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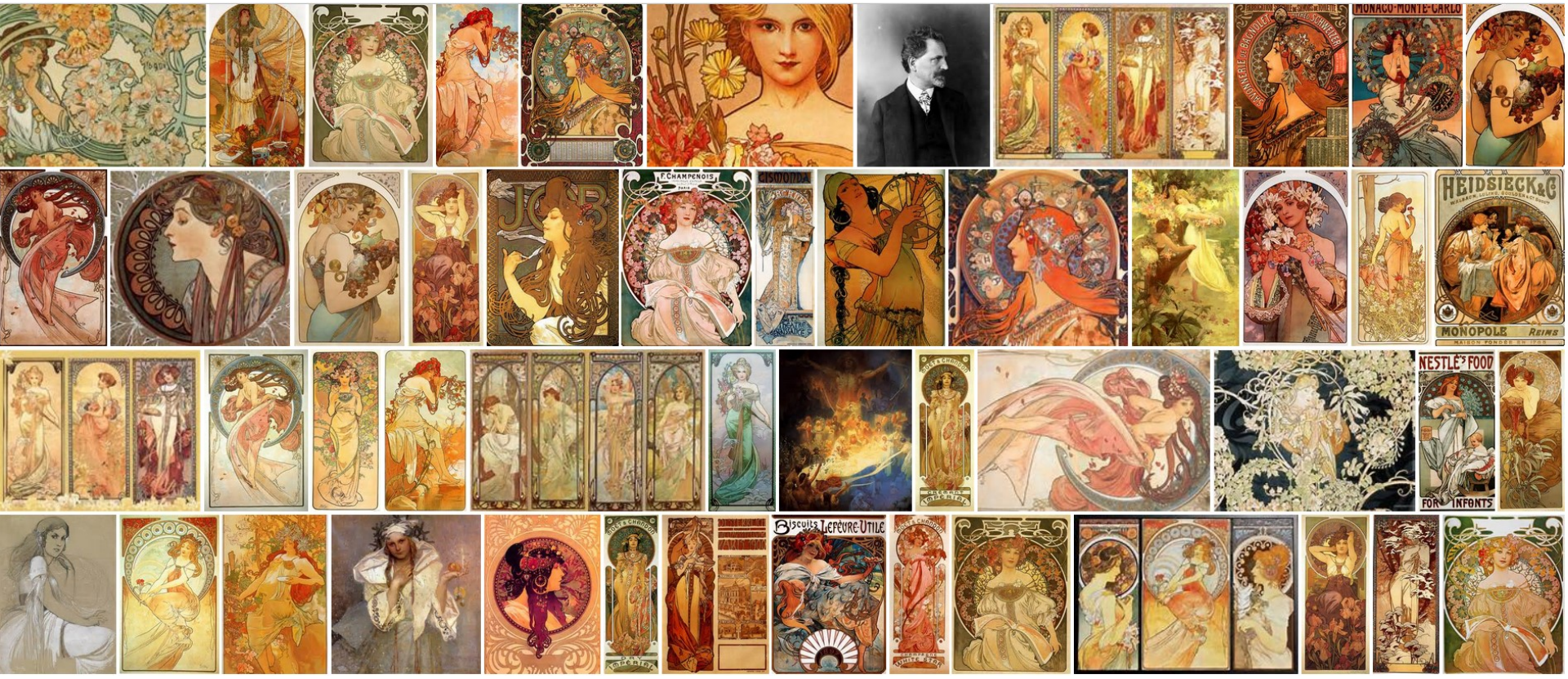
On my new audiovisual work

November 2015

Internet image search “Alfons Mucha”



Alphonse Mucha (early 1890s) at ca. 30

Mucha: The seasons (1896)

Mucha: The seasons (1990)

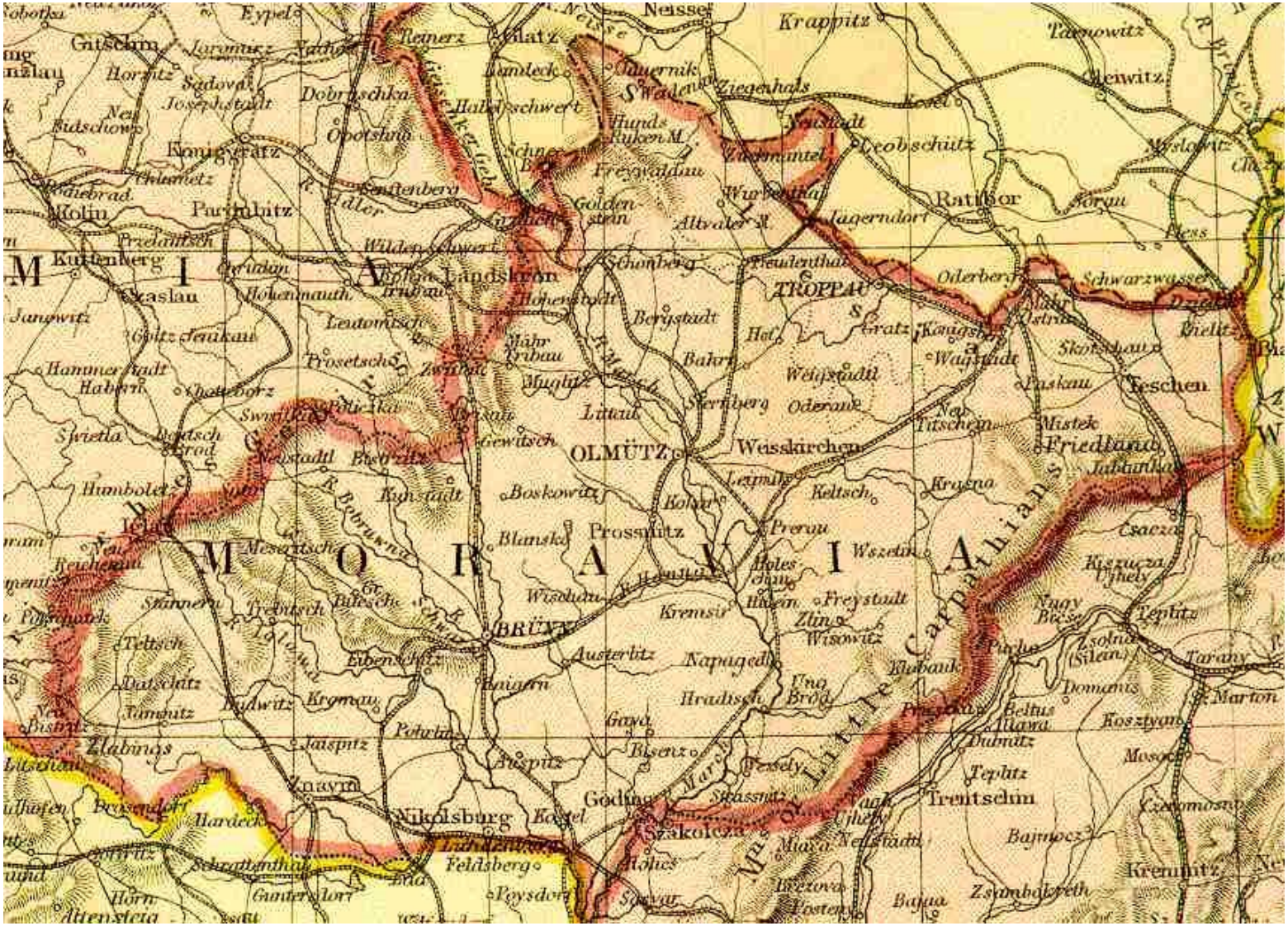
John Mucha (grandson, center) visiting Raj and Grace Dhawan in Beverly Hills

Mucha:
Gismonda (1894), *La Samaritaine* (1897)

