

# Syntonic Experiments

Thomas Noll / Daniel Muzzolini

Art of Diagram (online)

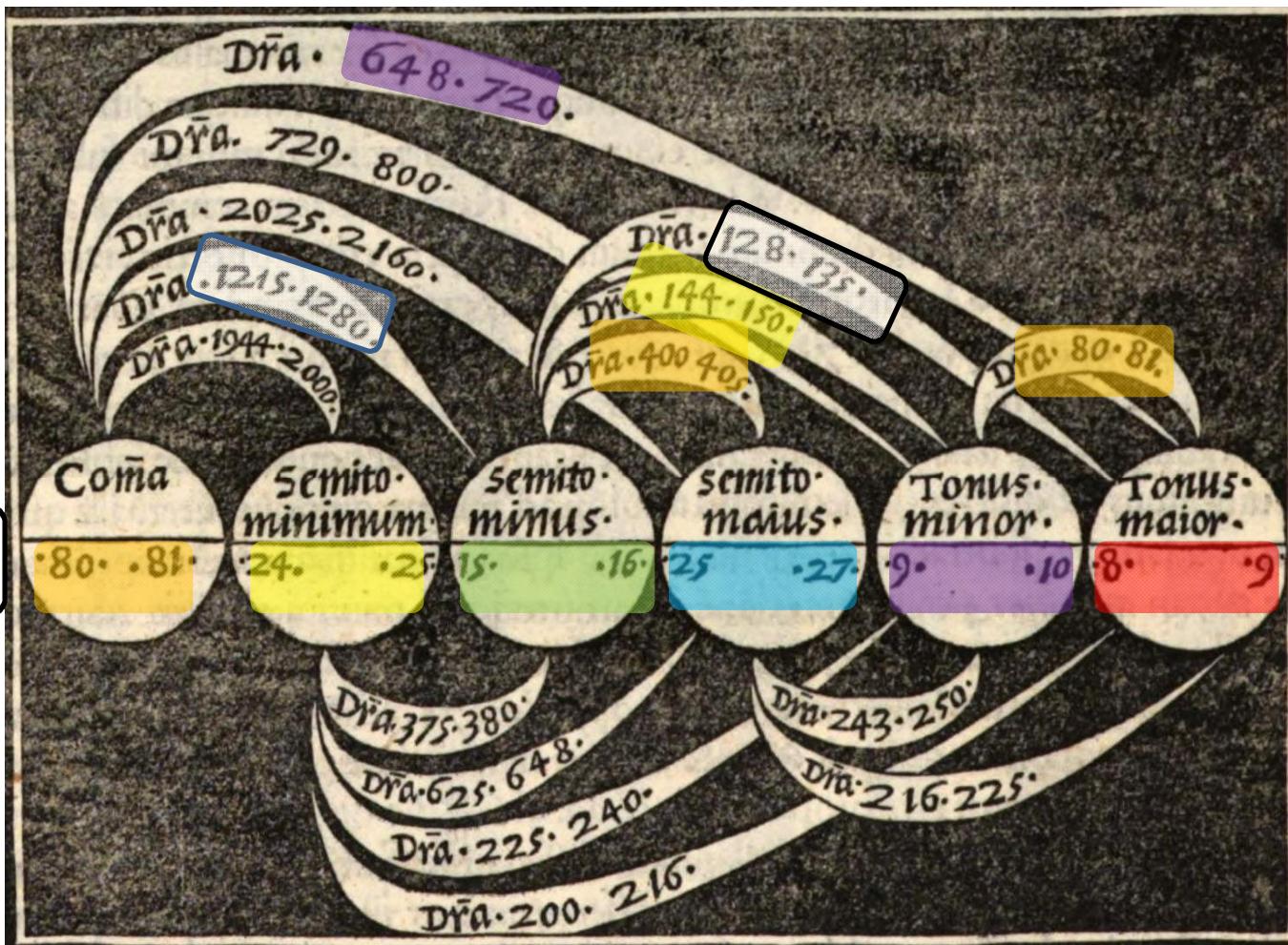
24. June 2021

# Boethius: just major thirds?

