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uetting the Best for the Least

JAPANESE TECHNOLOGY

Masanori Moritani

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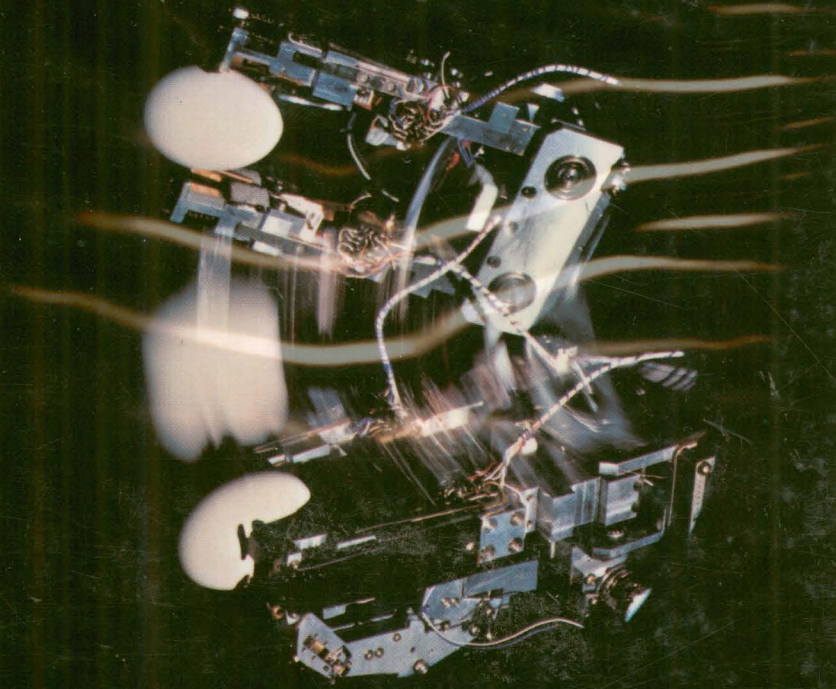
Translated by SIMUL INTERNATIONAL



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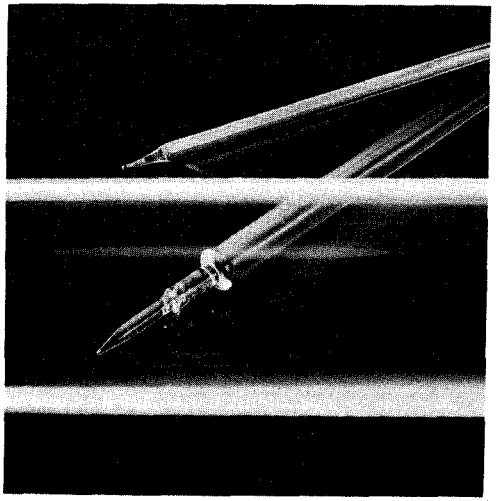

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Preface

Japan's astonishing industrial growth since the end of World War II has drawn world attention in the past 20 years. A tremendous number of treatises, even entire books, have been published both at home and abroad in an attempt to plumb the secrets of this extraordinary growth. The Japanese style of management has been one of the central themes of these publications. Japanese management has been praised as the wellspring of Japanese industry's impressive vitality.

Today, however, Japan's brilliant recovery from the 1973 oil crisis and the ever-mounting international competitiveness of its major trade products, be they automobiles, televisions, VTRs or steel, in seeming disregard of skyrocketing oil prices, have created a growing need for some new perspective from which to explain Japanese success.

Representative of these new pet explanations are the "QC

circles" employed in Japanese companies to maintain high product quality. Japan's early introduction of industrial robots and their steady diffusion throughout Japanese industry has likewise come in for special attention. Other nations have shown keen interest in the great successes of very large-scale-integrated circuit (VLSI) research and development achieved by Japanese corporations.

The Western industrialized nations have begun to feel a need to look to technological as well as managerial factors when attempting to understand Japan's success. At present, however, there are almsot no analyses of Japanese technology available outside of Japan itself. There is no dearth of articles about Japanese high technology, but these are simply introductory pieces, perhaps because, for the most part, they are written by economists who are attempting to analyze how the country works.

Nonetheless, it has finally begun to be recognized that one of the key factors behind Japan's success has been its great technological capacity. Fujitsu was the first choice among bidders for American Telephone & Telegraph Corporation's new fiber-optic transmission system, the highest of high technology. Even though the bid was eventually rejected for national security reasons, the choice symbolized the strength of Japan's technology.

The question of how modern advanced technology and industrial products interface with Japan's cultural and social milieu is one of the great remaining mysteries of the Japanese economy. To the man on the street in Europe and North America, Japan is a country long on traditional culture and brimming with Oriental exoticism. There is growing interest in how this prevailing image matches up with contemporary technology.

This book attempts to shed light on these questions. Though an engineering graduate with direct experience in the field, I have spent the past fifteen years with Nomura Research Institute, devoting myself to the wide-ranging study of technological research and development. Throughout this effort I have concerned myself with analyzing technology from a social perspective, and four years ago arrived at the concept of comparative technology as a framework for my studies. Comparative technology basically means looking at the technologies of different nations in relation to their climate for technology. In its broadest sense, it is the study of technology through cultural and historical traditions.

