“Feynman’s Lost Lecture: The Motion of the Planets Around the Sun”, by David L. Goodstein and Judith R. Goodstein, Vintage Books, (1997), Price 6.99 Pounds.

On March 14, 1964, the freshmen class at Caltech was given a guest lecture on ‘The Motion of Planets around the Sun”. Notwithstanding the pedestrian title, the lecture itself was a *tour de force* of pedagogy. And it was delivered by the awe- inspiring star of the Caltech Physics faculty, Richard Feynman. For some odd reasons, the lecture remained buried in the papers of Feynman till it was rescued by David Goodstein, a colleague at Caltech. The book under review is the transcript of this ‘Lost Lecture” alongwith a detailed commentary by the authors, David and Judith Goodstein.

The story really goes back to 1543 when the Polish cleric, Nicholas Copernicus published a book which would bring about a radical change in the way human beings understood the universe. The book, “On the revolutions of Celestial Spheres” argued that Sun, and not the Earth was at the center of the universe and the earth and other planets revolved around the Sun. Before Copernicus, our view of the world was essentially derived from the teachings of Aristotle who had argued for a stationary Earth around which the stars revolve in celestial spheres. This point of view, which underwent minor modifications (primarily by Ptolemy, who added epicycles to account for the irregular motion of planets) held for almost two thousand years since the 5 century B.C.

Apart from Copernicus, the three other men who played a crucial role in overthrowing the Greek view were Tycho Brahe, Johannes Kepler and Galileo Galilei. Brahe made extensive measurements of the motion of the planets which were then analyzed by Kepler to produce his now celebrated Laws of Planetary Motion. After Kepler came Galileo, who by introducing the telescope revolutionized the science of astronomy. He was also responsible for introducing the experimental method which in a sense was responsible for the growth of Science as we know it now.

Galileo died in 1642 after being persecuted by the church for his heretical views. In 1687, Isaac Newton published “Philosophiae Naturalis Principia Mathematica” (Mathematical Principles of Natural Philosophy), 1687, arguably the most important single work in the history of modern science. In it, Newton derived Kepler’s Laws for planetary motion by making use of geometry only. It was this derivation which was the subject of Feynman’s lecture in 1964.

Richard Phillips Feynman was widely regarded as the most brilliant, influential, and iconoclastic figure in the field of particle physics his field in the post-World War II era. He was born in 1918 and had his education at M.I.T. and Princeton. He worked in the Manhattan Project for developing the first Atomic Bomb and subsequently settled at Caltech where he remained till his death in 1988. He made several pathbreaking contributions to the field of particle physics including his celebrated work on quantum electrodynamics (the theory of the interaction of light with matter) for which he was awarded the Nobel Prize in 1965.

As Hans Bethe, a celebrated physicist and Feynman’s senior says,” there are ordinary geniuses and magicians…………. .Feynman was a magician”. Nevertheless, his uncanny intuition about physical phenomenon and his tremendous intellectual powers did not detract from his humanness. He was a passionate bongo player, used to crack open locks for fun and also deciphered Mayan hieroglyphics! His numerous adventures, which were part of the scientific folklore have been collected in the charming book, “ Surely You’re Joking , Mr. Feynman”.

But there was another aspect of Feynman which was noteworthy. He was an exceptional teacher. His “Feynman Lectures in Physics” has taught and inspired a whole generation of scientists. His unmatched ability to reduce a complicated phenomenon to its bare essentials and most importantly, to communicate the essential ideas lucidly have made these books classics.

In the lecture given by Feynman in 1964 which is reproduced in this book, he had wanted to reproduce the arguments used by Newton in his “Principia “so that they could be understood by anyone with a knowledge of school level geometry. Not being able to understand Newton's proof completely, in typical Feynman style, he set about giving his own geometrical proof of the Laws of Planetary Motion. The book contains, apart form the original lecture by Feynman, a detailed commentary and an introduction by the authors. The only tool used is geometry and hence the book is accessible to any high school student. There is a short introduction to the history of the heliocentric theory as well as a touching reminiscence of Feynman. The text is supplemented by numerous, well rendered diagrams which make the line of reasoning clear.

In his introduction to the "Feynman Lectures in Physics" , Feynman has a very insightful quote from Gibbons; " the power of instruction is seldom of much efficacy except in those happy dispositions where it is almost superfluous". Feynman may have been dejected by his failing to evoke an enthusiasm for the mysteries of nature among students, but this lecture will certainly inspire anyone who reads it. This book should not only be read by anyone interested in science but also is a must for anyone interested in seeing how a great mind works.