very little technological innovation. Existing techniques are refined, but new techniques are not being adopted.

Lovins correctly points out that we need institutional changes at the local level. These will be exceedingly difficult to come by. It is instructive to look back on the attempt to substitute aluminum for copper conductors in home electric wiring in this country a number of years ago at a time of high copper prices. Aluminum would have been cheaper to use, but its adoption required a number of institutional changes which turned out to be very difficult. Building codes needed to be revised to reflect the fact that aluminum wire must be clamped more firmly than copper (otherwise heat builds up, presenting a fire hazard). Resistance on the part of the building trades to adoption of new techniques led to improper installations, fires, and abandonment of the attempt to make this seemingly small change in home construction.

In short, Amory Lovins has a simplistic view of the world. Unfortunately, policy-makers do not have sufficient time to reflect on those matters and this makes them vulnerable to the forlorn hope that our energy problems will somehow turn out to have simple and painless solutions.

Mexico and Japan: The Oil Link

JESUS AGUSTIN VELASCO*

Like suitors lining up outside the castle of a lovely princess, more and more countries are finding ways to court the newest princess of oil — Mexico. The fact that Mexico's petroleum reserves may rival those of Saudi Arabia has more than a little to do with Mexico's sudden attractiveness to the world's oil-hungry economic giants.

Mexico is in the process of seizing the historic opportunity offered by her new-found promise of oil riches to develop an innovative set of relationships. She seeks to use the brief occasion afforded by her raw material wealth to clinch for herself a place among the world powers. Mexico's extreme dependence on the United States has been seen by many as a serious problem. In reviewing new strategies for development, a major goal is to achieve pluralization of relationships to balance this legacy of dependency.

*Jesus Agustin Velasco-Siles is working toward the Ph.D. degree at The Fletcher School. Since 1971 he has worked for the government of Mexico as Director of Rural Development Programs and as Representative to the President's Secretariat of the State of Chiapas.

Japan, never shy when it comes to the mating of international commercial interests, is emerging as one of Mexico's potentially major trading and economic partners. In a sense, Japan is hoping to get the first dance at the princess' ball. A Mexico-Japan relationship makes sense from both parties' points of view. In exchange for serving as the counterweight to U.S. dominance, Japan could enjoy extensive commercial opportunities in Mexico.

Annual domestic Japanese oil production accounts for less than one day's supply to the Japanese economy, and the country must therefore import virtually all of her needs. Despite a national effort to diversify energy sources with the development of geothermal, hydroelectric, coal and nuclear power, Japan still depends on foreign sources for 91% of total energy usage. Thus, energy can be seen as the potential Achilles Heel of the Japanese economy; instability in the Middle East, where most of Japan's oil is bought, sends shudders through Japanese business and government circles. The development of other sources for oil, especially outside the Middle East, would afford increased security for Japan's immense economy.

Mexico, meanwhile, faces many of the typical problems of "oil-rich" less-developed countries. High unemployment levels, lack of technological expertise, an inadequate industrial base, and inefficient agriculture all plague the Mexican economy. These problems are compounded by Mexico's population growth rate, one of the highest in the world. (Current projections indicate that Mexico's population will grow from the current level of 62 million to 130 million by the year 2000). Mexican decision-makers realize the newly discovered oil reserves could play a large role in achieving sustained and equitable economic growth. Of course, they also realize from the examples of other oil producers, like Iran, that the process of converting oil revenues to social benefits is not automatic. On the other hand, the example of Japan's post-World War II economic miracle is not lost on Mexico's leaders.

The potential mutual benefits to a Mexico-Japan relationship took a major step forward in late-1978 when Mexican President Lopez Portillo visited Tokyo and other major Japanese cities. Following meetings with Japanese Prime Minister Fukuda and other officials, the two governments announced a number of specific agreements. Japan will provide technology to Mexico in a number of areas: railroad expansion, construction of port facilities, and capital investment in new and expanded industrial firms. The Japanese will also assist Mexico in the Alpha-Omega Project, designed to link the Mexican Atlantic and Pacific coasts through the Isthmus of Tehuantepec, thus avoiding the Panama Canal for the shipment of oil to Asia. In return, Japan will receive preferential access to Mexico's petroleum supplies.

While in Japan, President Lopez Portillo made it clear that Mexico is not content merely to sell her oil for money. Rather, Mexico wants to trade her oil for access to technology and to diversify her commercial relationships. In this sense,

the Mexico-Japan alliance makes excellent sense for both sides. Japan will obtain Mexican oil to keep her factories running, while Mexico uses Japanese technology to diversify her economy and to build for the future.