Modern Civilisation and Living Ancient Mathematics by T. Nag, published by the author, 4115 SW Washington Avenue, Portland, Oregon, 93701, 1991, pp. 76, $ 9.95.

The author here is concerned with only those major concepts of mathematics which are living and have 'survived'. According to his criterion, that mathematician is the greatest whose concepts are still living unchanged and who has influenced modern civilisation in an indispensable manner. According to this criterion, the author considers Brahma Gupta as the greatest mathematician of all times, even surpassing the three considered greatest by all others, namely, Archimedes, Newton and Gauss. Thus, he says:

"Brahma Gupta more than any other single mathematician of the world helped to accelerate the growth of our economy, commerce, mathematics, technology and most of the aspects of our civilisation. Brahma Gupta is the most indispensable mathematician in the world without whose work the progress of civilisation would have been severely affected. Brahma Gupta contributed more to human progress than any other mathematician. Brahma Gupta was the only mathematician whose greatest three works have not been changed even to the slightest extent or partially replaced by any other concepts over the last 1300 years. Brahma Gupta was the only mathematician who created three inventions: the zero, numerals and the negative numbers, among the greatest in mathematics, single-handedly without sharing the inventions with any other mathematicians. For all these inventions, Brahma Gupta should be considered as the greatest mathematician who ever lived on our planet".

The author seeks to show that computable zero and operations with negative numbers and zero were not used as such in any civilisation, Sumarian, Egyptian, Greek, Mayan, Japanese, Chinese, Arab and even in Indian civilisation in the books of Arya Bhaṭa and others before Brahma Gupta.

He claims that Brahma Gupta was the first to explicitly include these inventions in his work.

The author pays rich tributes to Greek, Japanese, Chinese and Indian mathematicians and tries to trace the lines of communication among the mathematicians of these countries.

In an addendum to the book, the author argues that since the oldest surviving edition of the Chinese classic "9 chapters of the mathematical arts" is dated 1213 AD and there is no other manuscript before that in Chinese, Japanese or Korean which mentions computable zero and since Gautam Sidhartha, an Indian astronomer familiar with the work of Brahma Gupta, had visited China in about 718 AD, the occurrence of computable zero and operations with negative numbers in this Chinese work was due to the influence of Brahma Gupta.

The author believes that a picture is worth a thousand words and he has given accordingly 10 figures to illustrate his ideas.

One may or may not agree fully with the thesis of the author, but it has to be conceded that the author has tried to make a strong case for his ideas and has presented his case in a lucid manner. The book deserves to be read, discussed and debated.

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Gunakar Muley, संसार के महान गणितज्ञ (Eminent Mathematicians of the World) (in Hindi), Rajkamal Prakashan, Delhi-110 092, pp. 423, Rs. 250.

Both the author and the publisher have to be congratulated for bringing out this excellent account of the lives and works of 39 eminent mathematicians of the world of the last 2300 years. These include Euclid, Archimedes, Arya Bhatta, Bhaskara Acharya, Pascal, Liebnitz, Newton, Euler, Lagendre, Laplace, Gauss, Lobachevsky, Bolyai, Cauchy, Abel Jacobi, Galois, Bole, Hamilton, Cayloy, Sylvester, Wierstrass Riemann, Poincare, Cantor, Hilbert, Ramanujan, Hyptia, Agnes, Sophie Germain, Kowalewskya and Noether.

It is also noticed that out of all these mathematicians two are Greek, five of them are Indians, one is Arab and the rest of them, including 7 women, are all Europeans. The book does not include the biography of any Chinese, German or American mathematician. It also does not include biographies of mathematicians who have mostly lived and worked in the 20th century.

Mathematics is a dynamic intellectual enterprise. Its knowledge grows exponentially and doubles in a period of about 10 years. 99% of the mathematics that exists today has been created in the 20th century and more than 90% of the mathematicians of all times are alive today. Their biographies could not possibly be included because all these mathematicians are too near our times and even their biographies are not easily available in English, though many of the biographies of those who have won Field medals are easily available. The reviewer has also edited the biographies of 36 eminent Indian mathematicians of the 20th century in 4 volumes, which have been published by MSTS and one more volume is under preparation. It is hoped that the author and publisher will also enrich the literature in Hindi with the biographies of some of the 20th century mathematicians in course of time.

