

**NATURE
SERIES. LIGHT**

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Nature Series. Light by Alfred M. Mayer & Charles Barnard

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ALFRED M. MAYER & CHARLES BARNARD

**NATURE
SERIES. LIGHT**

NATURE SERIES.

LIGHT:

A SERIES OF

SIMPLE, ENTERTAINING, AND INEXPENSIVE
EXPERIMENTS IN THE PHENOMENA OF LIGHT,
FOR THE USE OF STUDENTS
OF EVERY AGE.

BY

ALFRED M. MAYER

AND

CHARLES BARNARD.

WITH ILLUSTRATIONS.



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R. CLAY, SONS, AND TAYLOR,
BREAD STREET HILL.

PREFATORY NOTE.

IT is the design of this book to furnish a number of simple and easy experiments in the phenomena of light, that any one can perform with materials that may be found in any dwelling-house, or that may be bought for a small sum in any town or city. By the aid of this book the reader becomes an experimenter. The student of Nature may read in books, and soon forget. The experimenter who questions Nature himself, who constructs his own apparatus, and who performs his own experiments, learns past forgetting. He knows because he has observed.

It is believed that this book will occupy a place hitherto unfilled in scientific literature. It is specially prepared for the boy or girl student, and for the teacher who has no apparatus, and who wishes his pupils to become experimenters, strict reasoners, and exact observers. Nearly all the experiments described are new, and all have been thoroughly tested. The materials employed are of the cheapest and most common description, and all the experiments may be performed at an expense of less than £3. The apparatus is, at the same time, suitable for regular daily use in both the home and school, and with care should last for years.

The origin of this series of books, and the manner of their production, may be briefly stated. For several years Professor Mayer has been studying how to give to every teacher and scholar the knowledge of the art of experimenting. To accomplish this very desirable object, he had invented the simplest and cheapest apparatus, and he and his scientific friends had been satisfied with their performance. It remained to describe these instruments and the ways of using them. He found, however, that his leisure from professional duties was not sufficient for this work; and, not to delay further the publication of his labours, Professor Mayer called in Mr. Charles Barnard to assist him in preparing the books for the press. The construction and arrangement of the instruments were explained to Mr. Barnard, and the experiments were made before him. Mr. Barnard then wrote out the descriptions, which were revised by Professor Mayer. The engravings have been made under Professor Mayer's special direction, and care has been taken to render them accurate representations of the apparatus and experiments.

The nature of light is not touched upon in this volume. The authors propose to explain, in another book, the phenomena of interference and polarisation of light, and to explain fully the structure of the eye and the nature of vision.

THE AUTHORS.

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LIGHT.

CHAPTER I.

INTRODUCTION.

ALL about us are men busy with their various trades and professions: sailing ships, digging in mines, making all manner of useful tools and machinery, planting seeds and reaping harvests, and doing many other works and labours according to certain fixed rules that they found printed in books, or that they learned of others, or that they discovered for themselves. Each one has to do with the physical phenomena around him. The more he knows about these phenomena—the more he knows about things, their relation to each other, and their action one upon another—the better he can work. A knowledge of the phenomena of Nature is the most important knowledge one can have who wishes to succeed in life. More than this, the observation of facts in Nature gives readiness of perception, and study and reading upon the causes of these facts stimulate the mind to healthful and pleasurable action.

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