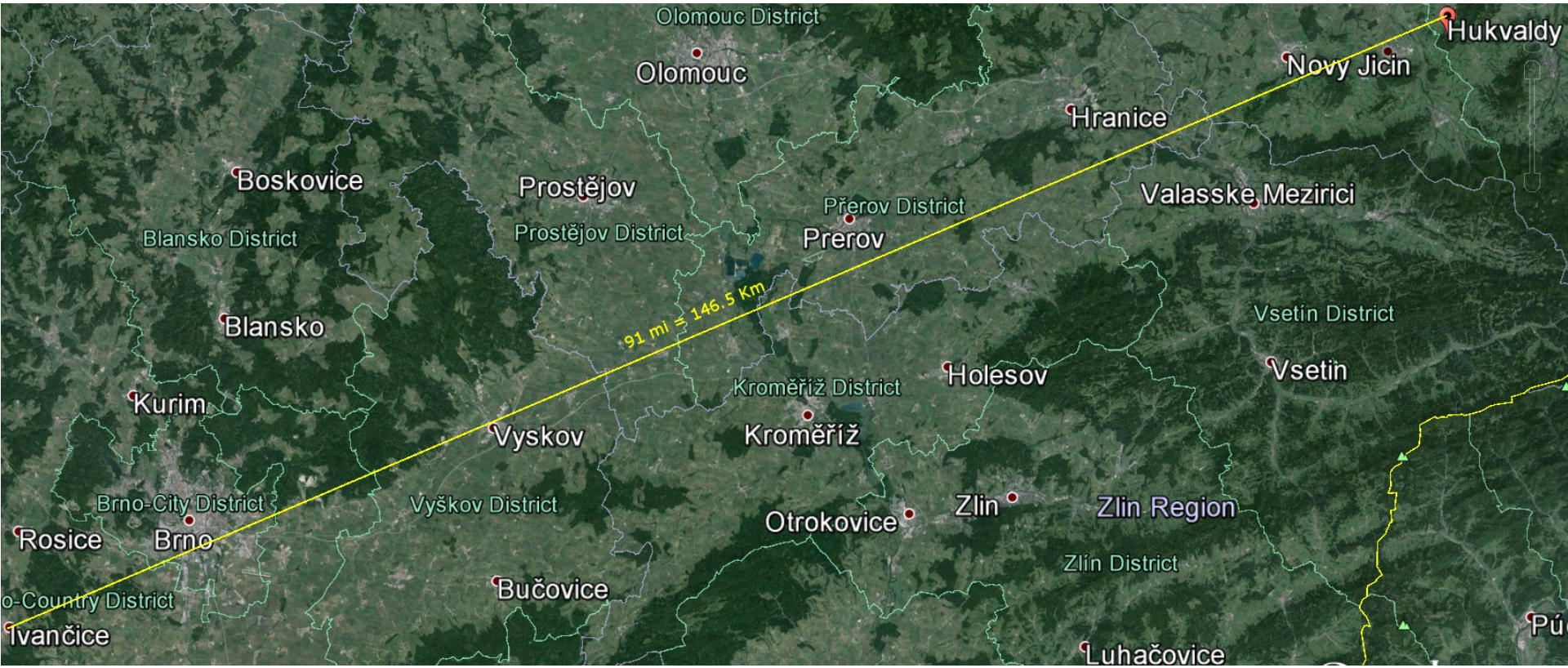
Leoš Janáček (1881), at 27

Austrian Empire, mid 19th Century

Moravia, mid-19th Century



Birthplaces of Mucha and Janáček in present-day Moravia



St. Thomas' Abbey, Brno

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37 Mucha works ↔ 37 Janáček works

37 paintings against 37 pieces

year	page	Mucha	√area=duration	year	Janacek
1894	[01]	Gismonda with remarke by Mucha	49.61"	1897	On an Overgrown Path 1
1895	[04]	Sarah Bernhardt, American Tour	49.61"	1897	On an Overgrown Path 2
1895	[05]	Revue pour les Jeunes Filles	31.02"	1897	On an Overgrown Path 4
1896	[08]	Zodiaque	22.23"	1897	On an Overgrown Path 7
1896	[09]	Lorenzaccio, Variant 2	24.24"	1897	On an Overgrown Path 10
1896	[06]	JOB	21.89"	1905	Piano Sonata "from the street" I
1896	[45]	L'Energie Francaise	10.62"	1905	Piano Sonata "from the street" II
1897	[28]	Salon des Cent XXme Exposition	9.19"	1908	On an Overgrown Path 3
1897	[29]	Salome, Estampe Moderne	11.15"	1908	On an Overgrown Path 5
1897	[47]	La Plume, May 1897 Issue 194	8.53"	1908	On an Overgrown Path 6
1897	[12]	La Samaritaine	39.61"	1908	On an Overgrown Path 8
1897	[17]	La Fleur 1897	21.33"	1908	On an Overgrown Path 9
1897	[33]	Vin des Incas, Variant 1	8.71"	1914	Violin Sonata I
1897	[16]	Tetes Byzantines-Brunette	19.60"	1914	Violin Sonata II
1897	[15]	Tetes Byzantines-Blonde	19.60"	1914	Violin Sonata III
1897	[10]	Sarah Bernhardt, La Plume	22.45"	1914	Violin Sonata IV
1897	[13]	Monaco, Monte-Carlo	35.15"	1923	Str.Q.#1 (Kreutzer) I
1897	[27]	Bieres de la Meuse	9.29"	1923	Str.Q.#1 (Kreutzer) II
1898	[14]	Reverie. Variant 4	24.85"	1923	Str.Q.#1 (Kreutzer) III
1898	[18]	La Tosca	24.80"	1923	Str.Q.#1 (Kreutzer) IV
1898	[49]	Cocorico, December 31, 1898 (1st Issue)	10.34"	1924	Youth I
1899	[43]	La Pater	11.40"	1924	Youth II
1899	[20]	Flirt Biscuits Lefevre-Utile	17.22"	1924	Youth III
1899	[50]	Cocorico	10.34"	1924	Youth IV
1899	[70]	Cover for L'illustration Christmas 1896	14.83"	1925	The Makropoulos Affair
1900	[21]	Le Rubis (Ruby)	15.49"	1926	Sinfonietta I
1900	[32]	Praha-Parisi cover for 1900 World Fair	14.14"	1926	Sinfonietta II
1900	[19]	Paris 1900, Austria at the World Fair	32.25"	1926	Sinfonietta III
1902	[23]	Cycles Perfecta	50.13"	1926	Sinfonietta IV
1902	[31]	Nectar	8.77"	1926	Sinfonietta V
1903	[24]	Lefevre-Utile, Sarah Bernhardt5	24.42"	1927	Glagolitic Mass 1
1903	[48]	Paris Illustre, 1903, Christmas Issue	13.92"	1927	Glagolitic Mass 7
1907	[56]	Slavia Mutual Insurance Bank Policy	13.04"	1927	Glagolitic Mass 8
1908	[34]	Cover for Literary Digest	10.39"	1928	Str.Q.#2 (Intimate Letters) I
1922	[55]	Hearst's International, January 1922	13.10"	1928	Str.Q.#2 (Intimate Letters) II
1925	[25]	Pageant on the Vltava River	37.97"	1928	Str.Q.#2 (Intimate Letters) III
1928	[44]	The Slav Epic	41.57"	1928	Str.Q.#2 (Intimate Letters) IV

Barlow's Harmonicity Formulæ

Indigestibility

$$\xi(N) = 2\sum_{r=1}^{\infty}\left(\frac{n_r(p_r-1)^2}{p_r}\right)$$

whereby:

1. $N = \prod_{r=1}^{\infty} p_r^{n_r}$
2. $N,\ n,\ p \in$ natural numbers
3. $p \in$ prime numbers

