PRACTICAL DESCRIPTIVE GEOMETRY

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WILLIAM GRISWOLD SMITH

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BY

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SECOND EDITION
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PREFACE TO THE SECOND EDITION

The first edition of this book, published in 1912, represented the author's views on the presentation of Descriptive Geometry, so as to arouse the student's interest in the subject without sacrificing rigorous training in the principles.

In three years the text has been used in many schools, and the present, second edition, aims to embody the suggestions of many leading teachers of the subject, who have, at the request of the author and publishers, expressed their views as to this development.

The main idea of the first edition, that of "practicality," has been adhered to and amplified. The most important changes are:

1. The division into more chapters.
2. A more logical sequence for certain portions of the text.
3. The notation of points and planes.
4. Graphic layouts for exercises.
5. More exercises of a practical nature, embracing more lines of engineering endeavor.
6. A number of new solutions, utilizing auxiliary planes more frequently.
7. A better system of perspective drawing.
8. A chapter on the intersections of plane solids.

Although yielding to the request of several teachers for the inclusion of graphic layouts of exercises, the author still believes that dimensioned layouts are of great value despite the amount of time expended on the layout itself. With both of these, however, in practically unlimited quantity, the instructor may decide the question for himself. The layouts of both kinds have been made so flexible, by interchanging and substituting data, that the number of variations is almost incalculable. This removes the objection, expressed by some teachers, to a definite and limited number of exercises, the solutions of which are sometimes preserved by student organizations. No such collection of solutions will benefit future classes, as the exercises can be made entirely different each succeeding year.

As to the treatment of Perspective (how and how much), the author received a large amount of constructive though conflicting advice, mainly from teachers of architecture. The writer's choice is "Conical Projection," a process that is sane, in that it is a direct application of the principles of Descriptive Geometry, and is easy and swift in operation.

It has been previously stated that much interest was manifested in the revision of this work by prominent teachers in all parts of the country, and their combined opinions moulded it into its present form. The writer wishes to convey his thanks to all who assisted in this way. For special criticisms and material he acknowledges indebtedness to Professor Thomas E. French, Ohio State University; Professor Howard Moore, Colorado College; Professor Frederick C. Biggin, Alabama Polytechnic Institute; Professor Robert H. McNeilly, Vanderbilt University; Professor Chace Newman, Michigan Agricultural College; Professor H. B. Monges, University of California; Mr. Charles R. Swineford, Armour Institute of Technology.

W. G. S.

Armour Institute of Technology,
Chicago, April, 1916.

PREFACE TO FIRST EDITION

In presenting a new text-book on Descriptive Geometry, the writer is fully aware of the excellence of existing treatises, and appreciates what they have contributed toward a higher standard of technical training. The authors of these treatises, pursuing their several courses, have carried the development of the subject to a high plane.

However, in spite of the indisputable excellence of many of the text-books, they seem to have failed to arouse the interest of the student, partly by ignoring the practical applications, and partly by making only a slight attempt to present the subject attractively. Some of the books are valuable only for reference and are useless in the class room; others are incomplete in the essentials; some are faddish, emphasizing certain features and treating the rest inadequately, while even the best convey to the student only a very slight idea of the practical value of the subject. This has given rise to the belief, prevailing almost universally in the student body, that Descriptive Geometry is merely a disciplinary study, having little or no relation to the life work of the individual.

The aim of the writer has been, therefore, to present the subject to the student in a simple manner, as progressively as possible, reminding him constantly of the relation which exists between Descriptive Geometry and Practical Drafting; and to avoid needless difficulty by using language and directions of the greatest possible clarity. The writer believes that a thorough knowledge of the subject is achieved not through much study of the text, but by working exercises. To this end he has provided a large number of exercises, scattered through the text, of considerable variety and capable of infinite multiplication by the clever instructor.

An examination of the subject will reveal the following features and innovations:

1. A thorough drill in fundamentals.
2. Repetitions of statements for the sake of emphasis.
3. Notation comprehensive, yet reduced to its lowest terms.
4. Analyses separated from proofs.
5. Tabulated order of the operations in each analysis and construction.