WENTWORTH & HILL'S EXERCISE MANUALS, NO. III. GEOMETRY

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Wentworth & Hill's Exercise Manuals, No. III. Geometry by G. A. Wentworth & G. A. Hill

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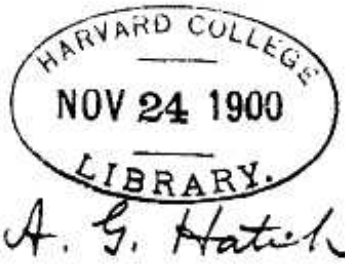

A. G. Hatch

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PREFACE.

THE aim of wisely-directed mathematical teaching is to cultivate the reasoning faculty, not the memory; and the true test of mathematical training is the *power* which the learner has acquired over original problems.

This truth is very generally recognized in teaching Arithmetic and Algebra, but very generally ignored in teaching Geometry. There are, however, many signs that a change in the method of teaching Geometry is taking place in this country. Most of the recent text-books of Geometry contain exercises designed to stimulate original thought; most papers now set in this subject for admission to college require more or less original work; and intelligent teachers are demanding a collection of suitable geometrical exercises.

The present work has been prepared to meet this demand, with the hope that it will promote a much-needed reform. It is the first work in the English language, so far as the authors know, in which the subject of geometrical exercises is systematically treated. The materials for the work have been drawn chiefly from French and German sources. The arrangement and mode of treatment are such as seem best adapted to meet the wants of American schools.

It is not intended that each student should try to work every exercise in the book, but the teacher should assign particular problems to separate students, selecting them with special reference to the capacity and skill of each pupil. With care on the part of the teacher, pupils will gain the mastery over problems in Geometry as readily as they do over problems in Algebra, and precisely in the

same way; namely, by working them out. It is necessary at first to give easy problems; but the doing of easy problems prepares the way for harder ones and still harder.

The exercises here given consist of a great number of easy problems for beginners, and enough harder ones for more advanced scholars. The exercises in each section are carefully graded, and some of the more difficult sections can be omitted without destroying the unity of the work. The book can be used in connection with any text-book on Geometry, as soon as the geometrical processes of reasoning are well understood.

A Syllabus of Geometry is given, not only for reference, but with a view of making the book by itself convenient for reviewing the study of Geometry. Lessons can be assigned consisting partly of book-work taken from the Syllabus, and partly of original work, and the two parts can be so fitted to each other that a thorough knowledge of the book-work will be necessary in order to do the original work, and the doing of the original work will firmly fix in the mind the principles involved in the book-work.

Any corrections or any suggestions relating to the work will be thankfully received.

G. A. WENTWORTH.
G. A. HILL.

PHILLIPS EXETER ACADEMY,
September, 1884.

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SYLLABUS

OF

PLANE GEOMETRY.

AXIOMS.

1. Magnitudes which can be made to coincide are equal.
2. Two magnitudes, each equal to a third, are equal to each other.
3. If equals are added to equals, the sums are equal.
4. If equals are taken from equals, the remainders are equal.
5. If equals are added to unequals, the sums are unequal in the same sense.
6. If equals are taken from unequals, the remainders are unequal in the same sense.
7. If unequals are taken from equals, the remainders are unequal in the opposite sense.
8. The whole is equal to the sum of its parts.
9. Through two points only one straight line can be drawn.
10. A straight line is the shortest line between two points.
11. Through a point not in a straight line only one parallel to the line can be drawn.