AN ELEMENTARY TREATISE ON GEOMETRICAL OPTICS

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An Elementary Treatise on Geometrical Optics by R. S. Heath

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AN ELEMENTARY TREATISE

ON

GEOMETRICAL OPTICS

BY

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PREFACE.

THE present work is essentially an abridgment of my larger treatise on Geometrical Optics, and is primarily intended for the use of students who require an exposition of the principles of Optics and their application in the use and construction of optical instruments, without very extended and complicated mathematical analysis. It is elementary, inasmuch as it uses no mathematics beyond trigonometry.

In the task of selection and arrangement, I have departed somewhat from the traditions of previous writers of elementary text-books on Optics. My object has been to include only those parts of the theory which could be investigated completely and satisfactorily by elementary methods, and to treat those parts as fully as possible. Thus, while giving an account of the method of correcting optical instruments for their most important defect, that due to chromatic dispersion, I have omitted entirely the theories of aberration and of thin pencils, believing that they are not suited to elementary treatment and that they should be postponed until they can be investigated by more advanced and comprehensive methods. On the other hand the theory of lenses, as developed by Gauss, has

been worked out completely, and the description and theory of the ordinary optical instruments are given in much greater detail than has been usual in elementary treatises. The theory of vision through lenses is based upon Cotes' theorem, after the manner of the older English writers on Optics, Cotes and Smith. An elegant geometrical construction for the deviation of a ray at a refraction, due to Prof. P. G. Tait, furnishes an elementary theory of the rainbow. Numerous easy exercises are scattered through the text, and several typical examples are fully worked out, while the more difficult are collected at the end of the chapters. The articles marked with an asterisk may be omitted at a first reading.

Suggestions which may improve and extend the usefulness of the book and notifications of errors will be very thankfully received by the author.

R. S. HEATH.

MASON COLLEGE, BIRMINGHAM,
August, 1888.

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