

# XVII INTERNATIONAL UNION FOR HISTORY AND PHILOSOPHY OF SCIENCE CONGRESS—A REPORT

The XVII Congress of the International Union for History and Philosophy of Science (IUHPS) was held at the University of California, Berkeley from July 31 to August 8, 1985. It was attended by 1000 delegates. In all twentyone Indian authors, including the 13 delegates, from India submitted papers (list appended). But eight of the authors could not attend the Congress. The Congress was inaugurated at the Zallerback auditorium of the University on Wednesday, July 31, 1985. Profs. Rojer Hahn and John L. Heilbron, Chairmen of the Local Organizing Committee, Erwin H. Hiebert, President of the International Union for the History and Philosophy of Science, Roderick B. Park, Vice-Chairman of the University spoke at the inaugural session. Prof. Thomas S. Kuhn, the author of *The Structure of Scientific Revolutions* and a well known scholar in the field of History of Science, delivered the keynote address. He remarked that a distinct shift in emphasis in the contribution of History of Science from the tenth to the present Congress was discernible. Previously, more papers used to refer to recent history of science, while those in the present Congress deal more with the institutional and social aspects of science. He said that this was possibly because science began to change society in unforeseen ways and the people became conscious of the fearful power of science. He remarked that the social consequences of science itself were too vast to be totally entrusted to scientists. The current effort is to help non-scientists understand science but in spite of this, the gap between scientists and non-scientists has widened.

The scientific deliberations beginning from August 1 were divided into symposia and scientific sessions. Under symposia there were 19 major areas. Most of the sessions were of great interest. Session 2 dealt with the German, French, Romanian, US, and British science and technological education mostly in 19-20th centuries. The Indian scene was narrated in its proper perspective. The role of the women scientists in Arab countries, India, China, America, and Russia and their contributions to science and technology were discussed (No. 4). Under cross-cultural transmission of natural knowledge (No. 6), results relating to India, East Asia and Latin America, and Islam were analysed. The Chinese and Japanese materials on the transmission of scientific and technological knowledge were presented. All the papers were prepared and presented with great care. The team spirit shown by the Chinese and the Japanese authors was exemplary. Five papers were presented in the session on critical measurement in which evaluation of science and science policy consequences, training needed for science policy specialists, behavioural models of science and their traditional techniques were discussed. In the session on History of Science—methodology and philosophy, a series of discussion took place regarding the work of Edgard Zilsel, Joseph Needham, Borshsen and their approach and interpretation.

In the scientific sessions, 11 major areas like astronomy, biology, chemistry and technologies were covered. Each session was again divided into various sub-sessions, with important ramifications. Scientific sessions on astronomy analysed the computer dating of Egyptian and Babylonian stone hinges, Halley's comet both in Indian and Chinese tradition, use of astrolabe and other Hispano-Arabic astronomical instruments, trigonometry of al-Battānī, observatory of Paris and Bera, observatory of Milan, Laplace's prediction of Pluto, and the frontier problems of astronomy. In the biology session, discussion was focussed mainly on microorganisms and materialism, spontaneous germination, medieval teaching of anatomy, methods of inoculation, interaction of surgery and medicine in the school of William and John Hunter, origin of biochemistry, research strategies in Mendelian genetics, research tradition in the early 20th century German genetics, Darwinism and its impact. In the session on Chemistry, the major topics were origin of matter from Aristotle to Ibn Sinā, gaseous state and inflammability of air, the concept of chemical combination, dyestuff and development of organic chemistry, the chemical foundation and popularization of chemistry, kinetics and early stereochemistry. The Geology session concentrated on Charles Darwin's geological observations, tectonic theory, the theory of continental drift. The mathematics session dealt with ancient Chinese and Indian mathematics used in the solution of fundamental operations including equations of the first and the second degrees, tools like calculus, analysis, the geometry of Desargue, Saccheri, Monge and their methodological significance. Leibnitz and the problem of partition, mathematical probability and insurance, number theory by George Cantor and its influence on Bertrand Russell and combinational mathematics were equally interesting. The session on Physics discussed many serious problems of physics apart from physico-mathematical problems. Some of these are mathematical methods of Isaac Newton's *Principia*, Euler's principle of mechanics, studies on atomic bomb, US policy on nuclear technology, liquefaction of permanent gases and discovery of superconductivity, the origin of solid state of physics, Lorentz's contributions to the general theory of relativity, Einstein and his contributions to science, the theory of relativity and its impact on science in other countries, early quantum theory, field theory and the other frontier problems of physics. Other topics like science and technology in Colonial India, Nazi Germany, Imperial Japan, and Medieval China, and important areas like computer, status of science, technology and engineering in the 17th, 18th, 19th and 20th centuries were also covered.

