

# THE UNIVERSITY OF WISCONSIN—MILWAUKEE

## FIELD STATIONS BULLETIN



---

Vol. 9, No. 1

Milwaukee, Wisconsin

Spring, 1976

---

### THE INTERNATIONAL CONGRESS OF SCIENTISTS ON THE HUMAN ENVIRONMENT, KYOTO, JAPAN, NOVEMBER 17-26, 1975 — A REPORT

The International Congress of Scientists on Human Environment was convened under the combined auspices of the Science Council of Japan; the United Nations Environmental Program (UNEP), Man and the Biosphere (MAB), the Scientists' Committee on Problems of the Environment (SCOPE) and the Special Committee on the Environment of the International Social Science Council (ISSC). The 519 participants in the Congress included 95 representing 27 countries in addition to Japan. The Congress was organized by General Secretary, Prof. Y. Fukushima for the Science Council of Japan, an elected group representing 200,000 scientists. The Congress built upon the 1970 Tokyo Symposium on Environmental Disruption of the International Social Science Council and on the 1972 UN Stockholm Conference. Impetus for the Congress originated in environmental activities since the eruption of environmental interest in 1970 to 1972 and from the appearance of organized counter-activity by industry and institutions.

The Congress was organized into four working groups:

- A. Man's Impact on Terrestrial Ecosystems
- B. Problems within the Natural Sciences (including ecology, toxicology, alternative technologies and global environmental difficulties)
- C. Problems mainly in the area of the Social Sciences (including legislative techniques, marketing mechanisms, development etc.)
- D. Problems mainly in the areas of Cultural Studies (including historical environments, cultural environments, information and education).

The conference was designed as an interdisciplinary forum to determine: How can environmental disruption be prevented and ongoing damage stopped in the context of human activities, culture, and economic necessities? The major focus was on Japanese environmental problems which serve well to illustrate the overall global situation. Problems ranged from difficulties with marine, fresh-water and terrestrial environments (including agriculture) to the urban and legislative environment. Several speakers emphasized the need to adopt new life styles in the developed countries and for the developing countries to focus on goals of quality, not quantity. The first keynote speaker, Professor Tatuio Kira, a plant ecologist, discussed the relationships between nature and human needs. He noted the opportunities inherent in utilizing natural environments in place of technology and the need to understand ecosystem function.

The Japanese were excellent and efficient hosts; sessions began and ended on time, the conference hall was attractive and spacious, and the interdisciplinary approach to the conference was promoted by the physical arrangements. English was the language of the Congress which began with several days of presentations by invited speakers who provided background for the conference activity. The keynote thought "new principles are needed for the maintenance of the human environment" originated with the Stockholm Conference. The Japanese have suffered from massive air pollution resulting from steel and petrochemical developments, from contamination of food and water by PCB's, mercury (Minamata disease), cadmium (Itai-Itai disease), and other substances as well as from extensive organic water pollution, radioactivity and noise pollution. Global problems and serious local problems throughout the world were also addressed.

K. W. Kapp, a noted Swiss economist, spoke about the need to consider resource limitations and to develop a new economics, less GNP oriented and more realistic, i.e. with a longer range approach to economic and environmental concerns. He noted that economists often do not have the necessary tools and might render the greatest service if they would remain quiet. Modern economics can no longer be concerned only with two-person market relationships. Many persons not involved in the contractual process become victims of it. The interests of future generations are not represented in the market process.

Consumer-producer decisions result in externalizing social cost and environmental damage to internalized profits. Without regulation and other techniques to reduce external costs, control will not be employed. The natural tendency is to keep entrepreneurial costs to a minimum; market systems have a built-in positive feedback increasing costs to the environment. Kapp believes that the worldwide industrial expansion of the past 25 years is just coming to an end. He doubts the value of taxes, penalties or tax reduction (all piecemeal methods), in reducing damage. Environmental protection needs more fundamental methods, primary among them is strict public control of noxious and harmful materials based on the definition of what is socially desirable in the light of human health and well-being. Market values will lose in importance as environmental problems force us to rely on values relating to human needs or well-being. The "environmental crisis will force us to replace maximizing pleasures with an imperative to minimize human suffering." Kapp stated that the environmental crisis will accentuate the new trends; it will force us to maintain interdisciplinary cooperation to find lower energy approaches and to redirect research to orientation to societal needs. (I regret to report that Professor Kapp died on April 10, a few months after the Congress.)

