

Japan to lead space colonization

by Sophie Tanapura

With the Tsukuba Expo '85 coming to an end on Sept. 16, Japan, the host country, must be highly commended for having succeeded in getting across to the world its message for the 21st century. Visited by this author only recently, the Expo was one of the most exciting tributes to man's struggle to learn, master, and enhance his natural environment. Since his existence for the past 2 million years—relatively short compared to the 5 billion years of the solar system—man in different cultures and geographic locations has made science and technology the major driving force, without which mankind would not have developed to where it is today.

The IBM-Japan pavilion paid due recognition to this in their exhibit on the "Roots of Science," starting with Pythagoras among the Greeks, through Avicenna of the Islamic Renaissance in the 10th century, past Europeans such as Leonardo da Vinci of Italy, Johannes Kepler and G.W. Leibniz of Germany, the great American Benjamin Franklin, right on to other contributions of the 20th century. The Mitsubishi company took visitors in a train ride through the millions of years of the history of the Earth and on into the universe. The Fujitsu Pavilion, with its creative computer, allowed you to journey through space and time from a nebula to our solar system, down to the microscopic level of amino acids and DNA.

The pavilions, especially those of Japanese private companies and the communications networks, have been organized with the very latest technologies in such a way as to excite the younger generation about science.

The much-talked-about linear motor car, known as the "High-Speed Surface Transport" (HSST), made its first public appearance at the Tsukuba Expo. Traveling about one centimeter above the track, the HSST was designed by Japan Air Lines and Sumitomo Electric Industries. The first version (unmanned) achieved a top speed of 307.8 km/h. The second (manned) was equipped with riding comforts. The Expo '85 HSST model, the newest, makes use of aeronautical engineering and can carry 48 persons at 30km/h along a 350-meter track. All of this made the Tsukuba Expo '85 itself a city of the future in a new world.

Only 15 years before the start of the 21st century, Expo '85 brings to the fore Japan's advance investment in its effort to lead this future world as a country dedicated to science and technology, the prime movers of its national growth achievements. Some 3 trillion yen went into the Tsukuba Expo '85,

and before this, 650 million yen had already gone into the little-known area of Tsukuba. About 50 kilometers northeast of Tokyo, Tsukuba has been transformed into a futuristic city of science and technology, where you can even take a very close look at a synchrotron.

The now-famous Malaysian "Look East" policy is precisely centered around benefiting from the availability of Japanese science and technology, once the language barrier is hurdled. For that, Malaysia has successfully launched a two-year Japan Center within the structure of the University of Malaysia in Kuala Lumpur where around 100 native Malaysians (*bumiputras*) are given priority each year. Courses in Japanese and the sciences are designed to allow them to continue their university education at centers of higher learning in Japan itself. And coming to Tsukuba is the dream of many foreign science students.

Whichever Japanese pavilion you visited, you were invariably introduced to a review of the latest space technologies. The theme of conquering and colonizing space is omnipresent. Aspects of simulated space travel, robots for spaceship repair, a future space colony as well as a Moon base, were all presented.

In preparation for agriculture in space, one of the most popular wonders is the enormous single tomato plant growing on a huge trellis that has yielded some 12,000 tomatoes through conventional hydroponic culture, in which the soil is replaced with water. Using the hydroponic technique, sugar cane that grows only three meters per year in tropical and subtropical areas, reaches heights of six meters in seven months. With this technique, one muskmelon stock bearing generally only one fruit will now bear around eight melons per stock. Efficient use of light energy and water are key. As we move into space, the familiar horizontal low-energy soil cultivation will have to give way to vertical high-energy non-soil cultivation. In the meantime, high-yield hydroponic cultivation can help solve food shortage situations in desert areas or where land area is limited.

In robotics, Japan is forging 10 years ahead of the United States and the European nations, where robot development has been retarded because of unemployment problems. The Tsukuba Expo '85 was like a pageant of the world's ultra-modern robots, talking with visitors, presenting shows, and playing musical instruments. The most impressive robot achievements perhaps could be seen at the Toshiba pavilion. Six robot hands spun tops along a sword edge, a rope, and on top of a pole, all with amazingly delicate and ultra-precise movements.

However, the most disappointing part of the Tsukuba Expo '85 was the various degrees of inadequacy of most of the foreign government pavilions. Emphasis was placed on encouraging Japanese tourism to those countries, rather than participation in co-prosperity of the 21st century. Japan is preparing her next generation for the space age. How prepared is the rest of the world for this challenge?