# Adventures in numberland

**FIGURING: THE JOY OF NUMBERS: By Shakuntala Devi, Published by: Clarion Books, G.T. Road, Shahdara, Delhi-110 032. Rs. 35.00.**

Be it Menuhin in music or Gauss in mathematics, a child prodigy is universally admired, especially when the promising talent is continued beyond the early years. Shakuntala Devi belongs to such a class of Indian prodigies. Falling in love with numbers, in her own words, at the age of three, she even found an emotional security in numbers. In the introduction to this book which seeks to share with the readers the joy of her adventures in Numberland, she records: 'Two plus two always made, and would always make, four—no matter how the world changed'. While a professional mathematician may lift an eyebrow at such a statement it nevertheless accurately reflects her confidence in intuitively dealing with tricky computations beating even the electronic calculators in the game.

The blurb of the book itself brings out the point picturesquely. The author is sitting in front of a black-board showing a 201-digit number with the instruction to evaluate its 23rd root. Devi took fifty seconds to find the answer mentally while a Uinvac 1108 Computer needed a full minute and 13,000 instructions just to verify the correctness of her answer.

This magnificent feat is certainly beyond the mortals who shudder at even simple arithmetical calculations demanded in everyday life. It is to such laymen that Shakuntala addresses himself—'to show those who think mathematics boring and dull just how beautiful it can be'. The enchanting picture of numbers is slowly unfolded to the view of the reader, exposing exciting and intricate number patterns to him. The 'secret steps' taking him to their fascinating world are indicated.

Shakuntala Devi certainly succeeds in communicating her infectious enthusiasm about the charm of numbers to even those least susceptible to it, with a lively, simple and effective presentation of easy techniques which do not presuppose any knowledge of arithmetic at all. She starts with the definition of even such simple terms as the digit, the square and cube of a number, roots etc. and devotes twelve chapters to deal with the well known processes of addition, subtraction, multiplication and division, finding the square root and the cube root of a given number, computing with percentages, discounts, interests decimals and fractions, and finding the GCM and LCM of given numbers. The material is hardly new and is really secondary school stuff. What makes it pleasingly different is the presentation. It indicates a majestic boulevard or a mystifying alley in the numberland luring even the reluctant onlooker for a visit.

The last three chapters deal with the calender, some special numbers and tricks and puzzles and they are rewarding to read. Here is a sample. Multiply the number 142857 successively by 1, 2, 3, 4, 5, 6 and 7. Find for yourself the exquisite patterns formed.

Yet it is an imperfect world where even a good book from a prodigy contains an occasionaly obscure or even incorrect statement. Somewhere the author remarks: Here is an oddity of number 2. 123456789 + 123456789 + 987654321 + 987654321 + 2 = 2222222222. What is odd about it? The recurrence of the digit 2? But note that 123456789 + 987654321 + 1 = 1111111111. So if one adds this twice the digit 2 is repeated and when added thrice, surely 3 will be repeated and so on! The mention of 'oddity' of the number 2 is itself odd!

A more serious error is committed by the author when she mentions the famous Ramanujan numbers. She makes Professor Hardy, visiting the Indian mathematician at the hospital, say that the taxi which brought him had a boring (!?) number 1729. She also makes Ramanujan say that this was the only number which could be expressed as the sum of two cubes in two different ways. $1729 = 10^3 + 9^3 = 12^3 + 1^3$. Ramanujan never said so! He knew and said that it is the smallest number with this special property. As a matter of fact one may give a sequence of Ramanujan Numbers: 1729; 4104; 13832; 40033 etc., etc.

The 156 pages of the book mostly contain useful, beautiful and interesting information regarding the eternally charming world of numbers and yet, even with an excellent get-up and fine printing, the book appears to be prodigiously priced at thirty five rupees, perhaps a worthy price to pay for sharing the joy of a prodigy!

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