

Q.Y. Yu, *The Implementation of China's Science and Technology Policy*. Westport, Connecticut: Quorum Books, 1999. xv, 233 pp.

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Since China's 1978 National Science Conference, the development of science and technology has been a high priority objective of the Chinese government. In the early post-Mao years, the focus of policy was on re-establishing a system which had been severely disrupted by the Cultural Revolution. By the middle of the 1980s, there was a recognition that the mere reestablishment of the pre-Cultural Revolution system would not serve China's national objectives, especially in light of the economic reforms which were also being implemented. As a result, national policy came to focus on the reform of China's system of institutions for science and technology. By the mid-1990s, reforms had had major impacts on this system, China had significantly increased its national wealth, and, as a result, it began to increase its expenditures on research and development through the support major national programs.

In *The Implementation of China's Science and Technology Policy*, Q.Y. Yu reviews the major points in this evolution of policy. He begins with a useful overview of Chinese scientific and technological development in the 1949 to 1978 period, but most of the book deals with the major developments during the 1980s and on up into the first half of the 1990s. Yu's approach is to identify the main problems with the system and then to introduce the main policy instruments used to address those problems. In his discussion of the 1980s, he includes chapters on reform of the management system, on changes in the funding of science and in personnel policies affecting scientists and engineers, and on the introduction of "technology markets" intended to encourage flows of technical knowledge by allowing commercial values to be placed on ideas. Also included are chapters on the acquisition of foreign technology and on efforts to encourage technological capabilities in Chinese enterprises.

The second half of the book focuses on developments up through the middle of the 1990s, including a discussion of key national programs which had their origins in the late 1980s such as the "Spark Program," the "863 Program" for high technology research, and the "Torch Program" for the encouragement of high-tech industrialization. This second half of the book also includes chapters on agriculture and on industrial policy as it pertains to industries relevant to infrastructure development (energy, transportation, and telecommunications) and "mainstay industries" (machinery, electronics, petrochemicals, automobiles, and

construction). Yu concludes with a discussion of nongovernmental "science and technology enterprises," and of the challenges of sustainable development.

The author is a seasoned observer of the evolution of China's science and technology policy in the reform period, and is in a position to offer informed analysis of these policies. The book is somewhat disappointing, however, in failing to deliver on this analysis. Its strengths are in providing a fairly comprehensive description of what the key policies have been. In this, it relies quite heavily on the logic and phrasing of the key policy statements themselves, and at times the reader has the sense that he is reading an official document. When the author departs from this heavy reliance on the language of the documents, he often provides keen insights into such phenomena as the assimilation of foreign technology and the ingredients for success in developing corporate technology strategies in Chinese companies. There seems to be a reluctance, however, to develop such insights into an independent critical position for assessing what these two decades of policy development had actually achieved. Thus, despite its title, the book says considerably less about the actual implementation and consequences of the policies than we might have expected and hoped for. And, in the treatment of some topics, there is more attention to the problems than to the policies intended to address them. In the discussion of sustainable development, for instance, we are given a well known account of China's severe environmental problems without getting into the difficult issues of how science and technology should be linked to sustainable development objectives.

In writing the book, Yu relies primarily on his own understanding of the story he is telling and on official policy pronouncements, as noted above. Footnotes are few, and there is very little evidence that he has probed the extant literature – in both Chinese and foreign languages – which tries to assess and evaluate the policies Yu describes. Yu thus fails to convey the sense found in the work of other observers that these policies have been uneven in their success and have also been the subject of considerable debate within China. As a result, we don't get much of a sense of the conflicts and contradictions which have swirled around science and technology policy over the past twenty years, conflicts which, in part, have reflected genuine philosophical and ideological differences and, in part, concern for the protection of institutional interests affected by policy innovation. Some of the significant issues in China's policy discourse are either ignored or understated in this study. These include debates over the degree of China's reliance on foreign technology (vs. domestic R[esearch] & D[evelopment]) for meeting technological needs, the efficacy of high profile national programs such as "863," the appropriate level of funding for R&D, the management of – and level of support for – basic research, etc.

By the end of the 1990s, China's science and technology system was changing rapidly. Expenditures were increasing, basic research was getting better established, R&D in industrial enterprises was growing, international cooperation had become well-established, and there was a vibrant commercialism to much of the activities of the technical community. *The Implementation of*

China's Science and Technology Policy is not a terribly good guide to this rapidly changing scene. On the other hand, if the new energy seen in China's science and technology at the turn-of-the-century is a product of past policies, Yu's study – as a reference for policies and policy objectives during the first two decades of the post-Mao era – will help us understand how the system got to where it is today.