

In former centuries mathematics was, in many minds, intimately interwoven with mysticism. A conspicuous example of this, given in Maupin's book, is the proof offered by Kepler, when he was a young man, that there cannot be more than six principal planets. He imagined the planets moving along great circles of concentric spheres so placed with respect to the five regular solids, taken in a specified order, that each solid was inscribed singly in one sphere and circumscribed about the next inner sphere. Since God created everything according to number and measure, these five regular solids determine the radii of six spheres in such a way that the radii are proportional to the distances of the planets from the sun. As there are no more than five regular solids and the number of spheres in the above arrangement cannot exceed six, there cannot be more than six principal planets.

In this early speculation Kepler is careless as to his assumptions, and does not allow himself to be controlled by the facts. Later, intercourse with Tycho Brahe and Galileo taught him the importance of accurate experimental data. Kepler's maturer reflection, in which his imagination was incessantly controlled and corrected by the facts in the case, ended in the brilliant discovery of "Kepler's Laws."

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*Leitfaden der Projections-Lehre.* Ein Uebungsbuch der konstruierenden Stereometrie. Von Professor Dr. CARL HEINRICH MÜLLER, Oberlehrer am Kaiser Friedrichs Gymnasium, Frankfurt a. M. und Professor OTTO PRESLER, Oberlehrer an der städt. Oberrealschule, Hannover. Ausgabe A. Leipzig, Teubner, 1903. 293 pp., 233 figs.

THE German student is taught the principles of drawing, perspective, and the elements of descriptive geometry before leaving the gymnasium. While not, on the whole, having as much of what is usually taught in America under the name of solid geometry, the average student who has completed the course in a realgymnasium or realschule has much more definite ideas of the visual properties of space than the average freshman in our colleges and technical schools.

Until recently, very few good books existed on constructive geometry, as it is taught almost entirely by use of a brief syllabus and a great deal of practice. The present volume is therefore somewhat of an innovation, representing the modern tendency to prepare text-books on all elementary mathematical subjects.