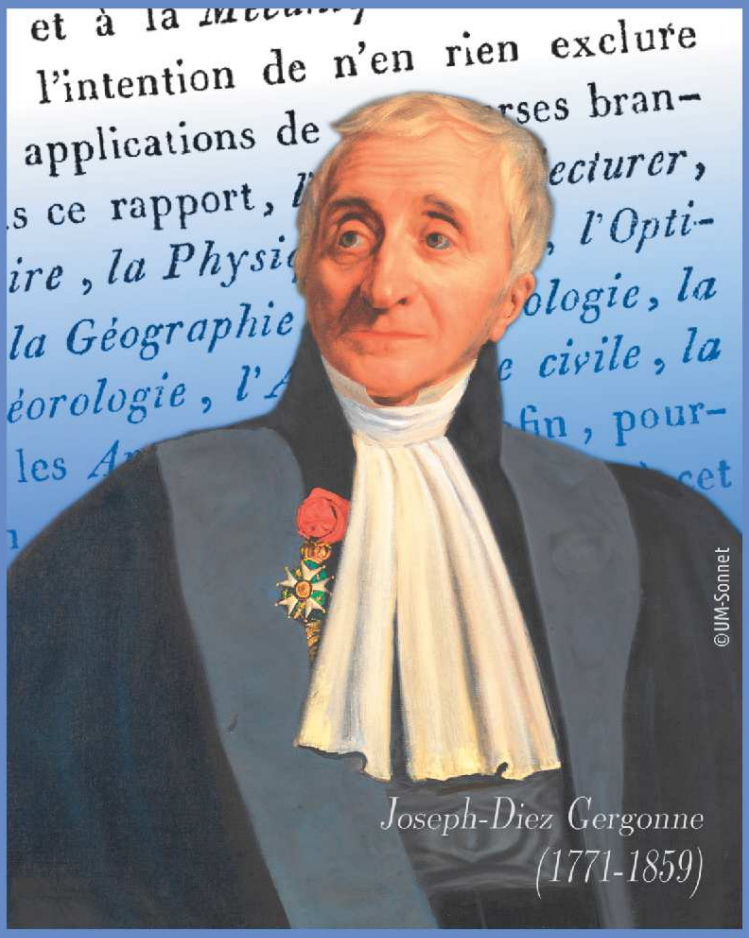
International Study Group
on the Relations Between the

History and Pedagogy of Mathematics

Proceedings of the 2016 ICME Satellite Meeting



HPM 2016

Montpellier, July 18-22, 2016

Edited by:
Luis Radford
Fulvia Furinghetti
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Table of contents

HUMANITIES AND SCIENCES ON MACH'S IDEAS FOR A HIGHER EDUCATION

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Mach and mathematics education

Mach's position on humanities/sciences dichotomy regarding young people's education is illustrated, stressing his ideas regarding the importance of mathematics teaching.

According to the famous Austrian physicist and philosopher Ernst Mach (the centenary of whose death falls in 2016), studying science – in particular mathematics – proves to be fundamental in helping man to observe and understand the world around him and thus to act in an "economic" way (see, e.g., Mach 1889, pp. 577ff.); with this viewpoint, scientific education should be strongly pursued. There are in fact illuminating examples of application of Mach's ideas in mathematics education of his time (see Zuccheri & Zudini 2008).

The formative value of mathematics and sciences

Über den relativen Bildungswert der philologischen und der mathematisch-naturwissenschaftlichen Unterrichtsfächer der höheren Schulen is the significant title of a conference held in 1886 by Mach and contained in his *Populär-wissenschaftliche Vorlesungen* (Mach 1896, pp. 338-374). Mach shows himself to be a very modern scholar in his treatment of the relationship between humanities and sciences and their formative value. He argues that, within the cultural development of his time, humanities cannot be considered any longer to be the only (nor even the better) means to offer a higher education.

Mach counters the usual arguments in favor of the supremacy of humanistic culture with the greater value and effectiveness of teaching mathematics and science (which for certain formative aspects cannot be separated). He gives specific examples, claiming their superiority with regard to educational aims and for the development of ability in observation and logic (see Mach 1896, pp. 344ff.). He provides a series of directions to be implemented for an improvement of mathematics and science education (see Mach, 1896, pp. 364ff.).

REFERENCES

Mach, E. (1889). *Die Mechanik in ihrer Entwicklung historisch-kritisch dargestellt. 2. Edition*. Leipzig: Brockhaus [English translation *The science of mechanics: A critical and historical account of its development*]. Chicago: Open Court, 1989.

Mach, E. (1896). *Populär-wissenschaftliche Vorlesungen*. Leipzig: Barth. English translation: *Popular scientific lectures*. Chicago: Open Court, 1898.

Zuccheri, L., & Zudini, V. (2008). The “Jacob Method”: An example of application of cognitive theories in the period of the introduction of calculus in Austrian secondary mathematics instruction. *The International Journal for the History of Mathematics Education*, *3*(2), 57-64.