Harmonicity

$$H(P,Q) = \frac{\operatorname{sgn}\left(\xi(Q)-\xi(P)\right)}{\xi(P)+\xi(Q)}$$

whereby $\operatorname{sgn}(x)=-1$ for $x<0$,
else $\operatorname{sgn}(x)=+1$

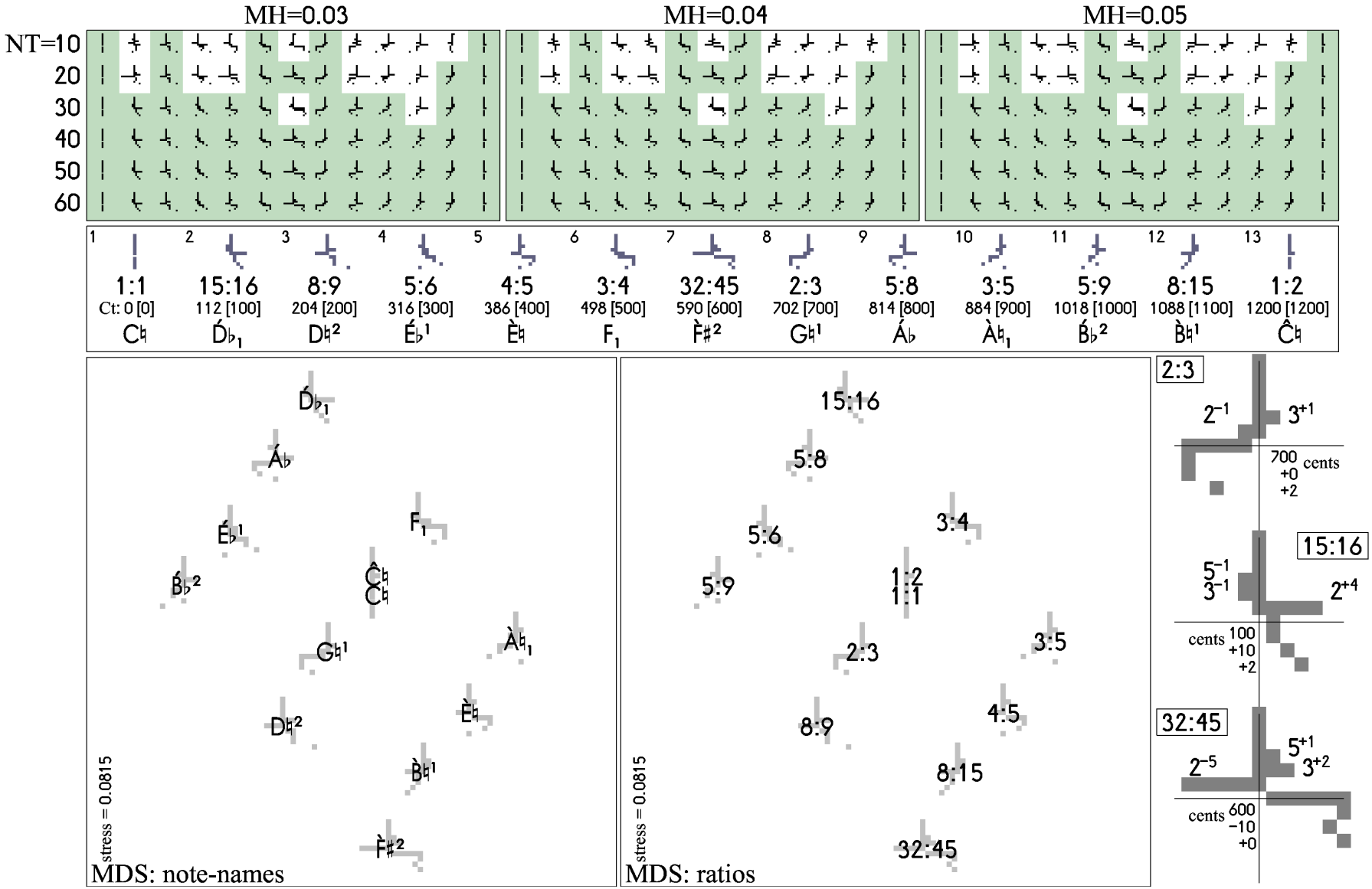
Indigestibility ξ of the natural numbers 1-16

N	ξ (N)
1	0.000000
2	1.000000
3	2.666667
4	2.000000
5	6.400000
6	3.666667
7	10.285714
8	3.000000
9	5.333333
10	7.400000
11	18.181818
12	4.666667
13	22.153846
14	11.285714
15	9.066667
16	4.000000

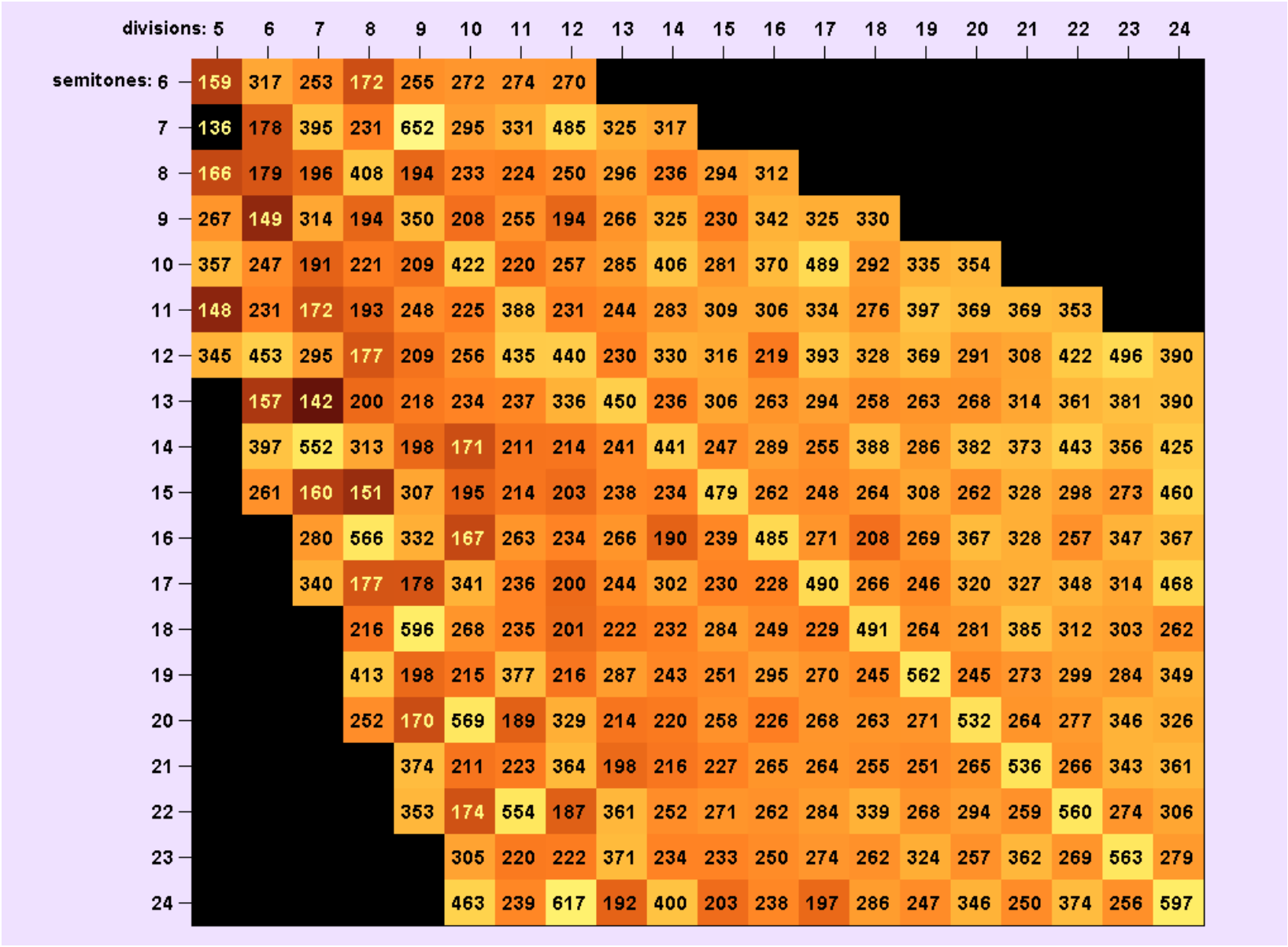
Complete Intraoctavic Intervals upwards of Harmonicity 0.05

