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PRATIBIMBA SIDDHĀNTA OF JAI SINGH'S LIBRARY

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The paper reports a unique text on perspective drawing translated into Hindi from a European work. The author believes that it is the first European work on any technical subject translated into the *Khaḍī-Bolī* dialect of Hindi. The text also represents Sawai Jai Singh's efforts to make available to his countrymen the technical knowledge of Europe.

INTRODUCTION

Sawai Jai Singh (1688-1743), the astronomer king of Amber and Jaipur, who is widely known for his masonry instruments and observatories, is perhaps the first Indian intellectual who recognized the advances Europe had made in science[1]. He employed European astronomers at his observatories, and with their assistance had a number of European works on astronomy and mathematics translated into Sanskrit. In addition, Jai Singh had a text, entitled *Pratibimba Siddhānta*, on perspective drawing translated into Hindi.

THE MANUSCRIPT

The Sawai Man Singh II Museum, Jaipur, preserves a unique copy of *Pratibimba Siddhānta* in Devanagari[2]. The copy is 27 cm × 20.5 cm in size, bound in hard cover, and is in an excellent state of preservation. It has 54 folios, some of which are numbered. Although the book has no date of any kind, its script suggests it to be of the Jai Singh period.

The text does not have any colophon or title. The title, *Pratibimba Siddhānta*, is given to it by the Museum in its catalogue. The text neither identifies its translator nor reveals the original work on which the translation is based. On the very first page of the *Pratibimba Siddhānta*, there is a note in Rajasthani, which translates: "The book belonging to Pedro jī which (has been) translated (in here)". The note is in a hand other than the one in which the text is written. **The name Pedro suggests that the original book belonged to one of Jai Singh's Portuguese assistants. Pedro could have been Pedro de Silva, the physician-astronomer who came from Portugal in 1730 AD and settled in Jaipur[3]. He could also have been the Pedro who, as a member of the scientific fact-finding mission of the Raja, went to Portugal[4]. Since both of these Pedros were Portuguese, the original text must have been either in Portuguese or in Latin, and the translation must have been done with their assistance or with the assistance of one of the Jesuits employed in the service of the Raja.**

CONTENTS

The text of *Pratibimba Siddhānta* deals with the subject of perspectives or the theory representing solid objects on a flat surface in such a way as to convey the impression of depth and distance. Its subject matter is similar to that in chapters on perspectives in engineering graphics course taught to first year students in the US engineering schools. The author of the text starts out by defining the technical terms, such as the horizon *(Kṣitija rekhā)* and the ground line *(jamīna rekhā)*. Next, he discusses one-point perspectives, two point-perspectives, and arcs-in-perspective with appropriate diagrams. The author also displays shading techniques to indicate depth. Finally, he shows how to draw perspectives of complicated figures such as a table or a chair.

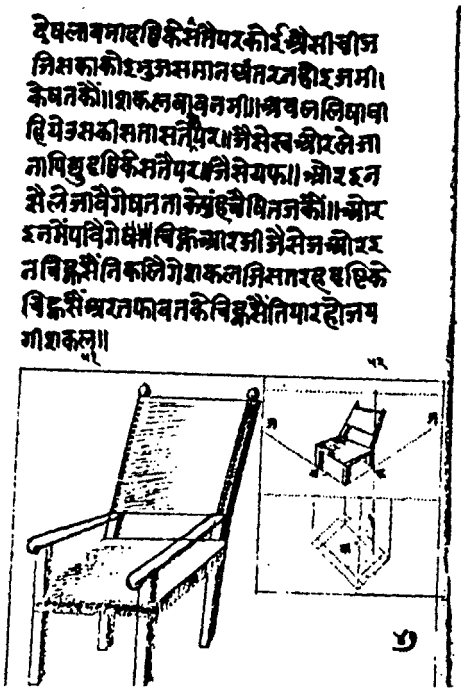
On its second folio, the *Pratibimba Siddhānta* has a list of *abjad* numbers and their Arabic equivalents. The text begins on the third folio and is profusely illustrated with carefully drawn figures. The first figure appears on folio numbered one, but this figure is not numbered[5]. The next figure is numbered as the sixth, and the following figures are numbered as the seventh, eighth and so on, up to the last figure – numbered as the 56th. The figure numbers, it seems, follow the original text. Because the translator has left out the first four figures, the total number of the figures is 52.

LANGUAGE

Jai Singh had the text of *Pratibimba Siddhānta* translated for builders, engineers, artists and draftsmen. Since this group of professionals did not necessarily know Sanskrit, Jai Singh had the translation done in Hindi. For the translation the translator chose the *Khaḍī-Bolī* dialect of Hindi, spoken in the cultured circles of Delhi and Agra at the time. At that time the prose of this dialect had not yet fully developed; thus the translator had difficulty in finding proper technical terms for his work. The author believes that *Pratibimba Siddhānta* is the very first book on any technical subject translated from a European work in the *Khaḍī-Bolī* dialect of Hindi.

THE TRANSLATOR

From the text, a number of things may be deduced about the translator. He knows Sanskrit. In the first sentence of the text he uses a Sanskrit verb-form. He must have been in close contact with Persian scholars, as he frequently borrows Persian terms for which Hindi equivalents were not available to him. His Hindi prose is close to the Hindustani or Urdu spoken by the Muslim intellectuals in the Delhi-Agra metropolis. The translator most probably resided at Delhi where one of Jai Singh's observatories was operating. It is safe to deduce that he was one of Sawai Jai Singh's Brahmin employees working in close cooperation with Jai Singh's Muslim and European astronomers at the Delhi observatory.



Two pages from the *Pratibimba Siddhānta*.

Acknowledgments

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Notes and References

1. For a brief account of Jai Singh's astronomical program, see Sharma, Virendra Nath, Astronomical Efforts of Sawai Jai Singh – A Review, in *History of Oriental Astronomy*, IAU Colloquium 91, edited by G. Swarup, A.K. Bag and K.S. Shukla, Cambridge University Press, Cambridge, 1987.
2. *Pratibimba Siddhānta*, The Sawai Man Singh II Museum, Jaipur, No. 2016. Also Bahura, Gopal N., *Literary Heritage of the Rulers of Amber and Jaipur*, 1976, 172, Jaipur.
3. The descendents of Pedro de Silva still reside at Jaipur. According to a genealogy given to the author by one of these descendents, there was only one Pedro among their ancestors – the one who came originally from Portugal in 1730 AD. The genealogy had been obtained from the Rajasthan State Archives, Bikaner for a court case.
4. For Sawai Jai Singh's delegation to Europe see Sharma, Virendra Nath, Jai Singh, His European Astronomers and the Copernican Revolution, *Indian J. Hist. Sci.*, 1982, **17**(2), 345-352. Also Moraes, George M., Astronomical Missions to the Court of Jaipur, *J. Bombay Roy. Asiatic Soc.*, 1951, **27**, 61.
5. The first three folios of the text are not numbered.
6. NSF Grant No.INT-8016996