Cultural Technologies

In the increasingly international context of the 1990s, scientists, managers and policymakers will struggle to obtain the right mix of competition and cooperation with their trading partners. It seems clear that groups of nations that learn to cooperate, each providing their uniquely specialized skills, will be better able to compete internationally than nations that try to do it all on their own. But how will these groups form, and what will be the basis for successful partnerships? Obviously, the answers to these questions involve a complex set of economic and political variables. However, the recognition of the existence of "cultural technologies" may be a place to start.

Long-time MRS members, steeped in an interdisciplinary environment, will quickly recognize a cultural technology as one that belongs to a nation or perhaps a set of nations. This "ownership" may have arisen because a nation has a long historical tradition in a particular technology or because a nation consciously decided to excel in a certain area. When viewing materials research in an international context, as the newly formed International Materials Research Committee is doing, it is crucial to recognize the deep emotional response that a cultural technology can invoke in the host nation.

Take ceramics for example...one can visit the Tokyo museum and see ceramic objects 1,000 years old made with exquisite craftsmanship and beauty. This ancient tradition of making ceramic bowls and vases continues today, with the best craftsmanship attaining the status of "national treasure." This honor reflects the high value the Japanese place on the artisans who keep this aspect of Japanese culture alive and well. It seems only natural, then, that the Japanese should blend this old tradition with modern science to form a new high technology ceramics industry producing scissors, knives and engines for the 21st century. Following this example we could then expect that a high tech ceramics industry might eventually arise from a developing China, which taught Japan the art of making ceramics more than 1,000 years ago.

Or, take the example of nuclear energy technology...30 years ago we would have said that nuclear energy was clearly a U.S. cultural technology, and it may be so again. But the United States abandoned this technology as the solution for energy problems, many would say for good reasons. But regardless of our reasons, the French embraced this technology wholeheartedly as the solution to their energy problems. And this year the French will produce 95% of their electric power with nuclear energy. The French point with great pride to this accomplishment, which provides their electric power free from gaseous pollutants and imported oil. Traveling through France one is impressed with how well nuclear power has blended into the French culture with its great desire to preserve the visual traditions of a beautiful landscape while still admitting the trappings of modern technology. Of course we watch for the long-term outcome of this experiment. But because the French have invested so much they hold dear in this experiment, it has become theirs and the world will turn to them for this technology when the outcome becomes clearer.

The MRS Spring meeting holds many other examples of cultural technologies which thrive in the interdisciplinary environment provided by our meetings. One in particular from Mexico has been quietly growing, nurtured by MRS and fueled by the scientists at the Universidad Nacional Autónoma de Mexico (UNAM) in Mexico City. Perhaps even before the Japanese were learning how to make ceramics the Mexicans were learning how to use cement to build great buildings like the ones found in the city of Teotihuacan. Today Mexico is one of the world's largest producers of cement products. Cement is crucially important to Mexico both as an export item and as a basic material to provide housing and infrastructure for its expanding and developing population. Cement research at UNAM focuses not only on advanced technology and uses of cement but also on the materials science of the ancient cements. Another important area for Mexico is the behavior of cement and cement structures during earthquakes, which may one day lead to better earthquake-resistant materials. Mexico can be proud of its efforts to direct materials science research to its own special social and cultural concerns rather than just trying to imitate efforts of other nations.

Finally, we may ask what cultural technologies belong to the United States? I will let others answer this question in detail except for one. No one who attended the plenary address at the 1987 Spring Meeting could doubt that space science and technology should be counted as a U.S. cultural technology. The speaker, Dr. Bonnie Dunbar, materials scientist and astronaut, spoke about her joint mission with West German scientists when they performed many materials studies for the first time in microgravity. Those in the front row noticed that her eyes filled with tears when she looked at the pictures of her mission in space. At that moment I believe she touched a deep emotional chord in all the people present. She represented to us all that was
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