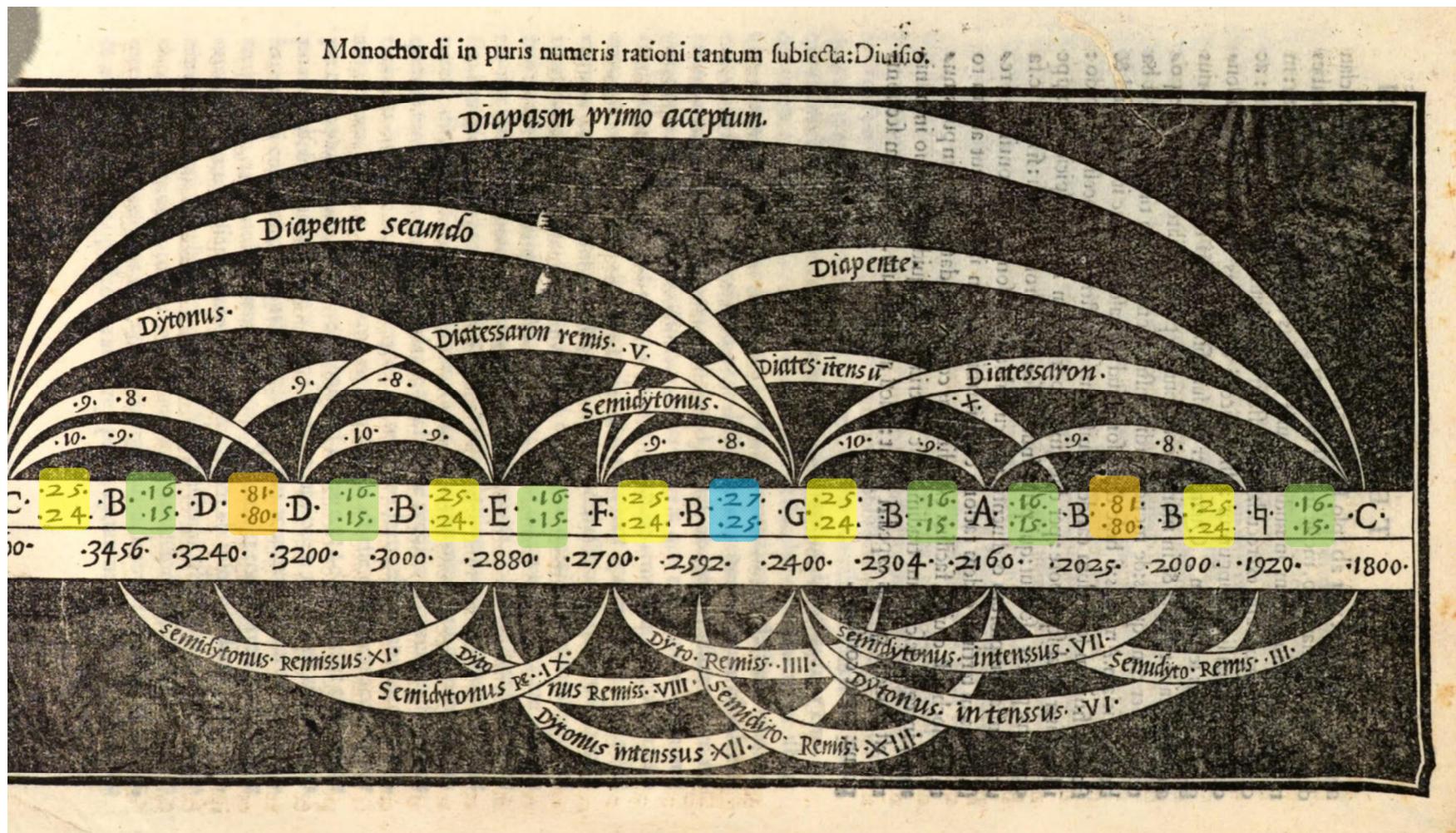
LATITUDO					
I	III	XVI	LXVII	CCLVI	XXXVII
V	XX	LXXX	CCXXX	ICCLXXX	
XXXV	C	CCC	IDC		
CCLXV	D	II			
DCLXV	IIID				
	IIIICDXXV				

