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*Not set in stone: nineteenth century geometrical constructions and the Malfatti Problem*

In 1803, Gian Francesco Malfatti posed the problem of constructing three parallel cylinders of maximal volume from a marble triangular prism. He then reduced the problem to that of inscribing three mutually tangent circles in a triangle. This apparently equivalent construction reappeared repeatedly through the nineteenth century. A decade after Malfatti, Joseph-Diaz Gergonne posed the problem to the readers in the first issue of his *Annales*. In the same volume, he gave one of the three analytic solutions, admitting that he had struggled for several years. The construction gained a wider audience when Jakob Steiner offered a purely synthetic treatment in his 1826 article published in the first volume of *Crelle's Journal*. Many, including Gergonne, found Steiner's proof incomplete, and alternative approaches continued to emerge in France, Germany, and later Britain and the United States. The so-called Malfatti problem gained notoriety in recent decades when the accepted reduction was shown to be false – in fact, three mutually tangent circles never provide the optimal solution (Zalgaller and Los, 1992). Nevertheless, the dispersion of the Malfatti problem provides an illustrative thread through the evolution of nineteenth century geometry. From this perspective we observe efforts towards developing general theories to encompass the approaches for particular problems, the differentiation and competition of geometric methodologies, and the nationalization and internationalization of mathematical communities.