

出國報告 (India : Conference)

Participation in the International Conference “Mathematics in Ancient Times”(Satellite Conference of the International Congress of Mathematicians-2010)

服務機關：Center for General Education & Institute of History

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Abstract 摘要：

The report describes the Purpose, Procedure, and Results of a mission to India on August 27-September 1, 2010. The main goal of the mission was to participate in the International Conference "Mathematics in Ancient Times" and to deliver a paper titled "Numerical Parameters in Ancient Mathematical Problems: Examples and Reflections".

Purpose 目的：

The objective of the mission was to participate in the International Conference "Mathematics in Ancient Times", a Satellite Conference of the International Congress of Mathematicians, to deliver an invited paper titled "Numerical Parameters in Ancient Mathematical Problems: Examples and Reflections" and to discuss plans of future cooperation between the National Tsing Hua University and the Universities and Research Institutions represented at the Conference.

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Procedure 過程：

The Conference is a Satellite Conference of the International Congress of Mathematicians, the major event in the life of the international community of mathematician; the number of participants of the congresses usually amounts to several thousand people. Satellite conferences are organized in the country-organizer of the Congress, and participants of the conferences are invited by the organizers. This time the Satellite Conference on the History of Mathematics titled "Mathematics in Ancient Times" will be held at the Kerala School of Mathematics, a research institution based in Kozhikode (also known as Calicut). I am the only participant from Taiwan/Mainland China invited by the organizers.

See the Program of the Conference in Appendix 1.

See the Abstract of my paper in the Appendix 2.

The time table of my mission was as follows:

August 27 afternoon: departure from Taiwan.

August 27 night: arrival in Mumbai (India).

August 28 afternoon: arrival in Kozhikode (India), the Conference site.

August 29 morning: my presentation

August 30: the second day of the conference

August 31: departure from Kozhikode

September 01 return to Taiwan.

(Note: I did not attend the last day of the Conference and a tour due to family circumstances).

Results and Suggestions 心得及建議事項

Results: The Conference one more time demonstrated that the professional mathematicians (a number of participants were professional mathematicians working in North America and Europe) have strong interest in history of science; at the same time, the dialogue between them and the professional historians of mathematics faces a number of difficulties, due to a number of reasons. One of them is the difference between the approaches to the subject of the professional mathematicians and professional historians: if the former are mainly interested in what is called “internalist history of mathematics”, the latter are trying to apply a variety of methods including the “externalist” (viz., sociological and anthropological) approaches not always fully understood and appreciated by the mathematicians.

Suggestions: This situation may be improved if the historians of science try to offer their results to the future mathematicians and, in particular, try to make the results they obtain to the large audience of professional scientists and science educators. It appears useful to make the history of science courses compulsory to those students who major in hard sciences and also to offer introductory courses on history, sociology, and anthropology of science to those majoring in humanities, esp. graduate students. In particular, special courses which would make connections between science education and history of science should be designed for future educators.

The Conference in Kozhikode also demonstrated the potential of international cooperation with the countries belonging to the club of actively developing regional powers (India, Iran). For instance, Professor Yano (Japan) has several Master and PhD students in India who actively work on mathematical, astronomical and astrological manuscripts. Professor Bagheri (Iran) is publishing the *Ta'rikh-e Elm: Iranian Journal for the History of Science* in Teheran; each issue of this journal contains publications of European and American historians. Indian and Iranian colleagues are open for further cooperation, be it exchange of students, professors, organization of international conferences, and so on.

Appendix 1:

The program of the Conference

KERALA SCHOOL OF MATHEMATICS, KOZHIKODE

“Mathematics in Ancient Times”

A Satellite Conference of ICM 2010 from 29.08.10 to 01.09.10

TIME TABLE

Date	09.00-10.00	10.00-11.00	11.00 - 11.30	11.30-12.30	12.30 - 01.30	01.30-02.30	02.30 - 03.30	03.30-04.00	04.00-05.00
29.08.10	Registration	Yano	<i>Tea Break</i>	Bagheri	Patte	<i>Lunch</i>	Volkov	<i>Tea Break</i>	Kusuba

Date	09.30-10.30	10.30 - 11.30	11.30-12.00	12.00 - 01.00	01.00-02.30	02.30 - 03.30	03.30-04.00	04.00-05.00	
30.08.10	Hoeyrup	Ramasubramaniam	<i>Tea Break</i>	Filliozat	<i>Lunch</i>	Schappacher	<i>Tea Break</i>	Casselman	
31.08.10	TOUR								
01.09.10	Mumford	Bavare	<i>Tea Break</i>	Mallayya	<i>Lunch</i>	Montelle	<i>Tea Break</i>	Plofker	

(Source:

<https://docs.google.com/Doc?docid=0AZaoy1BREO1PZGhzanJ3NTZfMzFmZHJ3ZmNmNQ&hl=en>)

Appendix 2:

Abstract of my paper:

Numerical Parameters in Ancient Mathematical Problems: Examples and Reflections (Abstract)

By Alexei Volkov
National Tsing Hua University, Hsinchu, Taiwan

The paper departs from the assumption that a considerable number of ancient mathematical texts from Babylonian clay tablets to Vietnamese treatises of the early 20th century, often believed by modern historians of science to be “mathematical treatises” *per se*, were originally compiled for being used in educational context and thus were functionally close to mathematical textbooks and manuals rather than to modern scholarly monographs. These texts were often organized as lists of groups of problems, in which each group was related to one and the same mathematical method or algorithm. The first part of my paper will be devoted to this statement being accompanied by examples from several mathematical texts, in particular, the Chinese mathematical treatise *Jiu zhang suan shu*.

If the aforementioned assumption is correct, when compiling lists of problems the authors of the textbooks must have faced one and the same problem, namely, that of generating numerical values of the parameters employed in the problems. It is possible that some parameters were chosen randomly, yet in a number of texts the numerical values of the parameters certainly were not random. One can suggest that the selection of the parameters may have pursued different goals. One of them could have been related to the need of providing the problems with integer or relatively simple fractional answers; knowing the answers in advance would let the instructors to minimize the time necessary for evaluating the solutions of the students. The other goal may have been to provide the instructors with a tool for suggesting to the learners particular reasoning strategies. The latter procedure is discussed by modern educators as related to the concept of “didactical variable”, that is, numerical or textual particularities of the setting of problems which may shift the learners’ attention in some particular direction.

In order to exemplify the aforementioned procedures I will discuss the numerical parameters of mathematical problems found in the treatises written in ancient and medieval China (ca. the 2nd century BC – 16th century AD), and in pre-modern Vietnam (ca. the 18th – 19th century).