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Notation, Algorithm & Derivation in Early Mathematics in China*

1. Introduction

The notation invented to express technical and quantitative concepts in fields such as mathematics and sciences,[1] is basically a type of language. The current notation adopted in mathematics, for example, is a system composed mainly of symbols, signs, marks, as well as characters.[2] As a language, such a notational system is logographic in nature. The pronunciation of the symbols in such a notational system can be readily adapted to the pronunciation of the spoken language of the user or the reader. Thus, such a notational system is by nature relatively universal. Historically, a variety of notations has been developed to express technical and quantitative concepts in a number of fields. We have in music, for example, the European staff notation in which the duration and pitch of a tone are expressed by a note symbol and its position on the staff.

In mathematics, there have been, since antiquity, two major modes for representing technical and quantitative mathematical concepts and relations, and for executing algorithms and derivations. In the mode known as the "written mode", one uses written symbols to compose equations for expressing mathematical thoughts and to exe-

* Parts of this paper were given at the Biblioteca Nazionale at the Fifth Variantology Workshop on Deep Time Relations of the Arts, Sciences, and Technologies, 5–8 November 2008 in Naples, Italy.

1 The other fields of interest are, for example, logic, music, etc.

2 Such as the Greek and Roman alphabets, as well as the Chinese characters used since antiquity.