The detailed list of working group topics made clear the impossibility of discussing in this brief report the 160 excellent working papers. Several important observations emerged:

1. The barriers between biology and the social sciences are still evident; biological scientists need to go more than halfway to sell the ecological viewpoint and ecological needs;
2. The environmental situation throughout the world is worsening and, although there is great concern even in some of the developing countries, there is as yet little real institutional control and many cases where "environmental controls are merely tranquilizers;"
3. There is a gap between citizen understanding and the actual facts of environmental disruption; in this area public understanding is vital.

The Japanese have vast and immediate problems. Although they have a relatively efficient way of living, there is a feeling of catastrophe strengthened by recent events. Japan has a growing citizens' environmental movement, and some legal steps have been taken both to protect against injury resulting from environmental disruption, and also to provide monetary relief to the sufferers from environmental injury. A jury-type system is being formulated for evaluating new industrial development.

Other noteworthy background papers included those by Tsuru, Ui and Biswas.

Professor S. Tsuru spoke on the problems of Japan and particularly developments since 1970. His list of problems included water, air, and noise pollution,

atomic power generation, regional overdevelopment, the role of citizen movements and the progress of legislation. Tsuru noted that the rapid economic growth of Japan was responsible for the intense environmental problems. Japan produced \$12 billion GNP per each 1,000 square kilometers compared to the U.S. at \$1.44 billion and the United Kingdom at \$4 billion per 1000 K<sup>2</sup>. Likewise Japan generates 268 billion Kw hours of electricity per 1000 K<sup>2</sup> in comparison to the U.K's 100 billion and the U.S. 25 billion Kw. The same comparisons can be shown for the coefficients of paved road to cars in operation, etc. Japan is congested with automobiles despite its excellent rail service. Similarly 79% of the iron and steel industries are located on the seashore compared to only 8% in the U.S. and 22% in Europe. These figures indicate the intense industrial activity in Japan and its concentration in critical coastal areas. Although pollution, loss of wildlife species, etc. were evident in the 1950's, the first basic pollution control law for Japan was not passed until July 1967. A meeting of social scientists in 1967 seemed to be the turning point; the ISSC conference resolved that "every person is endowed with the right to a beautiful and healthful environment."

Public concern over environmental destruction is extreme and is reflected in a coined word GOGI for insults inflicted on the public. The law which serves as the basic charter for environmental control was passed in 1969; other acts related to environmental protection followed in 1970. As in every country the Japanese scientists face a practical dilemma; Tsuru mentions three problems: 1) scientific investigation is required before science can prove a cause and effect relationship, 2) the extreme specialization of science has alienated science from social needs, 3) research is often so narrowly defined that environmental damage is not recognized.

The seashore or coastal zone is of vital importance. Industry has found the shallow coast valuable for building since it can be readily filled. Industrial development not only pollutes the sea but prevents access by the citizens, many who believe that access to the sea is a human right. This problem is under legal scrutiny and in the last few years citizen groups have become very active making enormous investments of energy and time to fight "the insolence and security of office." Citizen groups have four objectives 1) prevent environmental damage in advance, 2) adopt laws giving citizens the right to a clean environment, 3) stop pollution at the source, and 4) force polluters to pay.

To resolve some of the problems they suggest: 1) reworking of zoning relative to industry, 2) assess problems in advance using groups of citizens from the region, 3) require that industry report on noxious waste, 4) maximize amount of public information on emissions, "here in Japan we have only one way to go."

Mr. J. Ui spoke on the role of citizens' movements which have developed since 1965. More and more citizens appear to prefer environmental quality to material security. He noted that the public does not trust official reports on pollution nor do they believe that there are reliable scientists. Ui looks for

pollution to increase for a time while the driving force for pollution control will be local public movements. He also noted the growing conflict between Japan and the third world in relation to the expansion of Japanese industry and potential pollution elsewhere.

