

**A FAMILIAR INTRODUCTION TO THE
STUDY OF POLARIZED LIGHT: WITH A
DESCRIPTION OF,
AND INSTRUCTIONS FOR USING THE
TABLE AND HYDRO-OXYGEN
POLARISCOPE AND MICROSCOPE**

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A familiar introduction to the study of polarized light: With a Description Of, and Instructions for Using the Table and Hydro-oxygen Polaroscope and Microscope by Charles Woodward

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CHARLES WOODWARD

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BY
CHARLES WOODWARD, F.R.S.,
President of the Salington Literary and Scientific Society.
ILLUSTRATED BY NUMEROUS WOOD ENGRAVINGS.

THIRD EDITION,
CAREFULLY REVISED.

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P R E F A C E

T O T H E F I R S T E D I T I O N .

Messrs. SMITH & SON having requested me "to oblige them with a description of, and instructions for using, my Table and Hydro-oxygen Polariscopes and Microscope," and several friends possessing achromatic microscopes fitted with the polarizing apparatus having lamented the difficulty of comprehending the laws of the phenomena thereby exhibited, I have endeavoured to render the use of these instruments more interesting, by presenting, in a concise and familiar manner, such introductory information as may smooth the threshold of a subject confessedly abstruse, and lead to the study of works of far higher pretensions and deeper research.

I have briefly noticed those facts which have gradually led to the very general adoption of a theory concerning the nature of light differing in some important respects from that advanced by Sir Isaac Newton ; and I have endeavoured to shew that his successors, whilst they have adopted another theory, have yet done little more than given new names to old facts, leaving his discoveries and his calculations still to form the firm basis of the science.

During my earlier studies I read many works connected with the subject of light, and have, no doubt, almost imperceptibly adopted the ideas of others, when they were subsequently confirmed by my

own observations or experiments. As, however, the following pages have been written without referring to any but a few notes forming the outlines of lectures on the polarization of light, which, as an amateur, I have occasionally delivered in a popular style, I am now only able to acknowledge my obligations *generally* to those who may have assisted my investigations, and to evince my gratitude by attempting to facilitate the inquiries of others.

C. W.

COMPTON TERRACE, ISLINGTON,
APRIL, 1868.

PREFACE

TO THE SECOND EDITION.

HAVING undertaken to prepare for Messrs. SMITH & BECK another edition of my "Familiar Introduction to the Study of Polarized Light," I readily embrace the opportunity thus afforded me of tendering my thanks to the many scientific friends who have expressed their approbation of the attempt "to facilitate the inquiries" of those who desire to study this highly interesting but "confessedly abstruse" branch of science.

Some few, indeed, have intimated that I should have prosecuted the subject still further; but this could scarcely have been accomplished without defeating the professed object of "presenting, in a concise and familiar manner, such introductory information" as might prepare the inquirer for "deeper research."

I have, however, carefully revised the whole; and by altering Figures 9 and 10, and adding two others illustrative of the polarization of light by reflection, I trust it will be found that I have more clearly explained that part of the subject.

C. W.

COMPTON TERRACE, ISLINGTON,
JUNE, 1851.



PREFACE

TO THE THIRD EDITION.

FINDING by the continued demand for my "Familiar Introduction to the Study of Polarized Light," that a third edition may be required, I have again carefully revised the whole; and knowing that this difficult subject cannot be comprehended without thoroughly understanding the principle of "Interferences," I have introduced an additional figure to illustrate Dr. Young's fundamental experiment on the *interference of the waves of ether*.

I have also added a small diagram, which I trust will enable the students of microscopic science to comprehend more readily Newton's experiments on "thin plates of air," and the effects of his "odd and even numbers," which, when elucidated by the wave theory, may be considered the key to the explanation of the beautiful phenomena produced by the polarization of light.

C. W.

COMPTON TERRACE, ISLINGTON,
APRIL, 1861.