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Spain—Another Japan?

On 11 to 14 April, an international symposium in Madrid brought together some of the Western world's formulators and students of policy for science and technology. The meeting was particularly well timed, for it came at a moment of change when well-established policies were being questioned amid universal awareness of the role of technology in improving standards of living. Moreover, with a nuclear stalemate, commercial competition has become the principal arena for rivalry and the guest for prestige among nations.

For many years the United States was the world's unchallenged leader in science, and our mass production methods provided a great advantage in commercial competition. But other nations, particularly Japan, have adopted and even improved on our production methods, and such advantage as remains lies largely in high technology based on new science. Still, the aura of leadership remained, and others tended to follow us in policies for science and technology. The sudden abolishment of the President's science advisory apparatus and another devaluation of the dollar have raised questions about our status as leaders.

Impressed by our prowess in matters involving high technology, most of the advanced countries had attempted to adapt our policies to their use. These policies included emphasis on basic research at universities and large total expenditures for research and development (up to 3 percent of the gross national product). But now that our role as leader is coming under question, there is a tendency to look toward other models. An obvious alternative is Japan.

In its postwar development, Japan followed a different course from that of other advanced countries. While it supported some research at universities, it did not depend on technologies arising out of its own scientific efforts. Rather, Japan invested in foreign know-how, and then improved on it. This had the advantage that the Japanese did not pay for research that failed or for processes producing products that did not sell. In addition, they saved the many years required for R & D. Japan's example is now being followed by Spain, and Spain, in turn, may well serve as a model for other developing countries.

Spain, which is in the midst of a great industrial and construction boom and which is being hailed as "another Japan," has departed even further from U.S. policies. There is practically no research at the universities and little in industry. Government support of R & D is at the level of about 0.2 percent of the gross national product. Industrialization is heavily dependent on foreign know-how. Direct payments for royalties, patents, and the like last year amounted to $170 million. However, indirect payments (for example, participation in ownership ventures) may bring the total payments to $500 million (more than seven times governmental expenditures for R & D). This is a huge sum for a country only modestly endowed, but at present the proceeds from tourism (more than $2 billion) far exceed it.

It is difficult to argue against success, but are the present policies of Spain viable for the long term, and are they useful models for other developing countries? Probably not. Other developing countries cannot hope to earn huge sums from tourism. Spain's failure to nurture a scientific establishment consigns it to a long-term dependency on foreign expertise, to being a follower rather than a leader.

The Spanish are a proud people, and the scientists among them are now deeply frustrated. They know that, given a fair chance, they could compete well and contribute internationally, while serving their country. It is sad to see a nation that neglects its greatest natural resource—its brains.—PHILIP H. ABELSON