International Cooperation in High Technology

—Becoming a Technology-Based Nation Which Places Emphasis on International Contribution—

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The Japanese economy's remarkable recovery and progress after World War II has been labeled a "miracle" by an astonished world. Today, Japan ranks second only to the United States in terms of gross national product (GNP) and is sometimes called the 10% country, because its GNP accounts for 10% of the world total.

Nobody would take exception if I said Japan's technological capability has been one of the most important factors helping the country to achieve this growth (Fig. 1). This is evident from the data given below:

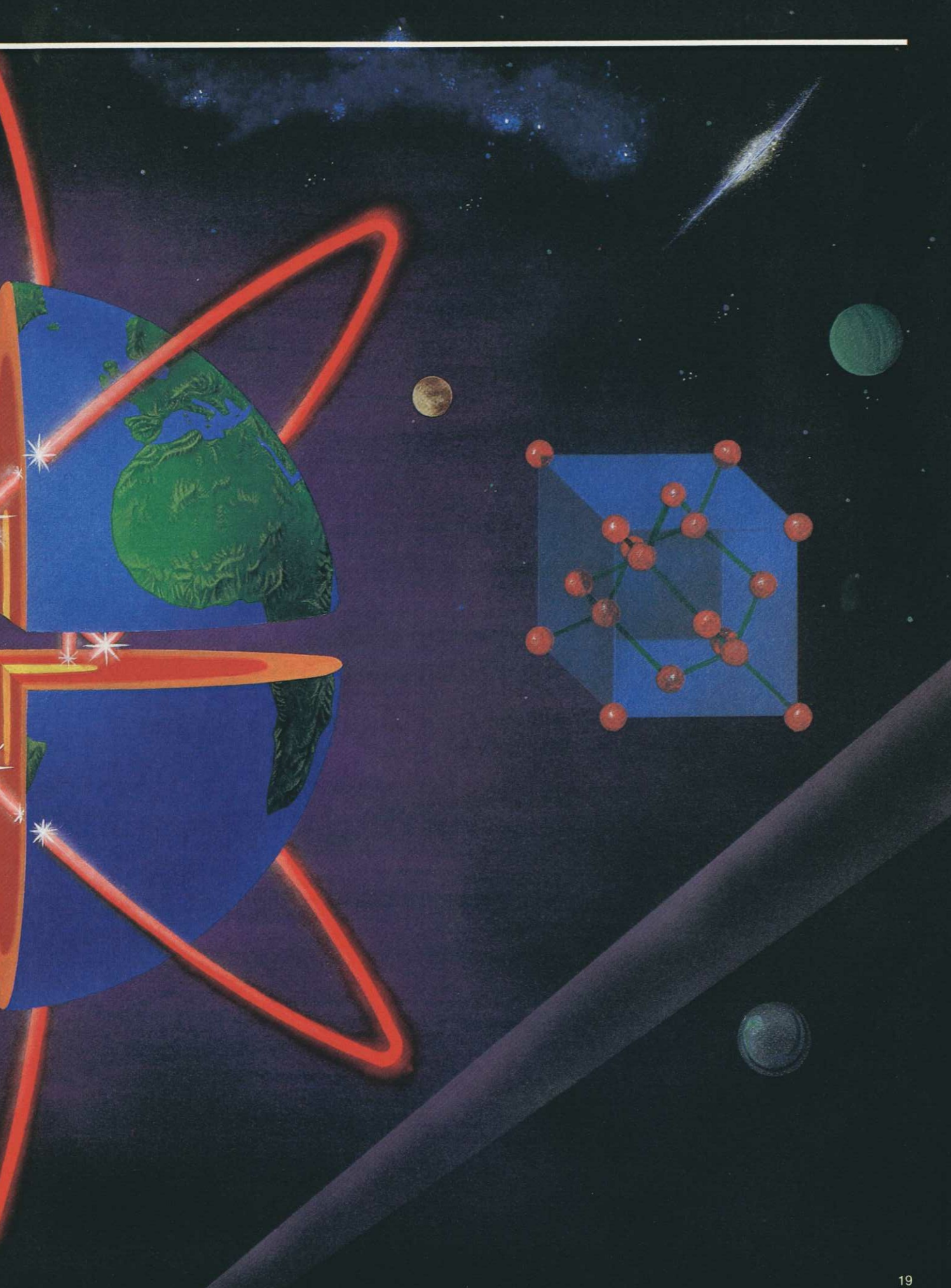
	Economic Growth Rate	Growth Rate Due to Technology
1955-60	8.7%	6.0%
1960-65	9.7	5.8
1965-70	11.6	7.0
1970-75	6.2	3.0
1975-80	5.0	3.3

Two points have often been cited as the outstanding features of Japan's technological progress. One is that Japan has depended greatly on other countries for its technical development. The other is that Japan has perceived technology principally as a means of catching up industrially with the countries of the West.

Today, there are signs that these are changing, for a number of reasons.

First, Japan has begun to lead the world in a growing number of fields, including electronics. Secondly, Japan has become increasingly aware that the ultimate aim of technological development should be to make a valuable contribution to the world.

In this context, the government's "Vision of Trade and Industry Policies for



the 1980s" states that Japan should seek to ensure its survival by becoming a technology-based nation making maximum use of brain power, which is its greatest resource, to develop innovative technology. It adds that as an economic power, Japan should "foster its creative ability and contribute positively to the world as an innovator."

