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19. History of Mathematics

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A triple crisis of irrationality, in music, in mathematics and astronomy
By explicating that the simple fractions 1/2, 2/3 and 3/4 underlie the perfect consonances of the octave, fifth and fourth, the monochord experiment of Pythagoras meant that going up one musical interval corresponds to multiply the length of the string by a factor. This result led naturally to the construction of a tuning for the diatonic scale based on gaps of pure fifths and octaves, that would culminate with the perception of the inadequacy of these cycles that resulted from the impossibility of solving $(2/3)^n = (1/2)^m$ for m, n integers. By presenting the heuristic power of this crisis, this paper intends to remake its meaning and emphasize its semantic proximity to irrationality in mathematics and to unadjusting in calendars.