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Lilawati; or a Treatise on Arithmetic and Geometry

An important mathematician and astronomer in medieval India, Bhascara Acharya (1114–85) wrote treatises on arithmetic, algebra, geometry and astronomy. He is also believed to have been head of the astronomical observatory at Ujjain, which was the leading centre of mathematical sciences in India. Forming part of his Sanskrit magnum opus *Siddhānta Shiromani*, the present work is his treatise on arithmetic, including coverage of geometry. It was first published in English in 1816 after being translated by the East India Company surgeon John Taylor (*d.*1821). Used as a textbook in India for centuries, it provides the basic mathematics needed for astronomy. Topics covered include arithmetical terms, plane geometry, solid geometry and indeterminate equations. Of enduring interest in the history of mathematics, this work also contains Bhascara's pictorial proof of Pythagoras' theorem.

Lilawati

or a Treatise on Arithmetic and Geometry

Bhascara Acharya
Translated by John Taylor

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LILAWATI:

OR

A TREATISE

ON

Arithmetic and Geometry

BY

BHASCARA ACHARYA.

TRANSLATED FROM THE ORIGINAL SANSCRIT

BY

JOHN TAYLOR, M. D.

OF THE HON'BLE EAST INDIA COMPANY'S BOMBAY MEDICAL ESTABLISHMENT.

BOMBAY:

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1816.

TO

THE RIGHT HONORABLE FRANCIS,

EARL OF MOIRA, BARON RAWDON IN IRELAND,

&c. &c. &c. K. G.

GOVERNOR GENERAL OF INDIA,

&c. &c. &c.

THE FOLLOWING WORK,

Illustrative of the Mathematical Science of the Hindus,

IS MOST RESPECTFULLY DEDICATED

BY

HIS OBEDIENT AND HUMBLE SERVANT,

JOHN TAYLOR.

Extract from the Minutes of the Proceedings of the Literary Society of Bombay, 27th June 1815.

MR. ERSKINE read to the Society a Translation by DR. TAYLOR from the Original Sanscrit, of the Lilawati, a Treatise on Hindu Arithmetic and Geometry.

The above being a Work which has been frequently called for by the learned in Europe, and it being desirable for the sake of accuracy, that it should be printed under the eye of the Translator, IT IS RESOLVED that the printing of the Work shall be immediately undertaken at the expense of the Society under DR. TAYLOR s superintendance; and that their thanks be returned to him for his valuable labors.

ERRATA.

Introduction page 5, line 7, *for* Mecleod *read* Macleod.

——————— page 17, line 2 *for* 6 × 13, *read* 9 × 10.

Page 7 Line 33 *for* 317 23 *read* 17 28.

10 Line 6 *for* 12 *read* 20.

13 Line 3 *for* by double the sum of this last figure, *read* by double this last figure.

do. note c *for* 7890 *read* 7690 and *for* 861 *read* 661.

Page 16 line 27 *dele* the words " adding the unit if there be one to the preceding quotient figure."

Page 27 *dele* the first line.

The following remark, which with many other explanatory remarks, was furnished me by Lieutenants Macleod and Tate, on the rule for summation of tranposed numbers page 135, was omitted to be inserted in its proper place.

The truth of this rule is evident, for if the whole of the transposed numbers be set down, and added together, the sum of all the vestical columns of units, tens, &c. will be equal to each other, and will each amount to the sum of the given digits, multiplied by the number of transpositions, and divided by the number of these digits; consequently, each column being thus separately summed up, and set down one place forward, the amount of these sums will give the sum of the whole of the transposed numbers.

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