The conference gave an opportunity for cross-fertilization of thoughts, concepts and ideas of important areas apart from meeting scientists and knowing each other. It was indeed a meeting ground of scientists, historians, litterateurs, documentation specialists, and regular research workers and helped to know major publications in the field in global context.

The country report was distributed to the Congress. Dr. B. V. Subbarayappa was renominated as an assessor. Prof. A. Rahman and Dr. B. V. Subbarayappa chaired one session each.

A general feeling expressed by some of the scholars was that more and more of Indian studies-publication, specially in astronomy, mathematics and technology, should be made available. Western scholars took a lot of interest in Indian sources and studies. More effective arrangements should be made for the preparation of critical edition of original texts and their translation and distribution.

The next Congress will be held in Hamburg, West Germany in 1989. It goes without saying that even if the History of Science is not taught in the universities/institutes in India, the IUHPS Congress has certainly given a lot of boost for History of Sciences activities in our country. Some systematic work is being carried out through the efforts of the National Commission for the Compilation of History of Sciences in India working under the auspices of the Indian National Science Academy, New Delhi. But more comprehensive work is necessary as far as research on original materials is concerned. The exact nature of science and society and their mutual relationship can best be understood by studies in History of Science.

The papers submitted by the members of the Indian delegation and by Indian scholars residing outside India are listed below. Papers presented at the Congress are marked with asterisk.

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| 1. W. H. Abdi ( <i>Lucknow</i> )                              | ... 'Euclidean Geometry in India'                                     |
| *2. S. M. R. Ansari ( <i>Delhi</i> )                          | ... 'Development of Astronomical Instruments in India'                |
| *2b. -do-   | ... 'Astronomy in Medieval India'                                     |
| *3. A. K. Bag ( <i>Delhi</i> )                                | ... 'Knowledge of Calculus in India in the pre-Newtonian Period'      |
| *4. B. Barman   | ... 'The Asiatic Society and the Evolution of Indian Scientific Mind' |
| *5. H. C. Bhardwaj ( <i>Varanasi</i> )                        | ... 'Indian Contribution to the Metallurgy of Zinc in Antiquity'      |
| 6. Sachindra Nath Das ( <i>University of Birmingham, UK</i> ) | ... 'Ancient Indian Vedic Mathematics and Algebraic Computations'     |
| *7. R. C. Gupta ( <i>Ranchi</i> )                             | ... 'Indian Mathematical Science Abroad during Pre-modern Times'      |
| 8. S. C. Jain ( <i>Ajmer</i> )                                | ... 'Biological Education in Indian Schools and Social Values'        |

- \*9. Deepak Kumar (*Delhi*) ... 'Colonial Science and Indian Response, 1820-1880'
- \*10. V. A. Narayan (*Patna*) ... 'Role of Public Association in the Development of Scientific Knowledge in Bengal in Company's Period'
- \*11. A. Rahman (*Delhi*) ... 'Historiography of Science in India'
- 12. Rabindra Nath and S. Saran (*Varanasi*) ... 'Analytical Study of the Glasses of the Classical Age'
- 13. S. R. Rao (*Bangalore*) ... 'History of Harbour Engineering in Ancient India'
- 14. Mira Roy (*Calcutta*) ... 'Agriculture and Meteorology in Ancient India'
- 15. Satpal Sangwan (*Delhi*) ... 'Science Education in India under Colonial Constraints, 1792-1857'
- \*16. S. N. Sen (*Calcutta*) ... 'Technological Education in India, 1884-1914'
- 17. S. D. Sharma (*Patiala*) ... 'Old Indian Methods for Solving Indeterminate Equation of the 2nd Degree'
- 17b. -do- ... 'Halley's Comet in India's Tradition'
- \*18. Madhuri Sheth (*Bombay*) ... 'Women's Contribution to Technological Innovation : Product and Process'
- \*19. Raman Srinivasan (*University of Pennsylvania, USA*) ... 'Science Policy and Organization in India, 1947-57'
- \*20. B. V. Subbarayappa (*Bangalore*) ... 'Technology in India upto 1750 A.D. perspective'
- \*21. S. A. Tirmizi (*Delhi*) ... 'Scientific Associations of the Raj'

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