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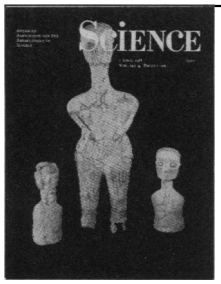

COVER Pre-Pottery Neolithic B statuary from 'Ain Ghazal, Jordan. See page 35. [Conserved by Mrs. K. Tubb, Institute of Archaeology, University of London. Photo by Peter Dorrell and Stuart Laidlaw, courtesy of Institute of Archaeology, University of London]

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Research and Development in South Korea

The newly industrialized countries of east Asia are continuing to increase their favorable balance of trade with the United States. In 1987 it was $37.7 billion versus $30.3 billion in 1986. At one time, their exports were largely labor-intensive items, but increasingly they are competitive in high-technology products. This is especially true of South Korea, which has achieved a remarkable rate of industrialization.

At the conclusion of World War II, there were only 40 people trained in science and engineering in South Korea. The Korean War that ended in 1953 was devastating. Even with some recovery, the gross national product of Korea in 1962 was only $2.3 billion (1980 dollars), and the GNP per capita was $87. In 1986 the GNP was $94 billion. More than 40,000 professional people are now employed in research and development. Many electronic devices are being produced and exported, including computers and 256K random-access memory chips. Shipbuilding is sophisticated and computer-controlled. Steelmaking facilities are among the most modern and competitive in the world today. Seven nuclear power reactors are in operation, two are under construction, and two are being designed and will be built by a Korean company.

Key to the rapid progress and a continuing momentum has been future-oriented governmental policies that have been implemented by private initiative. Beginning in 1962, a national plan for development was formulated that emphasized import substitution and exports of labor-intensive products. In the plan, the need to increase national capabilities in science and engineering was also recognized. In 1964 and shortly thereafter, Donald Hornig, the then U.S. presidential science adviser, and the Battelle Memorial Institute were helpful, aiding in crystallizing a Korean view that, for a developing country, the choice of appropriate technology can be properly made only when the importing country itself has the capability to make relevant decisions and to negotiate with the transferring country.

From the mid-1970s, the availability of trained scientists and engineers made feasible full-scale development of the heavy and chemical industries. Much of the technology that was employed came from foreign sources. But the pattern followed was to master the production process and then to move gradually into more sophisticated technology. In the early years, the Koreans were reluctant to enter joint ventures, but, as their expertise developed, participation increased greatly after 1980.

An extreme example of gradualism in taking on new technology is with respect to nuclear power reactors. The first three were obtained as turnkey products of foreign companies. However, Koreans were present in engineering studies and design work starting in 1970. Koreans participated actively in design and construction of the next six reactors, which again were the responsibility of foreign contractors. Simultaneously, Korea conducted intensive nuclear power engineering training programs. The Koreans have emphasized the need for safety and reliability in their nuclear power plants, but they feel sufficiently confident in their abilities that they will design and build two power reactors to be completed in 1996. At that time, 37 percent of the nation's electric power will come from nuclear energy.

In 1966, the then Korean President Park Chung Hee said, "In modern times development of science and technology is one of the most important factors in determining national power. Science and technology which are driving forces in the cultural development of mankind have greatly contributed toward rapid economic growth and human welfare."

Korean policy continues to take the Park statement as a given. A nationwide science movement has been launched to promote public understanding of science and technology. The country held its first "technology promotion meeting" in January 1982, presided over by the president of Korea. Cabinet ministers and representatives from relevant segments of the administrative, business, and academic sectors attended. These meetings have been held quarterly. With that kind of example, it is not surprising that young Koreans are knowledgeable about science. One recent study (see News & Comment, 11 March, p. 1237), showed that 10-year-old Koreans were tied for first place with Japanese children in knowledge of science, whereas 10-year-old U.S. children ranked 8 in a field of 15.

—PHILIP H. ABELSON