*Id est harmonia mundi consonans.*

# Fogliano (1529): A complete graph for syntonic interval differences

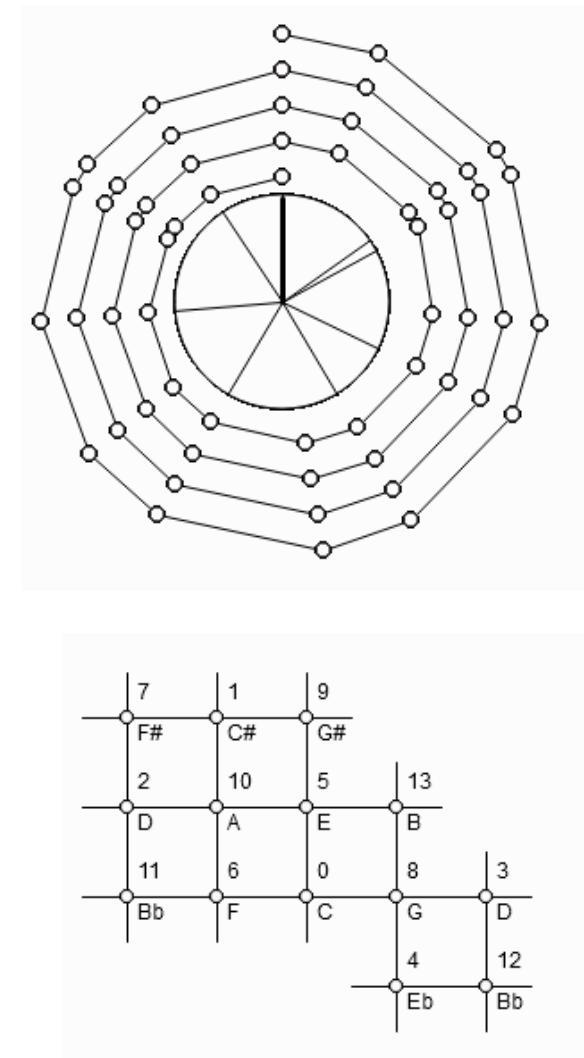
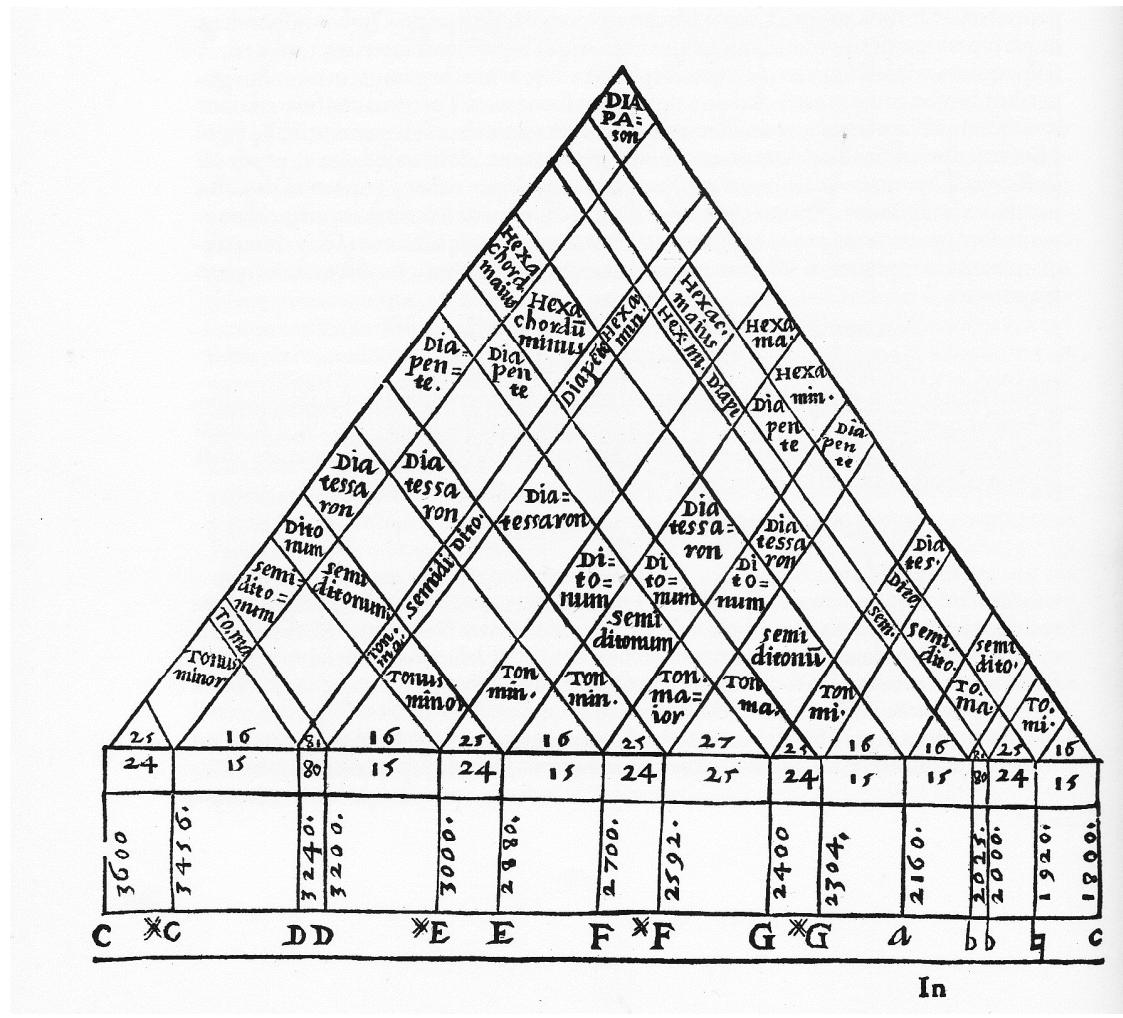