Twenty eight of these biographies had earlier appeared in a series of articles in *Vigyan Pragati* and these were highly appreciated by the readers.

These biographies will help in exploding the myth from the public mind that mathematicians are absent-minded or eccentric or always lost in thought. They have the same weaknesses and strengths as other great artists and scientists.

Though there are some excellent biographies of mathematicians in English and these have been available for more than 40 years, this is the first book in Hindi. This is especially welcome, because it will help in popularising mathematics among a large number of Hindi knowing people who do not know English or whose knowledge of English is not sufficiently strong (and these include a large number of mathematics graduates themselves). Moreover, the English books of Bell and Harper and others are quite costly and are not easily available in many school and college libraries.

One excellent book in English on the biographies of the mathematicians of the 19th century is by our own great mathematician, the late Dr. Ganesh Prashad. It appears that the author of the present book has not seen that book, since it has been out of print for some time. However, that book contains a great deal of original material which is not available in other books in English.

There are some useful appendixes. Appendix 1 gives chronological development of mathematics from 4000 BC to 1989. Appendix 2 gives bibliography of 20 books in Sanskrit, 2 books in Marathi, 23 books in Hindi and about 100 books in English. Appendix 3 gives Hindi to English translation of important words. Appendix 4 is index of names and Appendix 5 is subject index.

There is also another book in Hindi on history of mathematics verse written by Prof. R.S. L. Shrivastava and published by MSTS, which is again a unique book of its own kind.

The reviewer hopes that all the school and college libraries will get this book. He also hopes that the publisher will bring out a cheaper paperback edition, so that all educated people of today knowing Hindi can know about the lives of those people who have given us our great heritage of mathematics.

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A Modern Introduction to Ancient Indian Mathematics by T.S. Bhanu Murthy, Wiley Eastern, New Delhi, 1992, pp. 214, Rs. 70 (paperback)

The author himself clarifies in the preface that "The present book is not devoted to recounting the historical development of mathematics in our country. For such a study, the reader is referred to classic treatise of B.B. Dutta and A.N. Singh and the monographs of C.N. Srinivas Iengar and T.A. Saraswati Amma. The purpose of my book is two-fold:

(i) To provide simple proofs of the propositions stated by Sri Bharti Krishna Tirtha in his book *'Vedic Mathematics'*;

(ii) To provide a modern introduction to some of the theorems of Arya Bhatta, Brahma Gupta, Bhaskara and Madhava."

He does not, however, provide proofs of the 16 *sutras* of the book "*Vedic Mathematics*". He gives proofs of only some results concerning divisibility and finding recurring decimal expression for 1/n for some values of n. He, however, explains that while Swamiji's methods are simpler in some cases, they may be more complicated in other cases. Only about one half of the second chapter is devoted to proving these results; the other half is devoted to proving the results of Arya Bhatta, Bhaskara, Sridhara and even of some foreign mathematicians.

The first chapter on integers gives the necessary background of number theory needed for understanding the later chapters. The third chapter is mainly concerned with the solutions of second degree Diophantine equation $Dx^2 + k = y^2$ given by Brahma Gupta, Narayana and others. The necessary background of continued fractions is also given. There is also a historical account of the development of evaluation of π.

The last chapter gives some selected topics in geometry. It includes geometry in *Sulva Sutras* and results on the geometry of the triangle, cyclic quadrilateral and the circle. The book is not a systematic account of either Ancient Indian Mathematics or of the so-called Vedic Mathematics. It discusses some topics selected by the author according to his own taste. However, whatever topics he has discussed, he has discussed logically and rigorously.

The reviewer welcomes the book as a useful contribution, because he has always been pleading that we should examine all mathematics contributions of Ancient India from modern mathematics point of view. He hopes that other authors will undertake the task of writing more comprehensive books on the subject on the lines of the present book.

There is need for a comprehensive book giving proofs of all the *sutras* wherein all the results in '*Vedic Mathematics*' will be written. Here also, the first major step of giving most of the proofs was undertaken by late Prof. P.L. Bhatnagar in an article in the *Mathematics Teacher* (India), but a comprehensive account is yet to be written.

It is hoped that the present book will be read by all students and teachers and others interested in the great contributions to mathematics that our ancient scholars made.

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