

Bookshelf

To Explain the World: The Discovery of Modern Science

By Steven Weinberg

Harper Collins/Allen Lane

Hardback: £20 \$28.99

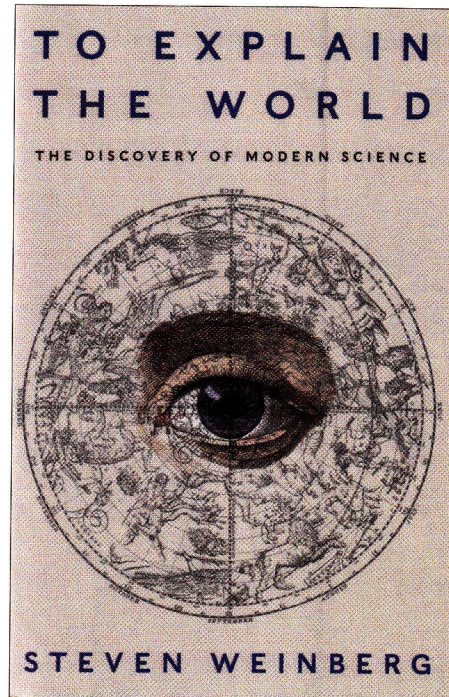
Also available at the CERN bookshop

Steven Weinberg's most recent effort is neither a treatise on the history of science nor a philosophical essay. The author presents instead his own panoramic view of the meandering roads leading to the Newtonian synthesis between terrestrial and celestial physics, rightfully considered as the beginning of a qualitatively new era in the development of basic science.

The first and second parts of the book deal, respectively, with Greek physics and astronomy. The remaining two parts are dedicated to the Middle Ages and to the scientific revolution of Copernicus, Galileo and Newton. The aim is to distil those elements that are germane to the development of modern science. The style is more persuasive than assertive: excerpts of philosophers, poets and historians are abundantly quoted and reproduced, with the aim of corroborating the specific viewpoints conveyed in the text. A similar strategy is employed when dealing with the scientific concepts involved in the discussion. More than a third of the 416 pages of the book contain a series of 35 "technical notes" – a quick reminder of a variety of geometric, physical and astronomical themes (the Thales theorem, the careful explanation of epicycles for inner and outer planets, the theory of rainbows and various other topics relevant to the main discussion of the text).

Passing before you through the pages, you will see not only Plato and Aristotle, but also Omar Khayyam, Albertus Magnus, Robert Grosseteste and many other progenitors of modern scientists. Nearly 2000 years separate the natural philosophy of the "Timaeus" from the birth of the scientific method. Many elements contributed serendipitously to the evolution leading from Plato to Galileo and Newton: the development of algebra and geometry, the divorce between science and religion, and an improved attitude of abstract thinkers towards technology. All of these aspects have certainly been important for the tortuous emergence of modern science. But are they sufficient to explain it? Scientists, historians and laymen will be able to draw their own lessons from the past as presented here, and this is just one of the intriguing aspects of this interdisciplinary book.

After reading this book quietly, you might



be led to conclude that good scientific ideas and daring conjectures take a long time to mature. It has been an essential feature of scientific progress to understand which problems are ripe to study and which are not. No one could have made progress in understanding the nature of the electron, before the advent of quantum mechanics. The plans for tomorrow require not only boldness and fantasy, but also a certain realism that can be trained by looking at the lessons of the past. Today's most interesting questions may not be scientifically answerable tomorrow, and lasting progress does not come by looking along a single line of sight, but all around, where there are mature phenomena to be scrutinized. This seems to be true for science as a whole, and in particular for physics.

● Massimo Giovannini, CERN and INFN Milan-Bicocca.

The Oskar Klein Memorial Lectures 1988–1999

By Gösta Ekspong (ed.)

World Scientific

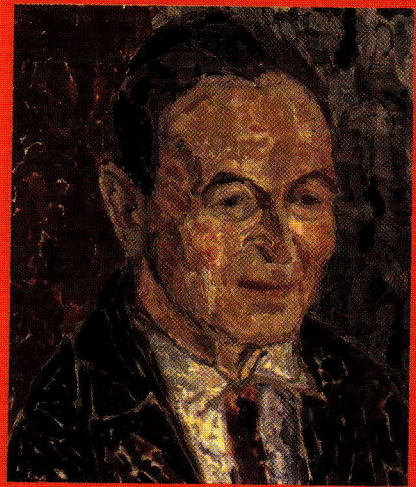
Hardback: £45

E-book: £34

Perhaps every reader of *CERN Courier* has heard about the Klein–Gordon equation, the Klein–Nishina (Compton effect) cross-section, the Klein paradox and the Kaluza–Klein compactified five-dimensional unified theory of gravity,

THE OSKAR KLEIN MEMORIAL LECTURES

1988–1999



Editor: Gösta Ekspong

electricity and magnetism. However, few will know about the scientist, Oskar Klein (1894–1977), the pre-eminent and visionary Swedish theoretical physicist from Stockholm whose work continues to influence us to this day.

This book is needed. The reason is described eloquently in the contribution by Alan Guth, whose words I paraphrase: how many recognize Oskar as the first name of "this" Klein? Compare here (by birth year, within 10 years): Niels B (1885), Hermann W (1885), Erwin S (1887), Satyendra N B (1894), Wolfgang P (1900), Enrico F (1901), Werner H (1901), Paul A M D (1902), Eugene W (1902), Robert O (1904). Thanks to this book, Oskar K (1894) will take his place on this short list.

Part of the book collects together all of the Oskar Klein Memorial Lectures given since the series began at Stockholm University in 1988, through to 1999, by many well-known theoreticians, from Chen Ning Yang to Gerard 't Hooft. Some of these lectures relate to Klein because he often happened to "be there" at the beginning of a new field in physics. For example, in early 1948, Klein recognized immediately, following the disambiguation of the pion and muon, that muon decay and common beta decay can be described by the same four-fermion interaction (see the contribution by T D Lee).

The other part of the book – a third of the 450 pages – is a biographical collection