Dr. M. Biswas, a Canadian, spoke on food and energy in the world and concluded that modern technology has reached the point of diminishing returns and that we cannot feed the world with North American methods. Finally Thomas Malone, (USA) Secretary General of the Scientific Committee on problems of environment of ICSU (International Council of Scientific Unions) spoke of the role of scientists, the need for some optimism and faith in our ability to proceed with an understanding of the time dimension and the need to develop relationships to natural processes.

During the following five days of special sessions many valuable ideas and concepts were expressed. Howard Odum (USA) demonstrated how all of man's activity could be described in energy terms particularly by using an energy quality concept. For example, a small amount of fertilizer stimulates better use of the sun's energy than a larger amount. He believes limitations to food production for the next 50-70 years will not be economic but social-cultural. He recommends using a "high quality" energy (oil, etc.) to magnify sunlight which is more diffuse and hence a lower quality energy. Production costs should specify net energy utilization. Odum suggests that we must use low quality energy whenever possible, i.e. that energy found in the solar beam or in natural systems; energy-wise technological methods for tertiary treatment of sewage are poor techniques. Interface ecosystems could better do the work since the more natural energy that can be added, the lower is the energy cost. We should make use of natural energy of plants. Highrise dwellings are uneconomic since energy costs are far too high. He suggests that a wise investment principle is to match fossil fuel energy with natural fuel energy using green areas maintained in functioning condition.

William Michelson, Universities of Toronto and Lund, spoke on economics of urban ecosystems noting that there has been far too little ecological work toward ameliorating problems in the city. He said that we need to distinguish symptoms from the disease; we need to know ultimate cause and effect consequences. Housing projects are rarely designed by developers or planners but more frequently by bankers. Wherever possible the population should be disaggregated. How man perceives his situation is vital. Michelson's study of urban families in highrise apartments found perception important. Those expecting to move soon had little difficulty in surviving the high-rise situation for a year or two in contrast to those who saw little opportunity for escape.

Why was high-rise housing being built in such large amounts in Toronto? It is not really what people want. Why did the developers feel that this was their only alternative? Land speculation and the restriction of sewer and water by the municipality were partly responsible, but the lending agencies play a major role.

H. Shapiro (Kyoto) spoke of the need to reverse the trend of movement to cities. Many institutions and materials are highly centralized in Japan, and the present rate of urban growth is expected to continue with explosive population increases in suburban areas until the 1980's. New employment opportunities in the suburban areas have developed, but largely suburbs are exploited. There is vast growth of apartment dwelling in Tokyo.

Other speakers noted that realistically it may not be possible to accommodate the population growth presently forecast. It is indeed dangerous to proceed on the assumption that growth can continue.

Professor Shigematsu spoke of the importance of the forest to the human life of the city and its relationship to the evolution of man. Other speakers described the relationships of vegetation and animals, insects and so forth to urban conditions in Japan. G. S. Puri (Liverpool U.K.) emphasized the importance of stress as a disease causing factor in man and the implications of increased stress in "the jungles of human concrete resulting from lights, noise, odors, etc." Puri believes the urban man is over-sensitized, that people are living on one type of pill or another. He asks, "Is man conscious of the risks he is taking?" He described modern society as one giant supermarket arranged to sell goods and values for profit.

R. C. Johnson (USA, as well as others) spoke of his admiration for the Japanese high school science teachers who have led the way in publicizing environmental disruption, in fighting for pollution control and in the development of citizen groups. On the basis of many visits to Japan, Johnson says that he "sees a new Japan with a willingness to confront facts and to name names."

R. E. Munn (Canada) cautioned about too much quantitative data. He suggests that the scientist is likely to emphasize the quantitative over the qualitative but that the sensitivity analysis should consider both. He says "computer-types may be too concerned about the program," and that the environmental impact assessment is not an adversary document.

H. Chestnut of General Electric (USA) noted the systems characteristics of cities from an engineer's viewpoint. V. A. Kovada (USSR) said that one should not consider the city as a closed system but that it has an extended relationship with agriculture and nature. H. I. Odum noted that large cities grow faster than small ones and that by obtaining rich energy sources they tend to grow even more rapidly. All cities are based on availability of rich energy, and as they run through this cheap energy cities will begin to decentralize. Unfortunately planners are still trying to make cities grow.

