

FROM MERSENNE TO ROBARTES: THE TRUMPET, THE TRUMPET MARINE, AND THE DISCOVERY OF THE HARMONIC SERIES

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ABSTRACT

Because they rely on the harmonic series for all their tones, the trumpet and the trumpet marine were frequently invoked as case studies in early attempts to explain overtones. Marin Mersenne, was the first scholar to describe overtones in any detail, mentioning them initially in *Quaestiones celeberrimae in Genesim* (1623) and continuing to refine his thoughts on the subject in correspondence he carried on with other scientists. Mersenne convinced his colleagues that he could hear “little delicate sounds” (*petits sons delicats*) above the fundamental tone (*son propre*), but he could not explain how they were produced. In his *Harmonie universelle* (1636) Mersenne described overtones up to the sixth harmonic. He understood the similarities between “trumpet notes” and the tones produced by the trumpet marine, but he failed to recognize a relationship between these notes and overtones. Moreover, he ignored trumpet notes that did not conform to his theory of consonance. My paper reveals how later authors expanded on Mersenne’s work. John Wallis’ demonstration of nodes in vibrating strings (1677) strongly influenced Francis Robartes’ “Discourse on the Musical Notes of the Trumpet and the Trumpet Marine” (1692). Robartes (Roberts) did not set out to elucidate the harmonic series; his modest objective was to explain why the seventh, eleventh, thirteenth, and fourteenth notes of the trumpet are not in tune. He compared the “flageolet tones” of the trumpet marine with the notes of the trumpet and demonstrated mathematically that the four out-of-tune notes cannot be accommodated to just intonation. Without realizing the importance of his discovery, Robartes offered the most cogent demonstration of the harmonic series prior to that of Joseph Sauveur (1701).