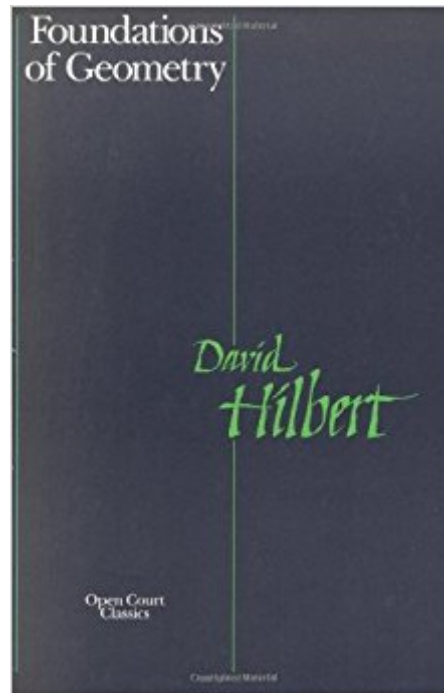




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Foundations Of Geometry



Synopsis

Along with the writings of Hilbert's friend and correspondent Frege, Hilbert's *Foundations of Geometry* set the stage for Russell and Whitehead's *Principia Mathematica*. Hilbert presents a new axiomatization of geometry to algebra, and introduces the distinction between mathematics and metamathematics, with a new theory of proof.

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Customer Reviews

David Hilbert's "Grundlagen der Geometrie" is a work of great significance for anyone interested in mathematical foundationalism, the history of geometry, and intellectual history and philosophy in general. Sadly, however, the translation of this edition is extremely poor --- not simply awkward, or rough, but careless to the point of making the text unreadable. If I did not have access to the German original, I would have long ago given up on making sense of the translation. In Theorem 7, for example, it speaks of "points which are not on the plane alpha." The German is extremely ambiguous, but mathematically it only makes sense if you interpret the sentence as referring to the "line a." On page 31, the translator commits the unpardonable error of mistaking "nun" (now) for "nur" (only). At the end of theorem 34, an entire equation was left out, and the meaning of the sentence completely bungled. Most extraordinary is Theorem 35, where what should be translated as "It follows from Theorem 22 that the sum of two angles of a triangle is less than two right angles" becomes "the sum of the angles of a triangle is less than two right triangles." In the very next sentence, "mithin" is interpreted as "hence," implying a direct logical entailment where there is none.

It should have been rendered simply as "of course." Finally, in the next paragraph, it reads "where epsilon denotes any angles." The German has "irgendeinen Winkel" --- unambiguously singular. Given the tremendous importance of Hilbert's Foundations, it is quite sad that there is not a quality translation available.

Hilbert gives his new system of axioms and studies their consistency, independence and necessity. Consider for example the theorem that the angle sum in any triangle cannot be greater than two right angles. We can prove it as follows. Consider a triangle ABC with the angles labelled so that ABC

This historic book is available for free from Project Gutenberg [...] Search for Geometry. This book is one of a few books available. This is the complete Open Court text. It is available both as a pdf file and a TeX file.

Unlike other books of geometry, the author of this book constructed geometry in an axiomatic method. This is the feature which differs from other books of geometry and the way I like. Let's see how the author constructed axiomatized geometry. Intuition and deduction are two powerful ways to knowledge. The axioms are the intuitive principles which are needless to be proved. The theorems are the demonstrated propositions which are deduced from axioms. Although axioms are intuitive, they may have the demonstrated propositions called theorems which contradict. If they do, the system of the axiomatized geometry would break down. Because it has some false propositions if you think the contradictory ones as truth, and vice versa. There are all the discussions of the problems above in chapter 2 called consistency which is very important in an axiomatic system.

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