Interval size (cts)	Prime Decomposition as Powers of 2	3	5	7	11	13	Number-ratio	Harmonicity
0.000	0	0	0	0	0	0	1:1	+∞
70.672	−3	−1	+2	0	0	0	24:25	+0.054152
111.731	+4	−1	−1	0	0	0	15:16	−0.076531
182.404	+1	−2	+1	0	0	0	9:10	+0.078534
203.910	−3	+2	0	0	0	0	8:9	+0.120000
231.174	+3	0	0	−1	0	0	7:8	−0.075269
266.871	−1	−1	0	+1	0	0	6:7	+0.071672
294.135	+5	−3	0	0	0	0	27:32	−0.076923
315.641	+1	+1	−1	0	0	0	5:6	−0.099338
386.314	−2	0	+1	0	0	0	4:5	+0.119048
407.820	−6	+4	0	0	0	0	64:81	+0.060000
427.373	+5	0	−2	0	0	0	25:32	−0.056180
435.084	0	+2	0	−1	0	0	7:9	−0.064024
470.781	−4	+1	0	+1	0	0	16:21	+0.058989
498.045	+2	−1	0	0	0	0	3:4	−0.214286
519.551	−2	+3	−1	0	0	0	20:27	−0.060976
568.717	−1	−2	+2	0	0	0	18:25	+0.052265
582.512	0	0	−1	+1	0	0	5:7	+0.059932
590.224	−5	+2	+1	0	0	0	32:45	+0.059761
609.776	+6	−2	−1	0	0	0	45:64	−0.056391
617.488	+1	0	+1	−1	0	0	7:10	−0.056543
680.449	+3	−3	+1	0	0	0	27:40	+0.057471
701.955	−1	+1	0	0	0	0	2:3	+0.272727
729.219	+5	−1	0	−1	0	0	21:32	−0.055703
764.916	+1	−2	0	+1	0	0	9:14	+0.060172
772.627	−4	0	+2	0	0	0	16:25	+0.059524
792.180	+7	−4	0	0	0	0	81:128	−0.056604
813.686	+3	0	−1	0	0	0	5:8	−0.106383
884.359	0	−1	+1	0	0	0	3:5	+0.110294
905.865	−4	+3	0	0	0	0	16:27	+0.083333
933.129	+2	+1	0	−1	0	0	7:12	−0.066879
968.826	−2	0	0	+1	0	0	4:7	+0.081395
996.090	+4	−2	0	0	0	0	9:16	−0.107143
1017.596	0	+2	−1	0	0	0	5:9	−0.085227
1088.269	−3	+1	+1	0	0	0	8:15	+0.082873
1129.328	+4	+1	−2	0	0	0	25:48	−0.051370
1137.039	−1	+3	0	−1	0	0	14:27	−0.051852
1200.000	+1	0	0	0	0	0	1:2	+1.000000

Rationalization of the Chromatic Scale



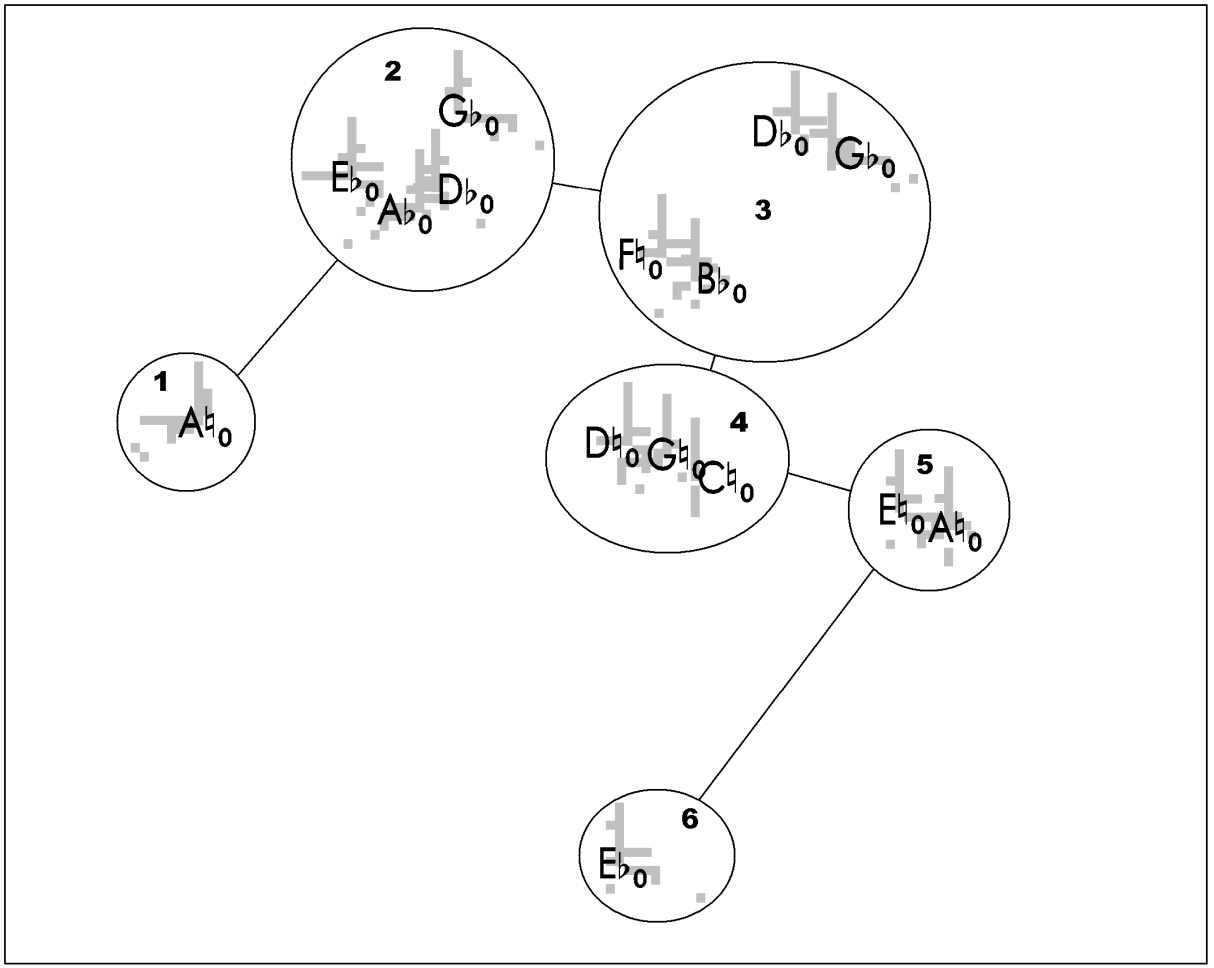
“Cogency” of Temperaments



semitones:	divisions: 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
6	159	317	253	172	255	272	274	270												
7	136	178	395	231	652	295	331	485	325	317										
8	166	179	196	408	194	233	224	250	296	236	294	312								
9	267	149	314	194	350	208	255	194	266	325	230	342	325	330						
10	357	247	191	221	209	422	220	257	285	406	281	370	489	292	335	354				
11	148	231	172	193	248	225	388	231	244	283	309	306	334	276	397	369	369	353		
12	345	453	295	177	209	256	435	440	230	330	316	219	393	328	369	291	308	422	496	390
13		157	142	200	218	234	237	336	450	236	306	263	294	258	263	268	314	361	381	390
14		397	552	313	198	171	211	214	241	441	247	289	255	388	286	382	373	443	356	425
15		261	160	151	307	195	214	203	238	234	479	262	248	264	308	262	328	298	273	460
16			280	566	332	167	263	234	266	190	239	485	271	208	269	367	328	257	347	367
17			340	177	178	341	236	200	244	302	230	228	490	266	246	320	327	348	314	468
18				216	596	268	235	201	222	232	284	249	229	491	264	281	385	312	303	262
19				413	198	215	377	216	287	243	251	295	270	245	562	245	273	299	284	349
20				252	170	569	189	329	214	220	258	226	268	263	271	532	264	277	346	326
21					374	211	223	364	198	216	227	265	264	255	251	265	536	266	343	361
22					353	174	554	187	361	252	271	262	284	339	268	294	259	560	274	306
23						305	220	222	371	234	233	250	274	262	324	257	362	269	563	279
24						463	239	617	192	400	203	238	197	286	247	346	250	374	256	597