# Fogliano (1529)

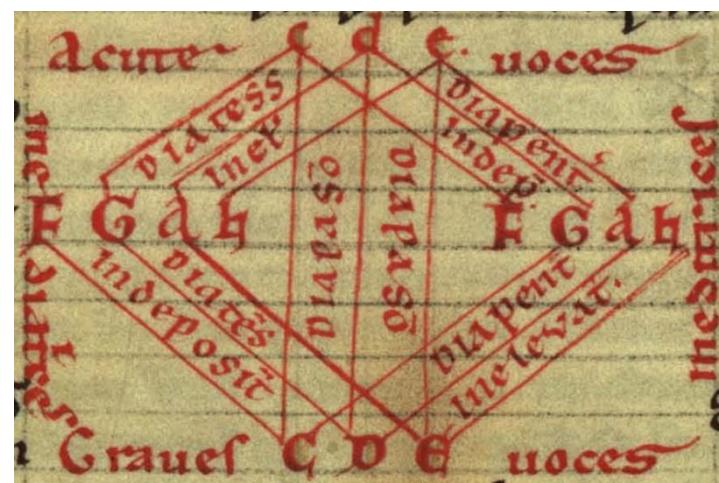
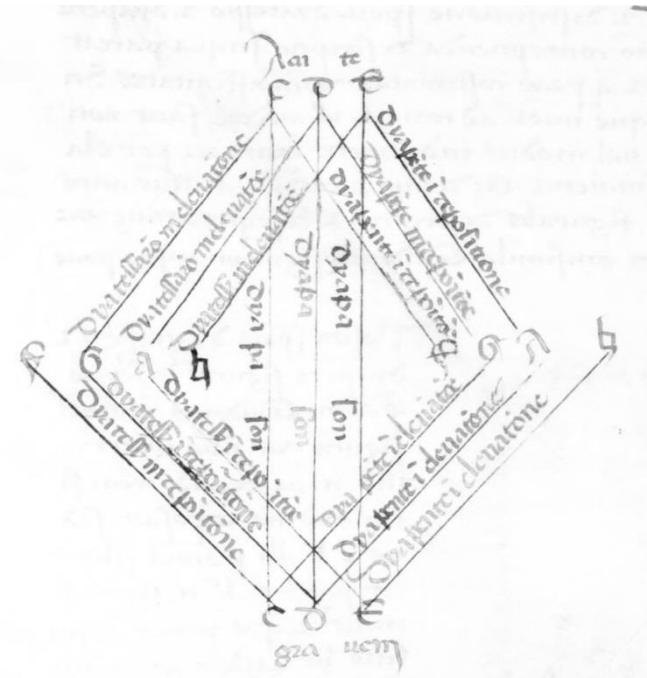
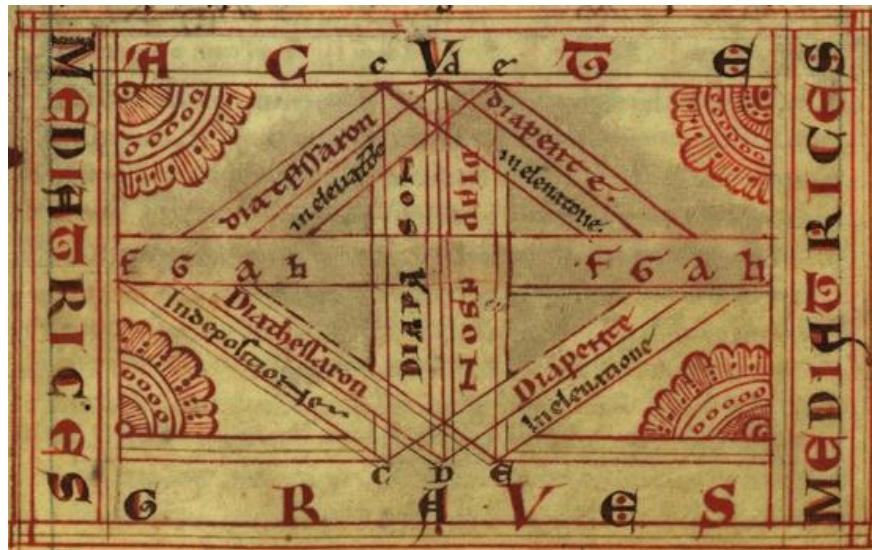


## Just intonation chromatic scale with two syntonic commas

Fogliano (1529) = Salinas-14 (1577)

