BOOK REVIEW

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Mathematics Education in China: Its Growth and Development. By Frank Swetz. Cambridge, Mass., and London: MIT Press, 1974. 364 pp. US$15.00.

This book gives a general description and assessment of the main trends in mathematical education at the primary and middle-school levels in China. Swetz mentions the political, cultural and linguistic barriers encountered in the writing of such a book and, notwithstanding these limitations and the inability to obtain first-hand information by extensive research within the People's Republic of China, he has produced a clear-cut, concise and valuable book.

Its core is a study of the evolution of mathematics in the People's Republic of China, which has been brought about by a series of social and political pressures. Swetz provides the background of this study by first giving a sketchy history of the development of over 3,000 years of mathematics from the Shang dynasty (circa 1523-circa 1028 B.C.) to the Ching period (1644-1912). Early and medieval Chinese mathematics were motivated towards practical application in fields such as construction work, architecture, astronomy, calendrical science, taxation and finance; but although mathematics was considered a subject of minor importance, it is difficult to agree with Swetz's statement that "mathematical studies, even at a very elementary level were almost non-existent."

Reform in the traditional educational system originated during the decline of the Ching dynasty, when the primary importance of

mathematics as a base for a much needed science-oriented education was realized. The first significant foreign injection into Chinese mathematics was the translation of Euclid. This was the beginning of a series of diverse foreign influences, broken off, intermittently, by nationalistic desires to be freed from the shackles of foreign domination, and finally, completely, after the Cultural Revolution which began in 1966.

The modern school system established during the Manchu Government closely followed the Japanese system. The Republican period (1912-25) saw an American influence on mathematics education, chiefly due to the large number of returned students from the United States. This was followed by a political wave of nationalism under the Kuomintang regime (1925-49), which resulted in a realization of the need to modify the school curricula to reflect the needs of the nation.

Mathematical concepts and teaching methods were imported from Russia during the early communist period when more emphasis was laid on teacher training and the psychological foundations of the learning of mathematics. The Soviet influence culminated in the establishment of "Olympiad" competitions to seek out mathematical talent, and of special schools for students with such talent. However, the deficiency in an imported type of education and its alienation from the realities of Chinese society were once again felt and, in contrast to previous concepts of education as an "elitist activity," education was now geared to fulfil the industrial and socio-economic necessities of the country.

Swetz substantiates his documentation by means of syllabi, textbook lists, descriptions of the scope of subjects and subject sequences, sample lesson plans and examination papers. However, his exposition on the mathematical developments of the Cultural Revolution is rather fragmentary. Swetz points out that China's future technical skills could be gauged from an analysis of mathematics education in the schools, and he discusses the Chinese educational experience in mathematics as a model for other developing nations of the world.

The Chinese experimentation in mathematics education can be described as a success in the sense that the promotion of mathematics studies has achieved the country's goal of rapid industrialization and that within a span of 20 years, the practical application of mathematical knowledge has reached the peasants and workers who formed the bulk of the 80 per cent of the population which was illiterate when the Communists took over China. In his conclusion Swetz makes the following observations:

"Perhaps the quality of the mathematical knowledge presently being taught is debatable, but the Chinese are not concerned, for the time being, with quality.... What is important at this time is that as much of the Chinese society as possible achieves some appreciation of the power of mathematics so that this generation of worker-peasants, having been thoroughly exposed to the broad aspects of mathematics, will bring forth a generation intent on expanding this knowledge. Then a whole society, rather than a select few, will advance in mathematical potential, and through it the industrial potential of the People's Republic of China will become most formidable!"

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