

BRAHMAGUPTA'S KUTṬAKA AND CH'IN CHIU-SHAO'S TA-YEN (IN THE CONTEXT OF THE DEVELOPMENT OF LINEAR INDETERMINATE ANALYSIS AND REMAINDER THEOREM)

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Two neighboring civilisations had been enriching each other since the pre-Buddhist era. The sixth-seventh century's vibrant India with its emancipation of various sheds of Buddhism and mathematics with classical astronomy created deep interest in China. India's astronomers were engaged in the Board of Astronomy in the early Tang Dynasty (618-907 AD).

Verses 32 and 33 of Gaṇitāpada, the second chapter of Āryabhaṭīya of Āryabhata-1, containing 33 verses in Sanskrit, are the first generalized theory in the History of Mathematics for the solution of Linear Indeterminate Analysis (LIA). The subject became an intellectual stimulant to his able successors; Brahmagupta (598-668 AD) and Bhāskara-1 (600-680 AD), apart other commentators.

The Chinese form of LIA got its shape passing through the Sun Tzū suan –ching (280AD-473AD), the fowl's problem (475 AD -500 AD), and slowly development of ch'i-i shu (the Chinese congruence). Before its getting generalized shape in 1247 C E, I-Hsing, (623—727 C E) an erudite Buddhist Chinese astronomer, famous for ta-yen li shu calendarical system, might know the method of indeterminate analysis. Growth in enriching the methods of LIA was very consistent since early medieval India. It had its height in the early twelfth century with Bhaskara-II at its helm, Ch'in Chi'u-shao of China in the thirtieth century concretized the remainder theorem independent of the awe-inspiring Indian tradition of LIA. Before that, the history of Chinese mathematics had no credible evidence in support of a generalized theorem. I-Hsing could have used methods in solving astronomical problems as found in Ch'in Chiu-shao's theorem.

As the focus of this article is presenting the remainder theorem developed six centuries apart, a depiction of the history of LIA for the period from the Sun Tzū suan –ching (STs-c) to the final shaping of the ta-yen by Ch'in Chi'u-shao, for China (280 BCE – 1250 CE) and the same for the period of contribution Aryabhata-1, Bhaskara -1 and Brahmagupta for India (500-650 CE) concerning the 'General problem of Remainders' by Brahmgupta are considered for discussion. The contribution of other illustrious successors, Mahavira (c 850 CE), Aryabhata-II (c 950 CE) Sripati (c 1049 CE) and Bhaskara –II (1114-1185 CE) are not felt required.