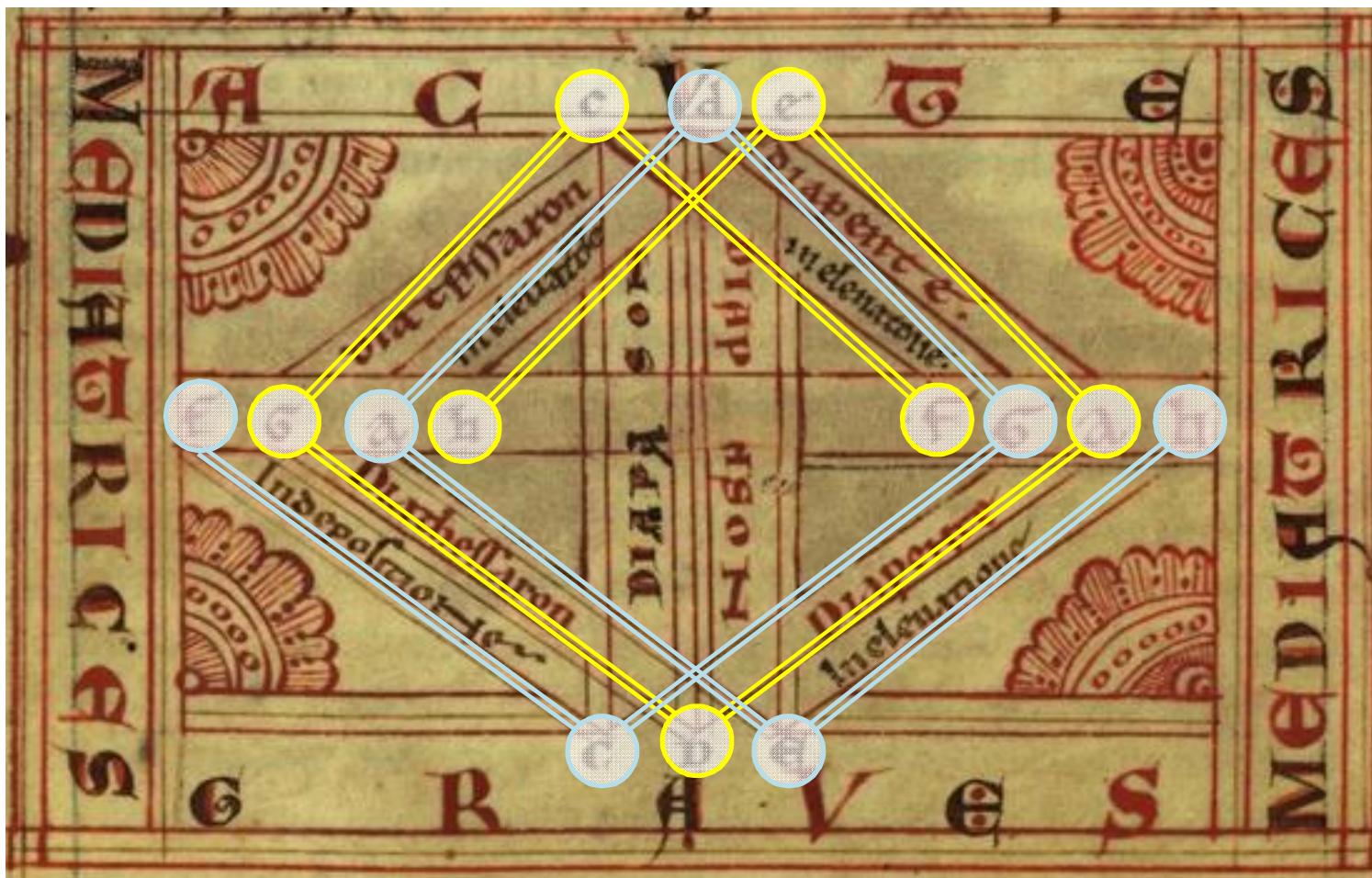


# Spiraling fifths and fourths

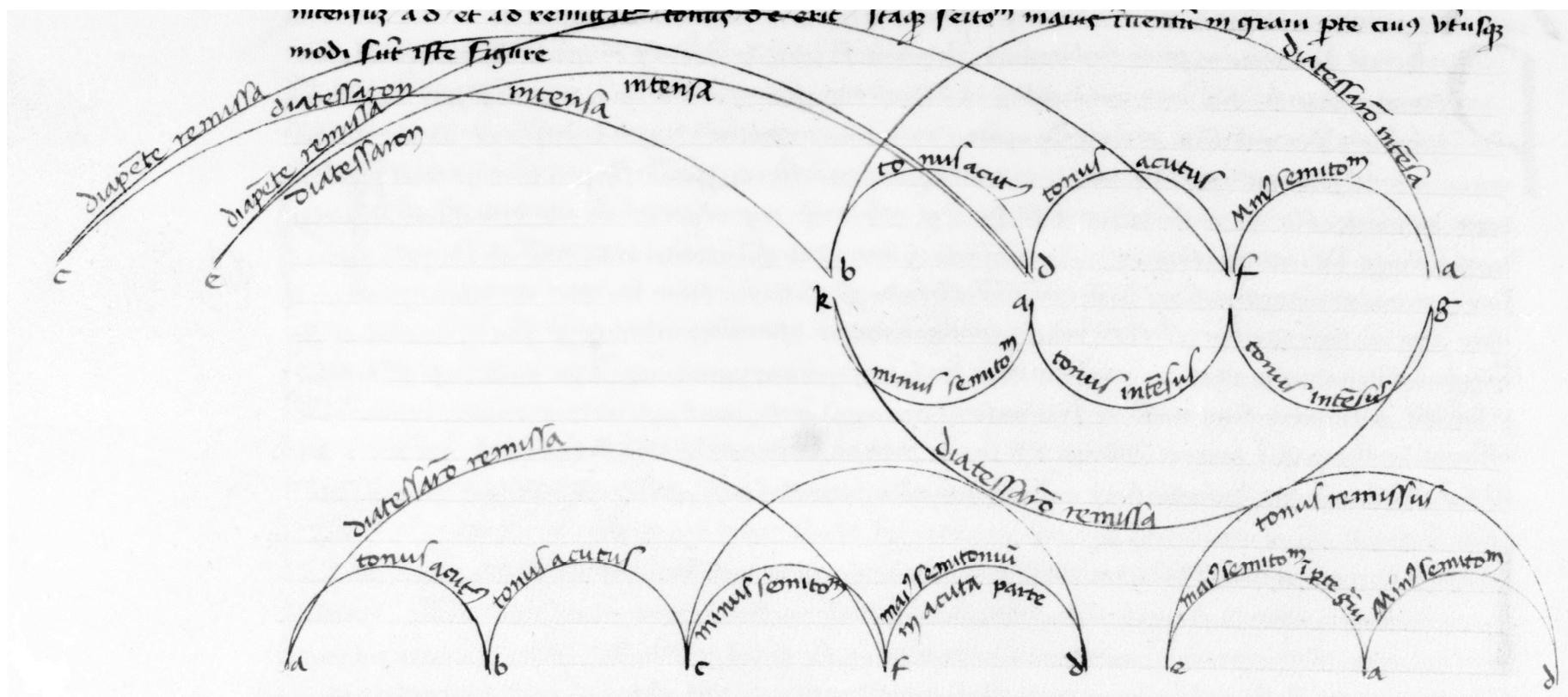


# Pythagorean tuning