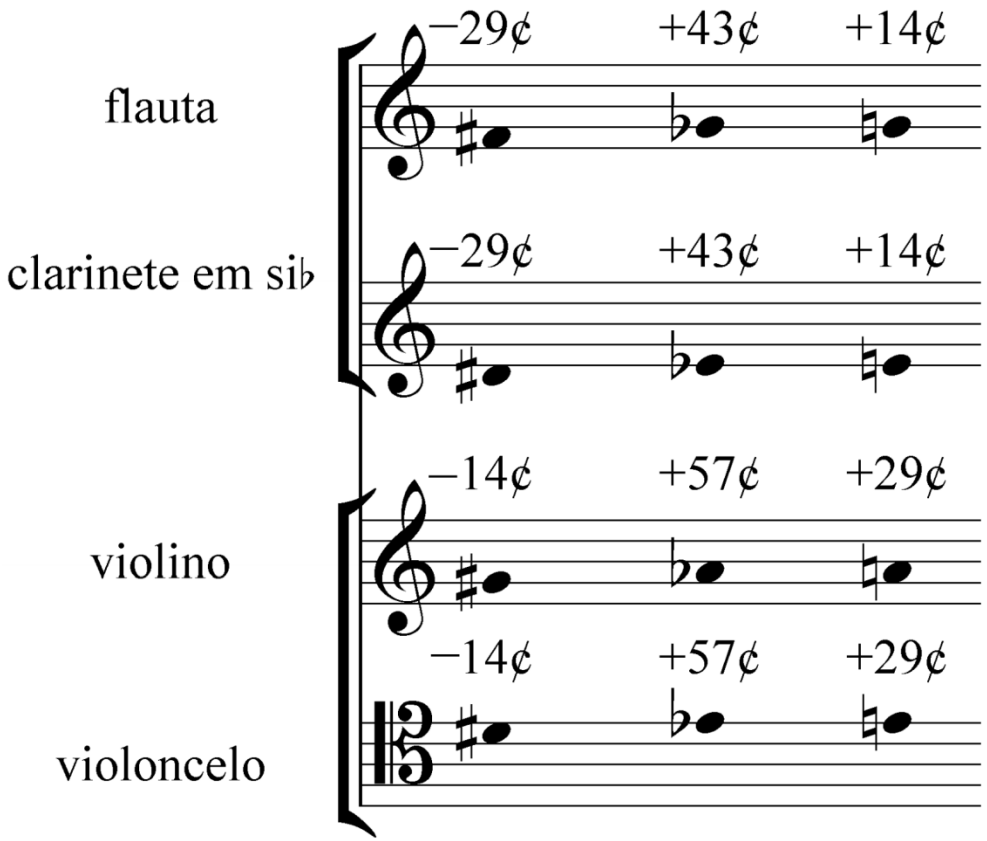
Rationalization of m7/14 scale

	1:1	20:21	25:27	8:9	160:189	22:27	7:9	20:27	5:7	25:36	2:3	40:63	64:105	7:12	5:9
cents	0	84	133	204	288	355	435	520	583	631	702	786	857	933	1018
	[0]	[71]	[143]	[214]	[286]	[357]	[429]	[500]	[571]	[643]	[714]	[786]	[857]	[929]	[1000]
	0	+13	−10	−10	+2	−2	+6	+20	+12	−12	−12	0	0	+4	+18
	C♮0	D♭0	D♭0	D♮0	E♭0	E♭0	E♮0	F♮0	G♭0	G♭0	G♮0	A♭0	A♮0	A♮0	B♭0



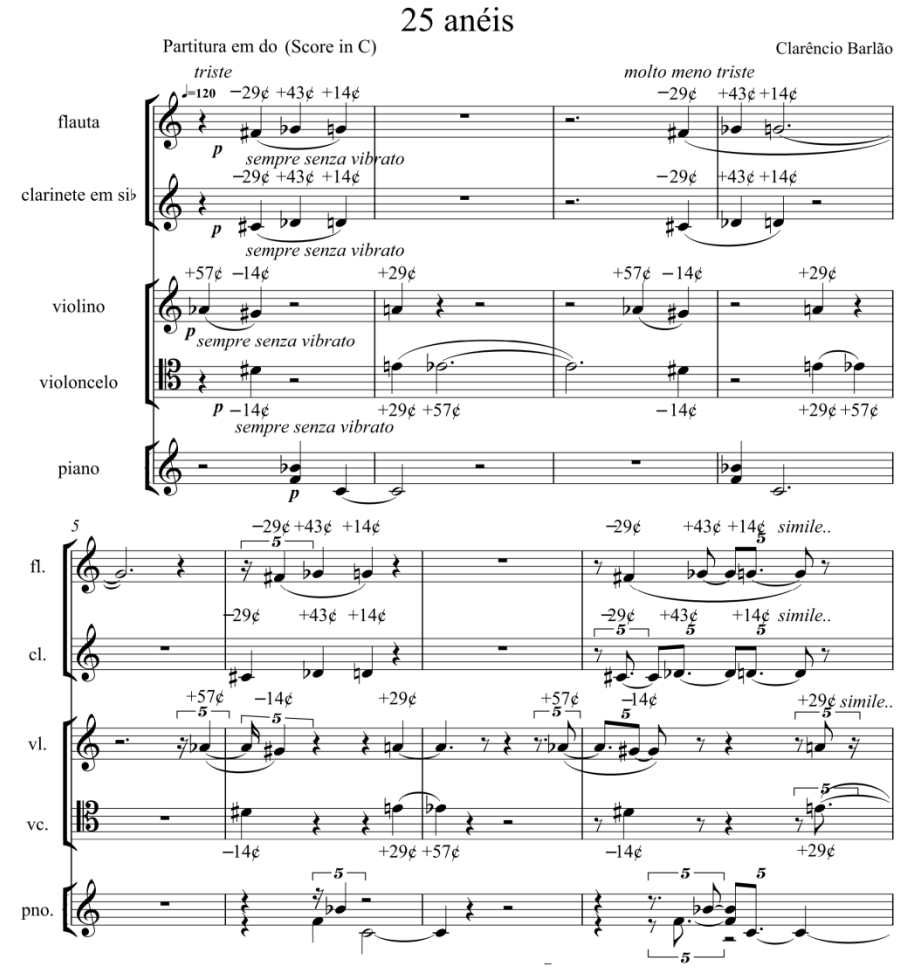
Tuning for *vinte e cinco anéis* (2010)

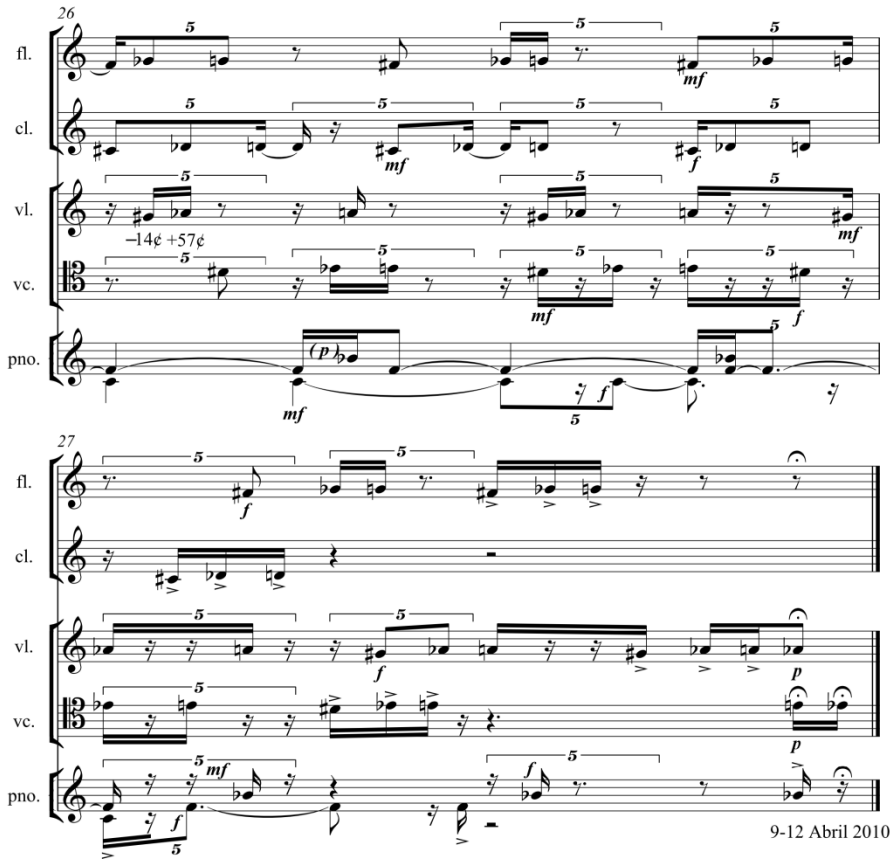
Cada instrumento repetidamente toca três notas. Excepto para o piano, as notas são microtonalmente afinadas como segue, mas nem sempre nesta ordem (¢ significa "cents"):*