In this book I set out to track down, from a comparative technology perspective, the secret behind Japan's ability to produce outstanding industrial products at astonishingly low cost. In Japanese industry, in its emphasis on the place of production, we can glimpse the spirit fostered by Japan's old samurai in leading their men at the front. They did not hesitate to fight themselves, struggling and sweating alongside their men, nor do present day managers, many of whom have likewise fought their way up from the production line, put the concerns of the workplace behind them. The high level attained by the mass culture of the Edo period, a culture that was the product and possession of the common man rather than the aristocracy, can likewise be seen as still providing stimulus for the high quality of Japan's mass consumer goods, encouraging companies to work ever harder to refine their products. In much the same way, Japan's traditional craftsmanship as seen in *bonsai* and *netsuke,* the painstaking creation of delicate miniature masterpieces, is still alive today in Japan's compact and high-performance precision industrial products.

These are but a few examples of how Japan's traditional

culture remains inseparably linked to the nature of contemporary Japanese technology.

* * *

Japan today is charging full-speed into a new age of innovation. Japanese industry is intensely committed to research and development in electronics, new materials, and genetic engineering. R&D investment in the past few years has grown at a furious pace. One of the unique aspects of this new technological age, however, is the way high technology and especially electronics-based high technology, is becoming diffused throughout industry and society; we would be safe in calling this an age of technology for the masses.

There is no question that Japan, which prides itself on its nimble product development and the speed with which it puts these products into mass production, boasting an outstanding ability to produce the best for the least, will continue to grow in technological strength in the current decade. Japan already rivals the United States in R&D in such high-tech fields as VLSIs, fiber-optics communication, intelligent robots, amorphous semiconductors, carbon fibers, and fine ceramics.

Indeed, Japan's special strengths in industrialization and product improvement could well leave it in a superior position when it comes to commercializing these technologies. There is a real danger that Japan's exports will expand still further, giving rise to trade frictions in high-technology fields and further aggravating problems between Japan and the other industrial nations.

I have long been deeply concerned lest Japan's technological capacity, concentrated in a few fields with tremendous market potential, should become immensely powerful, exacerbating the problems already caused by the country's ex-

cessive strength in trade and economic affairs. I have called repeatedly for the Japanese government and Japanese industry to wake up to the country's true strength, and to act accordingly with greater leeway and confidence, sharing the responsibility for international cooperation with the other advanced nations. This is another issue that I have sought to address in this book.

In addition to the rising world interest in Japan's industrial prowess, there is a willingness evident abroad to try to learn something from the Japanese experience, but in order to do so it is important to take the time to consider the cultural, soical, and historical roots that underlie this Japanese strength. It is my hope that this book will prove of some assistance in this regard.

Many aspects of the mechanism supporting Japan's technology would be difficult to apply unchanged in other countries. Yet one of the sources of Japan's technological power is nothing other than the uniform attitude within an entire Japanese company, from president to the rank and file, of desiring to make the company better, working at their jobs with an unflagging sense of purpose. It is this solidarity that enhances the efficiency of technological development, that makes for rapid progress and allows research results to be fully utilized in commercial production, since engineers are willing to engage directly in the production side and can work in cooperation with their counterparts in product development. Is it not possible for this mechanism to be applied with some modifications to other countries outside Japan? I will be pleased if this book contributes not only to deepening understanding abroad of Japan, but to stimulating in other countries their own special characteristics and strengths, contributing in some small measure to their own technological

growth and, through this, helping to realize a more harmonious world.

This volume is based on two works written for a Japanese audience. *Kokusai hikaku: Nihon no gijutsuryoku* (Comparative Technology: Japan's Technological Strength), published by Shodensha in 1980, and *Gijutsu kyokoku: Nippon no senryaku* (Technological Superpower: Japan's Strategy), published by PHP in 1981. Both were written for the general public. The first, which became a bestseller, was in fact written with the express purpose of boosting the confidence of the Japanese in their own country. For that reason, it makes a point of stressing the positive aspects and strengths of Japan's technological environment, while pulling no punches in pointing out the problems of Europe and the United States. While I have expanded on the originals somewhat for Western readers, I trust that this current book will not be read as indulgent self-flattery, but as an attempt to explain the secrets of Japan's technological strength.

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I would like to express my deep thanks to Mr. Katsuo Tamura, President of The Simul Press, for his willingness to undertake the difficult task of publishing the English version of this book. The Simul Press has dedicated itself to facilitating harmonious communication between Japan and the rest of the world. Numerous Simul publications have aided me in my own work on this book. Again, it is an exceedingly difficult proposition to translate with total accuracy the many uniquely Japanese social and cultural concepts that appear in this work. I would like to thank the staff of Simul International who took on this difficult challenge.

Lastly, the publication of this book has been made possible by the generous support of Nomura Securities Company, the

parent firm of the Nomura Research Institute for which I work. Nomura Securities is putting the greatest effort into facilitating the internationalization of Japanese enterprises and industry. It has prepared numerous English-language movies, monthly reports and studies, and is committed to helping Japanese industry become better known and understood abroad. This book is one link in this effort. I would like to thank all those in Nomura Securities who have helped to make this publication possible.

Masanori Moritani

Tokyo
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