ASSOCIATION FOR THE IMPROVEMENT OF GEOMETRICAL TEACHING. THE ELEMENTS OF PLANE GEOMETRY: PART II (CORRESPONDING TO EUCLID, BOOKS III., IV., V., VI.)

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THE ELEMENTS

OF

PLANE GEOMETRY.

THE COUNCIL of the Association for the Improvement of Geometrical Teaching desire to call the attention of all who are interested in the teaching of Geometry to the reports of the Mathematical Board at Cambridge and the Board of the Faculty of Natural Science at Oxford upon a Memorial recently presented to these Universities through the Council.

The Cambridge Board reports (*Cambridge University Reporter*, May 31st, 1887):

> "The majority of the Board are of opinion that the rigid adherence to Euclid's text is prejudicial to the interests of education, and that greater freedom in the method of teaching Geometry is desirable. As it appears that this greater freedom cannot be attained while a knowledge of Euclid's text is insisted upon in the examinations of the University, they consider that such alterations should be made in the regulations of the examinations as to admit other proofs besides those of Euclid, while following, however, his general sequence of propositions, so that no proof of any proposition occurring in Euclid should be accepted in which a subsequent proposition in Euclid's order is assumed."

Signed by

C. SMITH, *Chairman.*

(PROF.) G. G. STOKES,	(DR.) P. FROST,
(PROF.) J. C. ADAMS,	J. W. L. GLAISHER,
(PROF.) J. STUART,	C. GRAHAM,
(PROF.) G. H. DARWIN,	E. W. HOBSON,
(PROF.) J. J. THOMSON,	J. LARMOR,
(DR.) E. J. ROUTH,	A. R. FORSYTH,
(DR.) W. H. BESANT,	S. L. LONEY.

The above list contains the names of all members of the Board with two exceptions.

The Oxford Board in nearly equivalent terms reports:

> "1. That a rigid adherence to the ordinary text-books of Euclid should no longer be insisted on, but that a greater freedom of demonstration should be allowed, both in Geometrical teaching and in Examination.
>
> "2. That, nevertheless, Euclid's *method* should be required in all Pass Examinations in Geometry in so far as that no axioms other than those of Euclid shall be admitted, and that no proof of a proposition be allowed which assumes the truth of any proposition which does not precede it according to Euclid's order."

Association for the
Improvement of Geometrical Teaching.

THE

ELEMENTS OF PLANE GEOMETRY.

PART II.

(CORRESPONDING TO EUCLID, BOOKS III., IV., V., VI.)

Prepared by the Committee appointed by the Association.

SECOND EDITION.

"Proficiency in Pure Geometry . . . perennially a symptom, not only of steady application, but of a clear methodic intellect, and offering in all epochs good promise for all manner of arts and pursuits."

T. CARLYLE.

LONDON:
SWAN SONNENSCHEIN, LOWREY & CO.,
PATERNOSTER SQUARE.
1888.
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PREFACE.

THE Second Part of the Elements of Plane Geometry, now submitted to the Public, has been prepared on the same lines as the First Part issued two years ago. Books III., IV., V., of the "Syllabus of Plane Geometry" have been revised, Demonstrations of the Propositions supplied, and suitable Exercises inserted.

The two parts contain the portion of Plane Geometry treated of in Euclid, Books I. to VI., with some additional matter, and afford a sufficient course for School Teaching. It will probably be found in most cases advantageous to postpone the study of Part II. of Book IV. until after a first reading of Book V.

The Association hopes shortly to publish Syllabuses of Elementary Solid Geometry, and Geometrical Conic Sections, and probably also of Higher Geometry, indicating courses of study in these Subjects suitable for school purposes.

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THE ELEMENTS OF PLANE GEOMETRY.

BOOK III.

THE CIRCLE.

SECTION I.

Elementary Properties.

Def. 1. *A* **circle** *is a plane figure contained by one line, which is called the* **circumference**, *and is such that all straight lines drawn from a certain point within the figure to the circumference are equal to one another. This point is called the* **centre** *of the circle.*

Def. 2. *A* **radius** *of a circle is a straight line drawn from the centre to the circumference.*

Def. 3. *A* **diameter** *of a circle is a straight line drawn through the centre, and terminated both ways by the circumference.*

Theor. 1. **The distance of a point from the centre of a circle is less than, equal to, or greater than the radius, according as the point is within, on, or without the circumference.**