On Translations of Hilbert's Grundlagen

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Thanks to Jemma Lorenat for an intriguing behind the scenes look into the often unsung efforts of the translator, in this case E. J. Townsend for the 1902 Open Court Press edition of Hilbert's *Grundlagen der Geometrie*.¹ It inspired me to take a new look at the subsequent translation from Open Court in 1971 of the tenth edition of *Grundlagen*, where the translator was one Leo Unger. Unlike Townsend, who provided a preface, Unger makes no appearance beyond the title page. He published two papers in *Mathematics Magazine*, where his affiliation is given as Litton Industries, the only personal information I have found thus far.

I've also not found a review of this 1971 edition, let alone authoritative critiques of the translation such as Townsend's underwent. Unger's translation is often cited, reads smoothly, and a check of the major points given in Hedrick's review, which overlap some of Halsted's, confirms a careful job, *except* for one peculiar oversight. This happens to be the same phrase near the end of Chapter VII that elicited Halsted's coup de grace in his attack described by Lorenat: Unger, like Townsend, has Hilbert asserting the false statement that "every regular polygon can be constructed by only drawing straight lines and constructing segments" (p. 106). How could Unger manage to duplicate the "blunder"? Hedrick diplomatically believed, as Lorenat indicates, that this "will scarcely mislead anyone," but it does remain at least "curious," as Hedrick put it. Since the original 1899 edition had "jene regulären Polygone" it appears that Hedrick's conjecture cited by Lorenat could hold for Unger as well, namely that "jene" ("the above-mentioned" as Townsend later corrected it to) despite the plural construction was misread as some form of "jede" ("every"). By the tenth edition in 1968, not only were appendixes and supplements added, the 1899 text was also revised in places.

This particular passage, however, remained the same through at least the ninth edition of 1962, the latest available to me. It is interesting to note as an aside that some revisions may have been influenced by Hedrick, since a couple of passages where Hedrick identifies some ambiguities have been redone in the German. His letters to Hilbert in the Göttingen archives may reveal more.

The 1900 French translation, with new material supplied by Hilbert, is also free of this error, for it faithfully offers "tous ces polygones réguliers." In any case, it appears that Townsend relied on it mainly for the new material. It is unlikely but conceivable that in spite of the significant differences between them throughout, Unger consulted Townsend's original version. However, he could only have contracted this error from the first printing and, even then, before the errata sheet reproduced in Lorenat's article was added to distributions. Type was reset in subsequent printings of Townsend incorporating the emendations. It seems more likely that Unger did not look closely at Townsend's translation or at reviews of it, and that our two translators were not closely following the mathematics and simply made the same misreading.

Perhaps Halsted and Hedrick are exceptional mathematical reviewers; the former was a translator into English from German, Latin, Russian, and French (for example Hilbert, Saccheri, Tolstoy, and Poincaré, respectively) and the latter also a translator of French and German and a student of Hilbert. In Halsted's case, if my biography of him gets off the ground, it will provide further evidence that the critical reviewer mode was practically his permanent state. Still, without such careful reviewers we may well wonder about the quality of translations in the literature today.

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Editors' Note: For more on the complicated issue of translation, see Michael Friedman's Years Ago column "On Mathematical Towers of Babel and 'Translation' as an Epistemic Category" in the present number.

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¹A Competent Translation/A Pitiful Bungle: The Foundations of Geometry. *Mathematical Intelligencer* 43:3 (2021), 61–70.