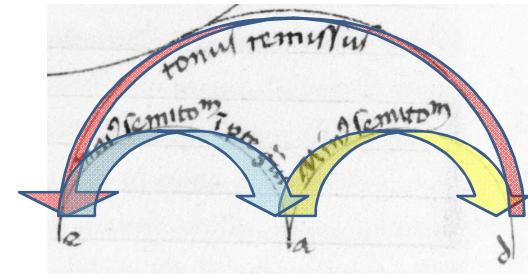
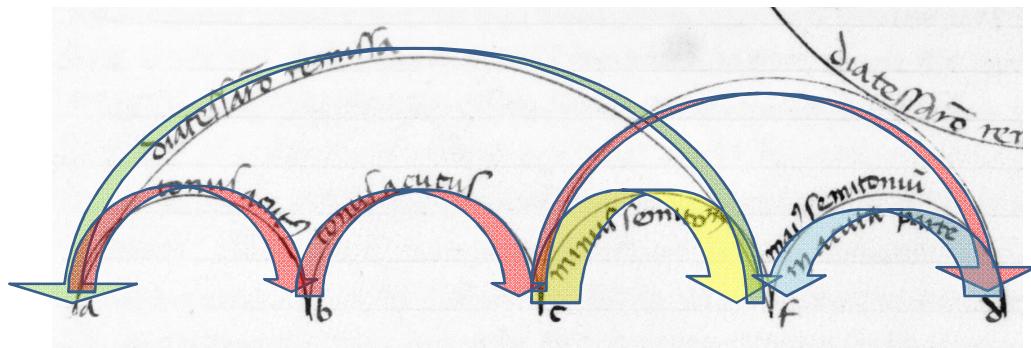
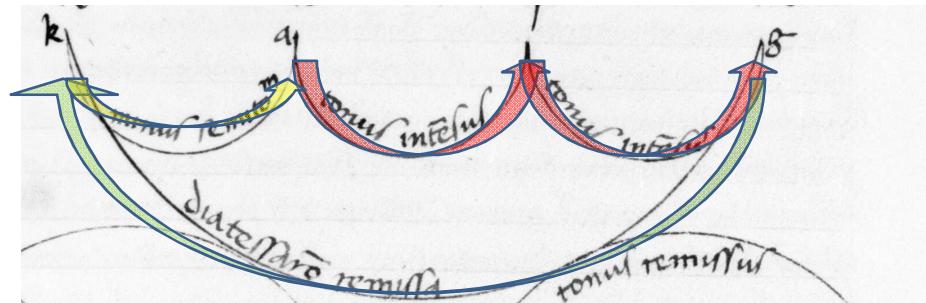
# Spiraling fifths and fourths