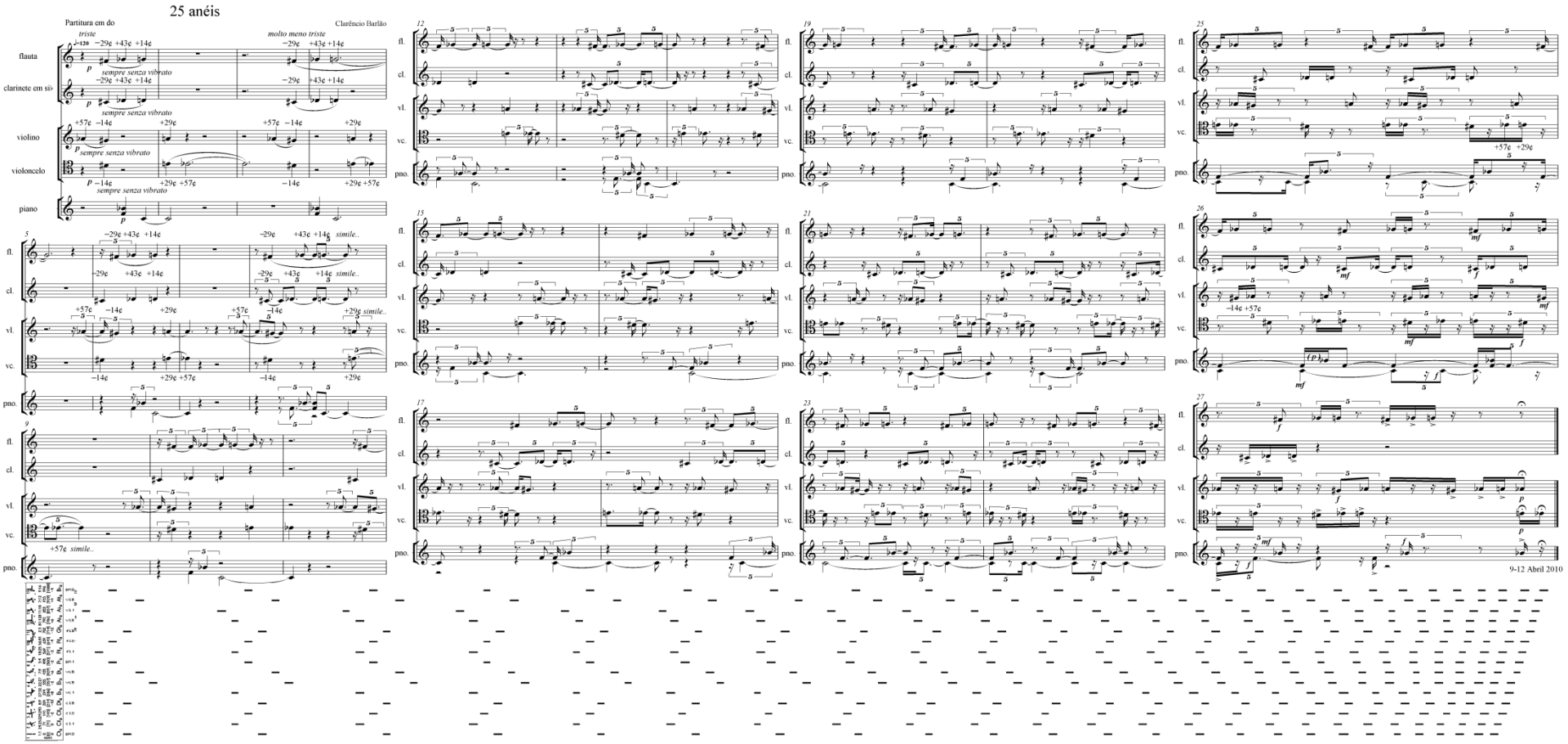
* Each instrument repeatedly plays three notes. Except for the piano, the notes are tuned microtonally as follows, but not always in the same order (¢ means "cents"):

vinte e cinco anéis: start and finish





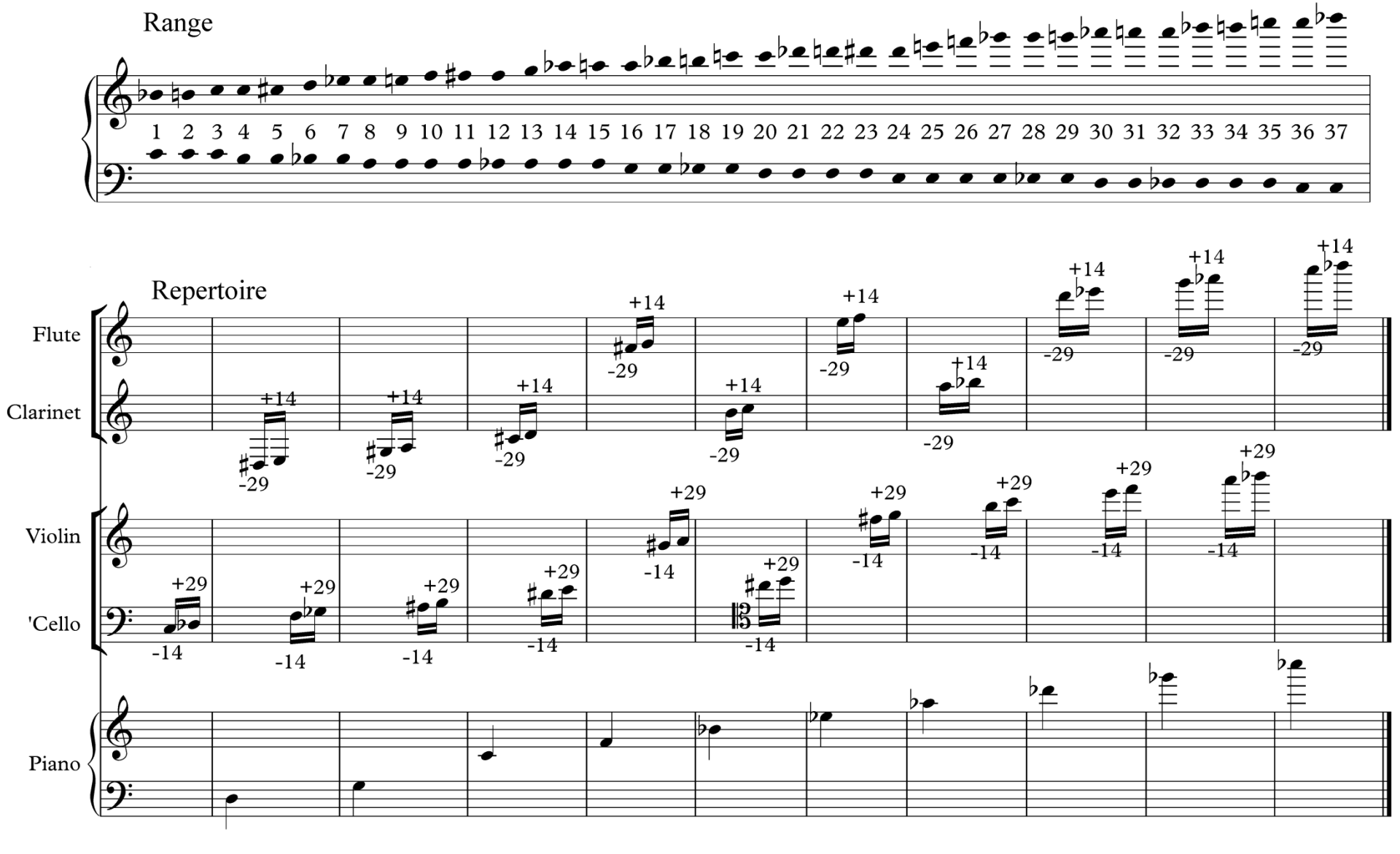
vinte e cinco anéis: score/graphic display



