as environmental problems, depletion of resources, and pandemics, which could lead to our ruin.

Second Paradox: “Knowledge Towards Blindness” Dr. Matsumoto described a second paradox that hinders contemporary academic society’s ability solve our problems. The systematization of our quest for knowledge has led to too much specialization, which prevents us from effectively analyzing the issues we face from a broad perspective.

Background: Scholarship was originally born from intellectual curiosity and inquisitiveness, or a need to know and understand the environment in which we live. The Greeks’ study of philosophy, as they investigated the origin of all things, was like the trunk of a tree which eventually grew into separate branches of study. What was at first a very holistic, straightforward “tree” of scholarship turned into a **fragmented, complex tree**, so that it is no longer possible to see the trunk from the outer branches and vice versa.

Following the reductionist approach espoused by Descartes, modern scientists specialize in narrow fields due to the complexity of the issues at hand. However, **specialization has hamstrung our ability to gain good knowledge to holistically view and solve problems**. Dr. Matsumoto reminded the audience that it is fine to extend out from the trunk to the branches and twigs to understand more, but he contends that contemporary academics need to spend more time and effort studying on how their research relates to the trunk.

The Role of the Humanities and Social Sciences: As the world population and economies grow, humans continue to rely on applied science, fundamental science, and technology to provide solutions to our problems and maintain the lifestyles to which we are accustomed, attempting to ensure a “rich life through economic growth.” But as the population rapidly increases, the advances in technology and fundamental and applied science may not be able to

prevent global catastrophes due to the short timeframe as well as the insufficient amount of resources (Dr. Matsumoto estimates that the necessary resources will be depleted in 40-50 years in the worst-case scenario, 100 years at best). However, if we emphasize innovative thinking through **studying and applying the fundamental humanities and social sciences**, we would lessen the burden on technology and sciences and postpone the impending crisis.

During the Q&A session, Dr. Matsumoto explained that we can promote the study of the fundamentals by requiring those going into specialized fields to spend some time after their studies applying what they learned in general, broad academic settings. He also recommended educational exchanges and international collaboration.

An Illustration: The recent nuclear disaster in Japan illustrates the intersection of the two paradoxes. Science and technology were applied to secure energy sources to fuel nuclear power stations as a result of an increasing demand for convenient lifestyle. However, now there is a **shortage of energy resources** (example of the first paradox), and a **slow recovery due to a shortage of leaders with a holistic understanding of the network of specialists required to produce and operate power plants** (second paradox). Dr. Matsumoto stressed that science is not to blame for the disaster. The scientific knowledge was applied inappropriately: the safety standards were not determined by the technical experts, but by industry and government policymakers who stood to profit from the nuclear power plant. That factor, coupled with the desire for a better life that perpetuated the myth of nuclear power's infallible energy supply, are also responsible.

Changing Our Mentality: An old Japanese saying goes, *ware tada taru (wo) shiru*, or, "What one has is all one needs." This saying demonstrates the anti-materialistic mentality of Buddhism. The acronym MMK aptly describes the three major values that have been traditionally prized throughout Asia: ***mottanai* (prudence / un wastefulness), *mittomonai* (self-respect / pride), and *katajikenai* (gratitude – appreciation for nature and people)**. But, in today's materialistic times, MMK now unfortunately seems to stand for: ***motto* (more), *madamada* (never enough), and *katanakutya* (must win)**. In order to postpone global crises and provide more time for science and technology to solve our complex problems, we need to return to the original meaning of MMK.

Later on during the Q&A session, Dr. Matsumoto said that while he does not want to trivialize the recent tragedies in Japan, they have given the people an occasion to return to the traditional MMK values to help each other and to help rebuild Japan.

Last Word: Humans have been rushing into trouble due our short-term perspective and our desire for convenience and material gain. Now it is time to think about the future in the same way as we look at the past. Our small planet will not be able to support the increased number of people in the near future. In addition to a holistic academic approach, we must also look at utilizing resources in interplanetary space.

Space and Solar Power Stations:

Space policy is an important matter, since space development can improve people's quality of life and contribute to mitigating international environmental concerns. **Space is vast and has a large amount of resources waiting to be tapped.** The Japanese government has accepted forward-looking project proposals to help solve some of our greatest challenges. One such program is the **Solar Power Satellite (SPS) Research and Development Program**, a 5-year study in which SPS and wireless power transmission models were tested.

Concept of SPS: A solar power satellite would be placed in geostationary orbit. Electricity generated by the SPS would be transmitted to the ground through microwaves. The benefits of this energy source are 1) it is **CO2-free**; 2) in contrast to solar power plants on land, the satellite would be a **constant source of energy**; and 3) it is more **efficient than oil- or nuclear-based energy sources**.

Later in the Q&A session, Dr. Matsumoto expanded on this concept. He stressed that the project should be international in nature, and **would require government support** in the initial R&D stage until it reaches a commercial level to compete with other energy sources. The amount of time that governments and/or government space agencies will need to support the project will depend on the pricing structure of energy. If energy prices are forced down due to policies, then it will take longer for it to be widely distributed. He also assured the audience that the microwaves that would be used are no more harmful than those emitted by a cell phone.

In response to a question about the possibility of the satellite creating a more vulnerable society, e.g. large communities relying on it for energy but then the satellite is struck by space junk or a meteorite, Dr. Matsumoto explained that we would likely have more than one satellite orbiting and due to the flexibility of the radio wave energy transmission system, scientists could divert some of the waves to the affected power plant. Dr. Matsumoto added that the necessary terrestrial capture and transmission infrastructure would be required in order to do this.