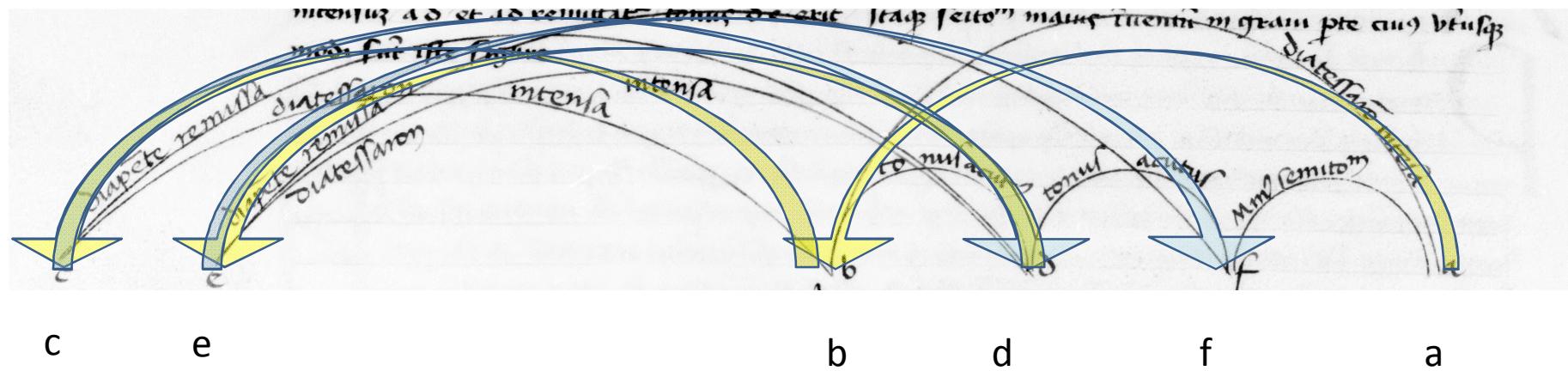
# Leodiensis



# Leodiensis



# Leodiensis: Hexachord



# 1619\_Kepler\_Lib\_III\_27\_derivationConsonances.jpg



# Nicolas Mercator (c. 1665)

<i>A</i>	<i>C</i>	<i>E</i>	<i>G</i>	<i>9</i>	<i>D</i>	<i>septem pthongi in octava, sive clavis diaconica colore palmalarum descinella a chroma tisis</i>
<i>F</i>						
<i>1</i>	<i>5</i>	<i>3</i>	<i>15</i>	<i>9</i>	<i>45</i>	
					<i>27</i>	
<i>tertia major</i>		<i>tertia major</i>			<i>tertia major</i>	
<i>Unisonus vel ottava</i>	<i>Quinta uni- sonis velocita- ta)</i>	<i>Quinta uni- sonis velocita- ta)</i>	<i>Quinta uni- sonis velocita- ta)</i>			

sharp

	<i>F<sup>#</sup></i>	<i>C<sup>#</sup></i>	<i>G<sup>#</sup></i>	
<i>D</i>	<i>A</i>	<i>E</i>		<i>h</i>
<i>F</i>	<i>C</i>	<i>G</i>	<i>D</i>	
	<i>A<sub>b</sub></i>	<i>E<sub>b</sub></i>	<i>B</i> ⟨nat: or <sup>b</sup> flat⟩	<i>F</i>

# Nicolas Mercator (c. 1665)

$A \quad E \quad G \quad 9 \quad D$       { septem phthongi  
 F      C      G      9      15      in octava, sive  
 clavis diaconica  
 colore palmalarum  
 distincta a chroma  
 tenuis

$\frac{1}{5}$ <small>tertia major</small> Unisonus vel ottava	$\frac{3}{15}$ <small>tertia major</small> Quinta (uni- sonus velocita- ta)	$\frac{9}{45}$ <small>tertia major</small> Quinta (uni- sonus velocita- ta)	$\frac{27}{}$ <small>tertia major</small> Quinta (uni- sonus velocita- ta)
--	---	---	--