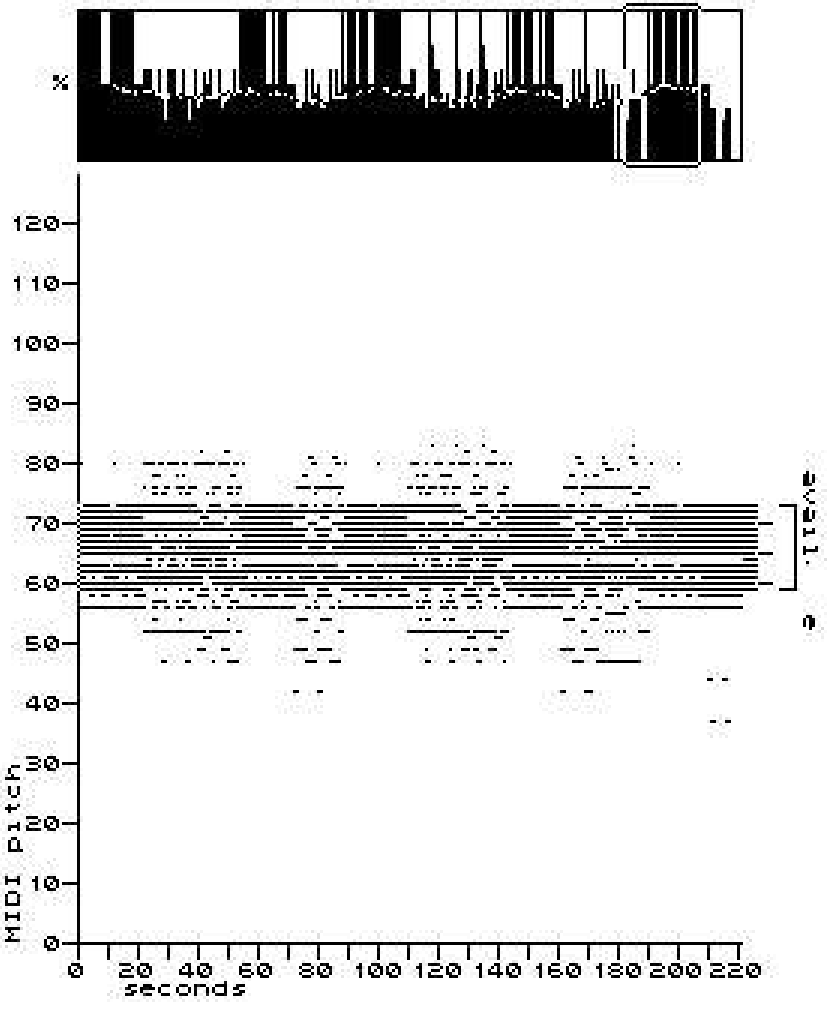
Re-use of *vinte e cinco anéis tuning*

cents	notes	frequency	instrument
0	C♮	264.484 Hz	piano
71	C♯-29¢	275.625 Hz	clar.
143	C♯+43¢	287.235 Hz	clar. → sine
214	D♮+14¢	299.334 Hz	clar.
286	E♭-14¢	311.942 Hz	cello
357	E♮-43¢	325.082 Hz	cello → sine
429	E♮+29¢	338.775 Hz	cello
500	F♮	353.044 Hz	piano
571	F♯-29¢	367.915 Hz	flute
643	F♯+43¢	383.412 Hz	flute → sine
714	G♮+14¢	399.562 Hz	flute
786	A♭-14¢	416.393 Hz	viol.
857	A♮-43¢	433.932 Hz	viol. → sine
929	A♮+29¢	452.210 Hz	viol.
1000	B♭	471.258 Hz	piano

