INTRODUCTION

Historians of Chinese mathematics often implicitly assume that the subject matter of the Chinese discipline identified as “geometry” was identical to its Western counterpart and therefore the Chinese mathematical texts dealt with the same geometrical objects as those found, for example, in the *Elements* of Euclid. However, several scholars have recently drawn attention to a number of peculiarities of the perception of geometrical objects in traditional China. Lih Ko-wei 李國偉 devoted a paper to the concept of angle in ancient China which, he argued, was rather different from that of Euclid. In his paper he quoted the opinions of modern Chinese scholars ranging from the statement of Qian Baocong 錢寶琮 that “[the ancient Chinese] did not know how to use angles … but may have had a general notion of them”, to the categorical claim of Liu Juncan 劉君燦 that “there was no general notion of angle in China, except that of the right angle”.2

The classical Greek definitions relative to the concept of angle are found in Book 1 of Euclid’s *Elements* (Definitions 8 and 9).3 These definitions explicitly refer to other geometrical concepts, such as that of *line* (in particular, a *straight* line) and of *plane* defined earlier in the treatise (Definitions 2, 4, and 7 of Book 1). The concept of angle thus was formalised simultaneously with a set of related geometrical

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1 Early versions of this paper were read at the International Conference “From Image to Action: The Dynamics of Visual Representation in Chinese Intellectual and Religious Culture” (Paris, September 2001) and at the International bi-Annual Conference of the Taiwanese Society of the History and Philosophy of Science (Taibei, March 2002).


3 “A plane angle is the inclination to one another of two lines in a plane which meet one another and do not lie in a straight line, … and when the lines containing the angle are straight, the angle is called rectilineal” (Heath 1956: 176). Heath also mentions alternative definitions of the angle that existed in Greek tradition (176–181).
concepts, and therefore in order to investigate the discrepancies between the Chinese and Euclidean approaches to geometrical figures it would appear plausible to put under scrutiny the entire set of geometrical concepts. Such an investigation would provide a rational basis for reconstructing the ways in which “geometrical figures” were designed and used in traditional Chinese mathematics. This paper offers a preliminary discussion of geometrical diagrams found in Chinese mathematical treatises that may provide useful insights concerning the perception of geometrical figures in traditional Chinese mathematics.

DIAGRAMS IN CHINESE MATHEMATICS: THE STATE OF THE FIELD

To my knowledge, there exist no publications in Western languages devoted specifically to mathematical diagrams in China except two recent papers by K. Chemla as well as her introduction and annotations to the translation of the *Jiuzhang suanshu* (Computational procedures of nine categories). In her 1994 paper Chemla focuses on one particular aspect of Chinese mathematical diagrams, namely, on the use of colours in the commentaries of Liu Hui, while her paper of 2002 is devoted to the history of mathematical diagrams in the Song, Yuan, and Ming dynasties; however, in the latter article Chemla indiscriminately calls “diagrams” the objects belonging to two distinct (from the modern viewpoint) categories, namely, (1) the drawings featuring geometrical configurations, and (2) the numerical “tables”, that is, tabulated records of the results of computations performed with counting instruments. Her term “diagram” thus refers to all non-textual elements found in Chinese mathematical texts.

4 I.e., the mathematical tradition that existed in China prior to the introduction of Euclidean geometry by Jesuits in the early 17th century.
6 Chemla and Guo 2004: 673–684. Western authors suggested various translations of the title of the treatise, for instance, *Computational procedures in nine chapters, Nine chapters on mathematical art*, etc. In Volkov 1986 I provided arguments against the interpretations of the word *zhang* used in the title of the treatise in its modern sense (“chapter”) and suggested that the term *jiuzhang* (dubbed here as “nine categories”) was related to a universal classification scheme (and, in this particular context, to a classification of mathematical methods).
7 Although Chemla’s paper is focused on the use of colours in the mathematical work of Liu Hui (fl. ca. 263), it contains important insights pertaining to the history of Chinese mathematical diagrams in general. Some relevant observations were also published in Chemla (1997, see esp. pp. 120–121, n. 57).