In this third year of the 1980s, Japan is striving to become an internationally oriented technology-based nation by pursuing the course set out in the official "Vision." In so doing, it remains mindful to the vast currents of change at home and abroad, such as the transformations reshaping its own economic and technological capabilities and the structural changes in the world economy.

In the international society of nations, an image planted in people's minds cannot be wiped out overnight. In order to become an internationally oriented technology-based nation, Japan must first undertake technological development efforts that will be appraised highly by the rest of the world. Secondly, Japan must spare no effort in taking the international lead in the development of high technology.

Japan's Technological Development Efforts

(1) Quantitative and Qualitative Changes

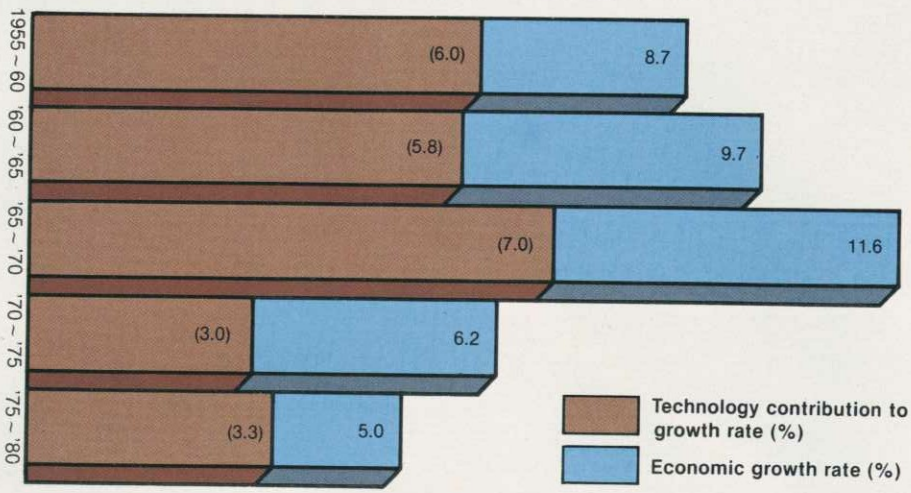
Quantitative studies show that, of all the industrially advanced countries, Japan spent the least on research and development (R&D) up to the mid-1960s. This is one of the reasons Japan has been accused of getting a free ride on foreign technology.

Japan's R&D expenditure rose sharply from the latter half of the 1960s to the early 1970s, however. Today, Japan ranks second in the free world in that respect, next only to the United States. R&D expenditure in fiscal 1981 totaled $27 billion, while the ratio of R&D expenditure to GNP in fiscal 1981 was 2.36%, on a par with the United States and second in the Free World after West Germany (Fig. 2-3).

Especially noteworthy have been Japan's technological development efforts since the oil crises, and particularly since the second one in 1978. While economic difficulties were forcing most other advanced countries to reduce their R&D efforts, Japan accelerated its own, with the rate of increase in R&D investment far exceeding the GNP growth rate (Table 1). R&D spending was particularly conspicuous in private industry. All this is evidence that Japan, having no other domestic resources worthy of mention, has become keenly aware that brains are its only resource and that its national survival lies in becoming a technology-based nation.

Next, let us look at the qualitative side of Japan's technological development

Fig. 1 Technology's Contribution to Japan's Economic Growth



According to analysis by Dr. Hisao Kanamori, president, Japan Economic Research Center
(Figures for '75-'80 include estimates.)

Fig. 2 Trends in Japan's R&D Spending

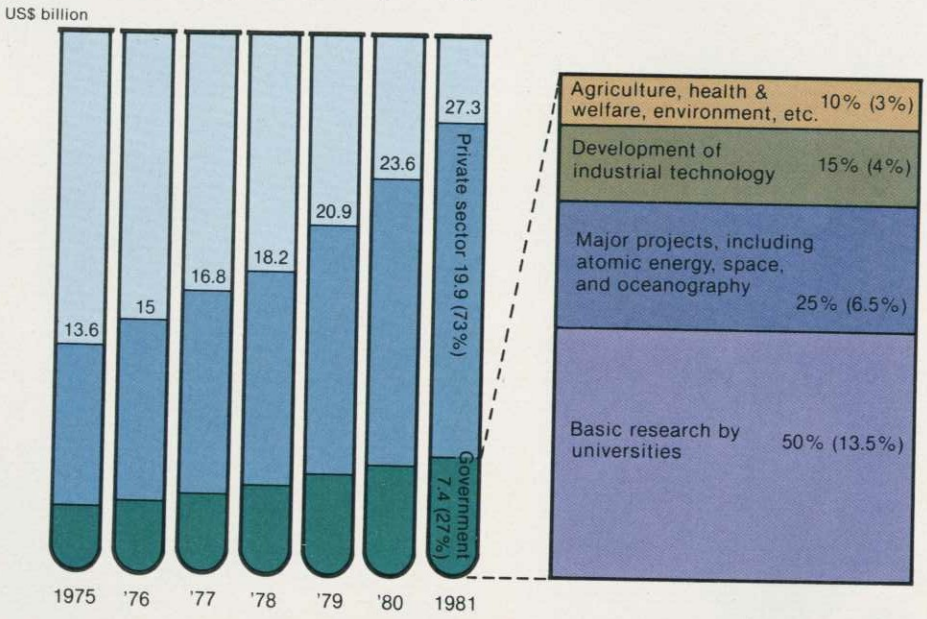


Fig. 3 National Comparison: Ratio of Research Expenditure to GNP