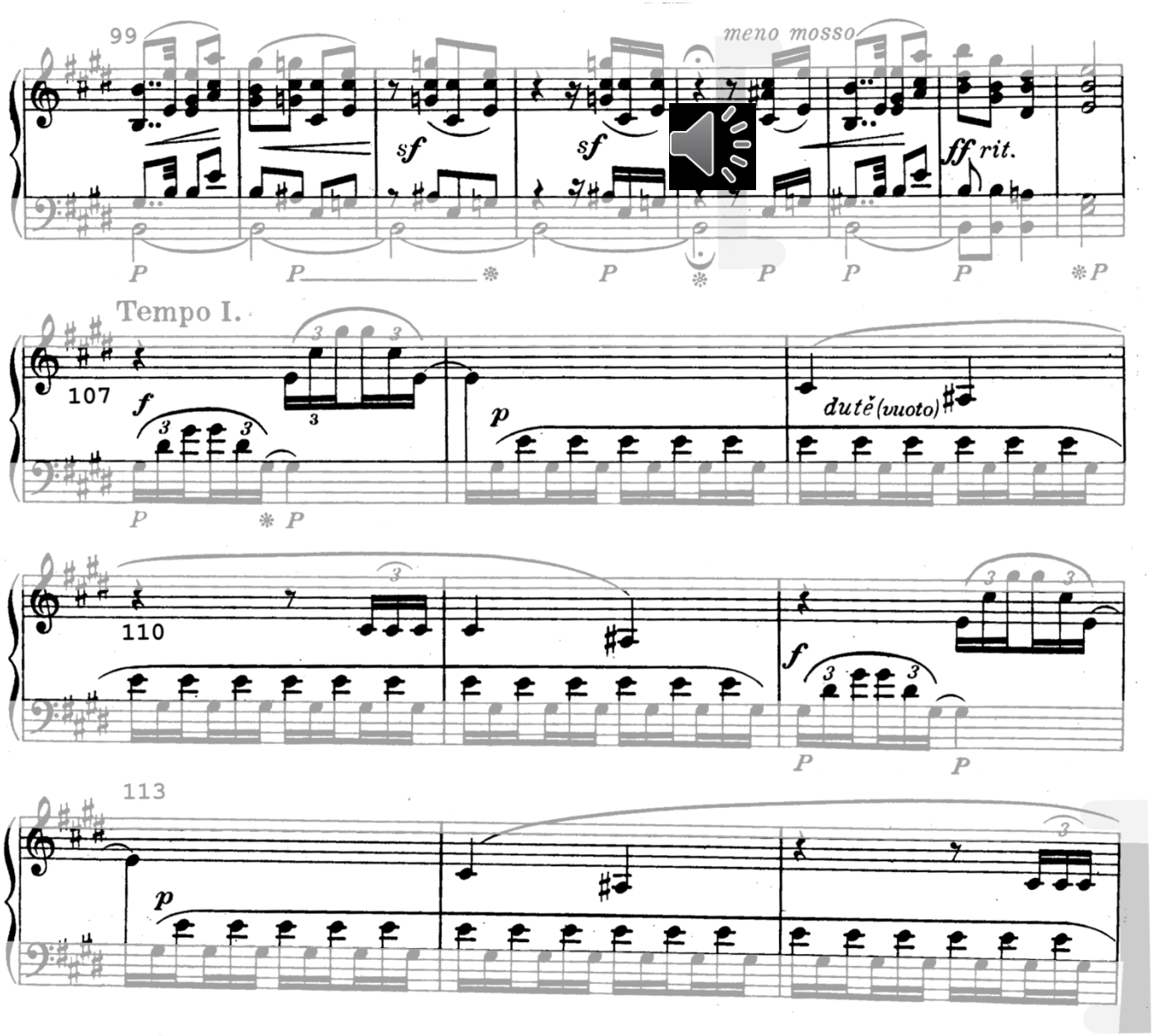
Extended *vinte e cinco anéis tuning*



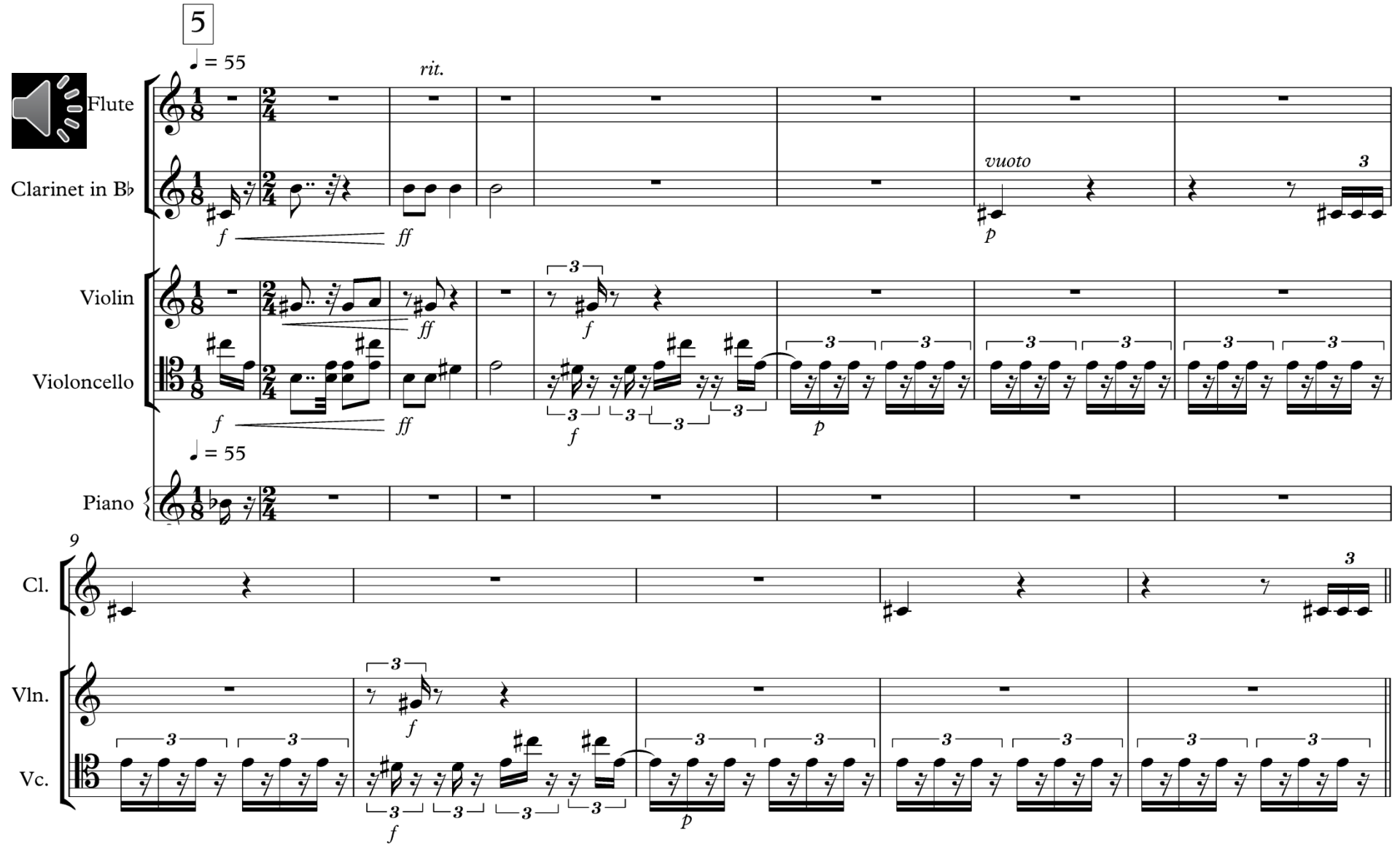
```
050VXPR.mdk:  3178 events read, ending at 221.157"; pitch range: 37-83.
   192 orchestrations listed  050VXX!.mdk being written:    173 events written.
   952 monochronous event blocks ("chords") found
best window: #2797/chd802 (182.946") ~ #3114/chd923 (207.072") @50%
```



Selection #5 from Janáček: *Barn Owl*

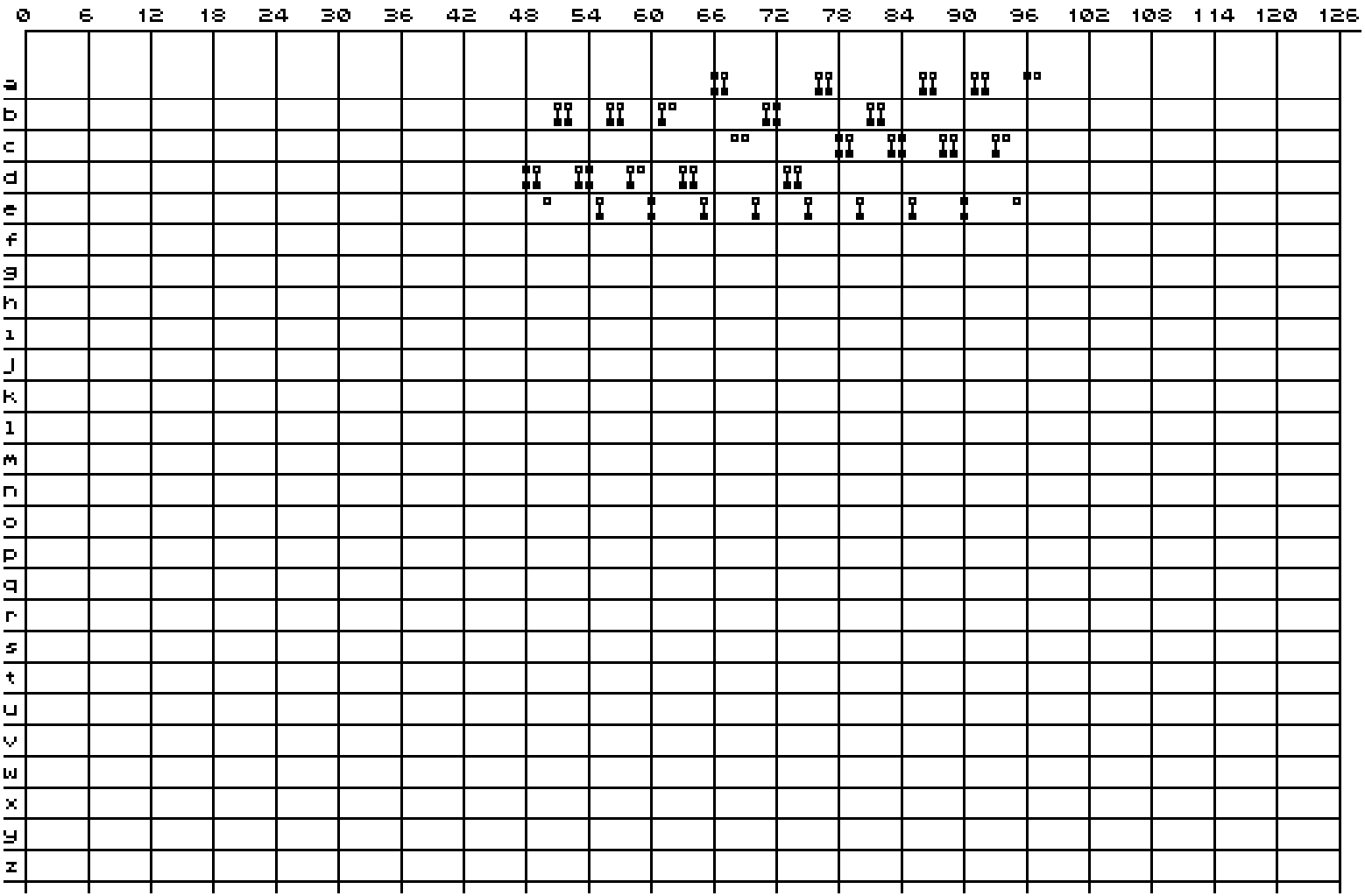


Reinstrumentated Selection #5



Error Check for Section #37

37Q24.mdk being read; 5 tracks found: abcde



37Q24.mdk: Pitches 48 (48*) ~ 93 (97*). Length 41.72" (41.6"*) *prescribed

Mucha Selection #31 – first frame

Mucha Selection #31 – middle frame

Mucha Selection #31 – final frame

St. Thomas' Abbey, Brno: title frame