In the summary of legal matters, it was pointed out that there are many cases where environmental controls are merely tranquilizers. There is always the fear that a stated permissible level of pollution may become a standard.

There is a gap between citizen understanding and the facts. Understandability is vital. Measurement should be made by simple methods where possible and data accumulated in ways that the public can understand. An environmental jury system has been proposed, utilizing citizens elected from various economic and social classes. These juries would approve development plans before they could be carried out.

It is vital that the law establish the inviolable right of a citizen to a healthy environment. F. R. Anderson of the US Environmental Law Institute said the National Environmental Policy Act was the most useful, interesting, and frustrating law ever enacted in the United States. Its functioning has attracted vast interest throughout the world. Anderson believes that NEPA has:

1. caused better decisions to be made,
2. heightened public awareness and understanding of side effects,
3. forced the identification of environmental problems resulting from decisions,
4. encouraged interagency cooperation and caused changes in agency staffing,
5. resulted in basic changes in federal decision making.

The failures of NEPA include:

1. environmental impact statements are too long, too technical and too broad with inadequate analysis,
2. Congress does not use the statement procedure to examine the effects of new legislation,
3. there have been too few statements written on basic legislation such as housing legislation.

The key concept is early assessment of groups of projects. Japan, in this area, is ahead since the law there already includes some planning requirements.

As a result of my own brief visit and comments of others I add these observations:

1. The Japanese have shown good adaptation to crowding, presumably as a result of having lived in moderate densities on islands where agricultural land is limited. Until recently this agricultural land was reasonably safe from development, but it is now being shifted rapidly away from agriculture through urbanization and industrialization.
2. Industry, pushed and encouraged by government, has undergone vast growth; in the process it has produced a comfortable life for most Japanese but with all the associated problems of pollution and increased stress.
3. Public interest and participation in environmental problems referred to as "environmental disruption" is growing rapidly.

4. The Japanese have a well developed ability to adapt, to drop old patterns and to pick up new and appropriate useful ones.
5. There is little evidence of widespread knowledge of basic ecological principles. Only a very limited number of individuals appeared to recognize the complexity of biological systems. Today, the emphasis is on pollution, pollution control and effects on human health; however, there is growing concern about such matters as wildlife and environmental quality.
6. The Japanese people have a well developed sense of self control. There is little outward evidence of density stress, although there is growing evidence that people are feeling stress.
7. Japanese scientists are not consulted as frequently as are American scientists, but there is a growing feeling they can and will be utilized in solving environmental problems.

The presence of almost 100 participants from countries other than Japan suggested the broad interest in and importance of the Congress. Those from developing countries showed particular concern since their areas now lack material comforts. Japan seems to be the best place in the world to study the problems of pollution and pollutants with the economic and political interactions involved. The problems however, are worldwide; Bangkok is said to be a frightening place; marine pollution in the South China Sea is potentially as serious as it is in the Japanese Inland Sea.

In conclusion, the Japanese conference proved a significant step in bringing together many different disciplines to examine the problems of environmental disruption. As Professor Kovada expressed it, "we (the foreign participants) have a common feeling of deepest appreciation to the Japanese. The Congress was thoughtful, scientific and hopeful, a base for future congresses. It resembled ten days of an international university with an opportunity for many different programs, (disciplines), to understand each other in ways where we can work together.

As a biologist, I found the Congress stimulating and exciting. The critical ecological considerations will undoubtedly receive continued emphasis in future congresses as will the utilization of biological understanding for interpreting social and cultural problems. There was widespread agreement that environmental deterioration has been rapid and vast during the last 20 years and that although the Asian countries were not ready for the 1972 Stockholm Conference, they are reaching the point of understanding which will ready them for a major environmental conference by 1978. This Congress was not designed to produce action programs, but, before it disbanded, it moved a resolution providing for continued effort on the facts presented and discussions begun at Kyoto.

Forest Stearns  
*Department of Botany*  
*The University of Wisconsin-Milwaukee*