$\frac{24}{25} \quad \frac{15}{16} \quad \frac{15}{16} \quad \frac{120}{135} \quad \frac{15}{16} \quad \frac{24}{25} \quad \frac{125}{27} \quad \frac{15}{16} \quad \frac{24}{25} \quad \frac{15}{16} \quad \frac{34}{25} \quad \frac{125}{27} \quad 0$

A      0 # 0      0      10      0      0 # 0      0      0      0      0      0      0

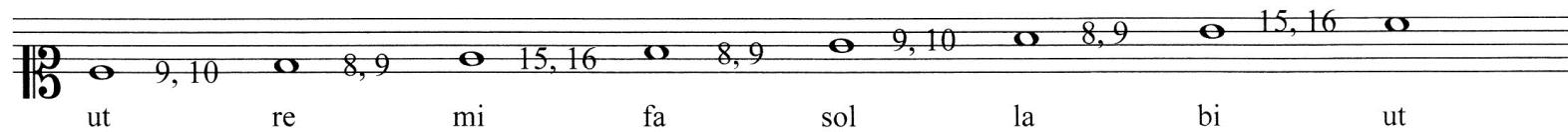
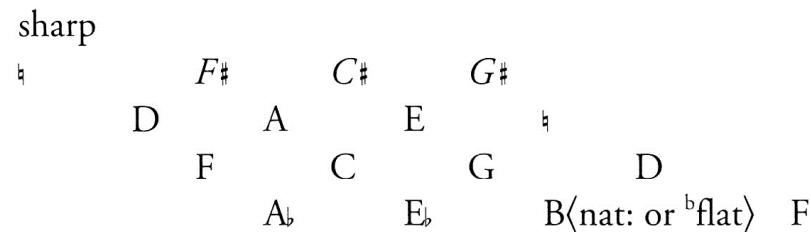
se:mi:/ sem:aj:/ semi:med./se:maj:/ sem:min:/sem:max/sem:aj:/sem:min/sem:ma:j:/se:mi:/sem:max

6      0      0      0      0      0      0      0      0      0      0      0

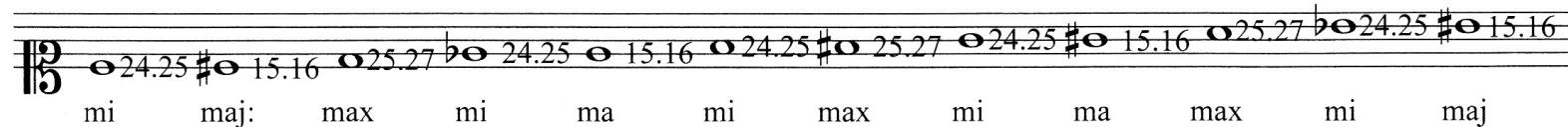
ton:min [to:maj/sem:maj/ton:maj/] ton:min/sem:maj/to:major

# Mercator 'Of Musick' (2), fol. 36v, 2013\_BeW\_227

*Of the Musicall Scale.<sup>9</sup>*



Here are three toni majores, two ⟨toni⟩ minores, and two semitonia majora in an eighth.



# Nicolas Mercator (c. 1665)

*quam octonaria*

The handwritten score consists of three staves of music. The top staff shows a sequence of time signatures:  $\frac{24}{25}$ ,  $\frac{15}{16}$ ,  $\frac{15}{16}$ ,  $\frac{120}{135}$ ,  $\frac{15}{16}$ ,  $\frac{24}{25}$ ,  $\frac{25}{27}$ ,  $\frac{15}{16}$ ,  $\frac{34}{25}$ ,  $\frac{15}{16}$ ,  $\frac{34}{25}$ ,  $\frac{25}{27}$ ,  $\frac{25}{27}$ . The middle staff has note heads with numbers: 0, #0, 0, 10, 0, 0, #0, 0, 10, 0, 0, #0, 0. The bottom staff has note heads with numbers: 6, 0, #0, 0, 10, 0, 0, #0, 0, 10, 0, 0, #0, 0. Below the staves are labels: 'se:mi:' [semibreve], 'semaj:' [semiquaver], 'sem:med.' [semimbreve], 'se:maj' [semiquaver], 'sem:min' [semibreve], 'sem:max' [semiquaver], 'sem:min' [semibreve], 'semmaj' [semiquaver], 'semi' [semibreve], 'sem:max' [semiquaver]. The bottom staff also has labels: 'ton:min' [tonus minor], 'ton:maj' [tonus major], 'se:maj' [semiquaver], 'ton:min' [tonus minor], 'ton:min' [tonus minor], 'sem:maj' [semiquaver], 'ton:major' [tonus major].

ut              re              mi              fa              sol              la              bi              ut

Here are three toni majores, two ⟨toni⟩ minores, and two semitonias majora in an eighth.

mi              maj:              max              mi              ma              mi              max              mi              max              mi              maj