Latent Possibilities: Asciano Mayone's Thirty-one Tone Examples

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Amidst the flurry of musical experimentation in the late Renaissance and early Baroque, one less traveled path of exploration was that of tonal systems with more than twelve notes. Some built special harpsichords and organs, typically with 19 and 31 keys to the octave[1] . These instruments brought some positive acclaim; the virtuoso Luzzaschi (1545?-1607) impressed many with his performances on Vicentino's *archicembalo*[2] . However, hardly any compositions written specifically for the many-keyed instruments survive. Even for the slightly more common *cimbalo cromatico*, it is clear that music was specifically written for it but deliberately made playable on simpler instruments[3] . The examples written by Asciano Mayone (c1565-1627) for Fabio Colonna's *Sambuca lincea* happen to be some of the only surviving music written for a 31-tone instrument. We look to Mayone's examples for a glimpse of how, if it were more practically feasible, such a microtonal system might have enhanced the expressive universe of early Baroque music (and all of the music to follow).

Books I and II of *Sambuca Lincea* describe Colonna's *sambuca*, a harpsichord with six rows of keys. They also explain how Colonna arrives at his tuning system of 31 theoretically equally-spaced intervals within the octave[4] . Thirty-one tone equal temperament is essentially an extension of 1/4-comma meantone, which features just (386 cent) major thirds the expense of perfect fifths (5.4 cents flat of a just 3/2). Extended meantone offered the best of two worlds: sweet thirds and sixths for contemporary harmonies and the ability to play all of the ancient

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[1] For historical records of 19-tone instruments see Christopher Stembridge, "The Cimbalo Cromatico and Other Italian Keyboard Instruments with Nineteen or More Divisions to the Octave (Surviving Specimens and Documentary Evidence," Performance Practice Review vi/1 (1993) 33-59.

[2] Edmond Strainchamps, "Luzzasco, Luzzaschi," New Grove Dictionary of Music and Musicians [online]; www.grove.com, accessed 11/4/04.

[3] Christopher Stembridge, "Music for the Cimbalo Cromatico and Other Split-keyed Instruments in Seventeenth-Century Italy," Performance Practice Review v (1992), 5-43, see pp. 10-16.

[4] Fabio Colonna, *La Sambuca Lincea: Overo Dell'istromento Musico Perfetto*, ed. Patrizio Barbieri (Lucca: Libreria Musicale Italiana, 1991), 1-68.

Greek genera. In recent times, 31-equal has been shown to have an overall "mood" or "sound" that can only be explored by looking at the exact intervals that it offers[5] ; these will be dealt with as they arise in the examples.

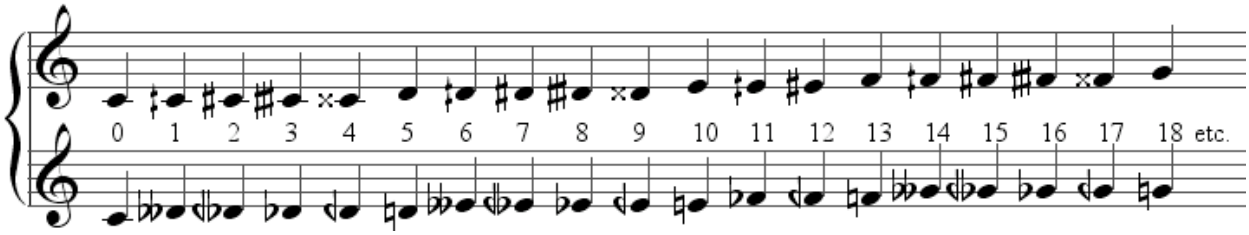

Figure 1 - 31 tone equal temperament notation and enharmonics (through the perfect fifth)

Figure 1 shows the notation that will be used here. Since the whole tone is divided into five parts, there are two sizes of semitone, the diatonic (e.g. E-F) and the chromatic (e.g. E flat-E).

The longest example by far is the *Esempio della circolatione* or "example of circulation."[6] It begins in G major and travels up by fourths through the entire 31-note circle before ending in C major. The musical material is scarcely varied; each key lasts one and a half measures and uses the same contrapuntal lines as the first measure and a half. However, Mayone was able to ease the rhythmic tedium somewhat by lengthening two key centers by a beat: D flat in mm. 10-11 and D semi-sharp/E double-flat in mm. 18-20. Mayone also eases the harmonic tedium of the same cadence over and over again by using a minor variant of it. The minor version is used four consecutive times beginning in measure 14 (as indicated by an A double-flat in the alto voice, which is a flatted sixth above the bass's C flat). It returns again near the end as the bass moves from B to E. In all cases the minor cadence becomes major before moving on so that the leading tone is always present.

Although the circulation example employs all 31 notes, it stays well within mainstream diatonic harmony. Consequently, nearly all of the melodic semitones are of the larger, diatonic

[5] Ivor Darreg, "New Moods," *Interval* Spring (1978): 3.

[6] Fabio Colonna, *La Sambuca Lincea: Overo Dell'istromento Musico Perfetto*, ed. Patrizio Barbieri (Lucca: Libreria Musicale Italiana, 1991), LVII-LXII.

variety, which may sound jarringly large to unaccustomed ears. One may similarly find the major thirds too small and the minor thirds too large, but the perfect fifth, in the author's opinion, is not so far off as to even attract attention much of the time.

The thirty-one system offers two versions of the enharmonic mode, termed *molle* ("soft") and *intenso* ("sharp"). Both feature a melodic step of a major third but divide up the remaining diatonic semitone in two different ways:

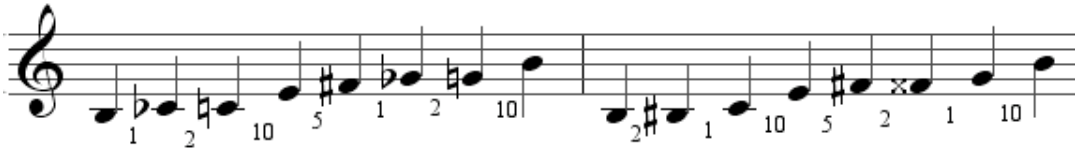

Figure 2 - Soft and sharp enharmonic as in *Sambuca lincea* (numbers indicate number of 31-ET steps)

Mayone's examples in the enharmonic modes are of much interest because enharmonic counterpoint "was indeed considered impossible by almost all the treatise writers."[7] In the first (p.92), the soprano line is simply the ascending soft enharmonic octochord (two tetrachords separated by a whole tone, as in Figure 2). The microtones always occur quickly and function as passing tones. The resulting brief sonority is the diminished fourth, which in 31-ET is very close to the just ratio 9/7 (435 cents)[8] .

Mayone offers a point of imitation on "Kyrie eleison" fitted to the notes of the soft enharmonic tetrachord[9] . The treatment of the microtones here is slightly different: often a second line a third or a sixth above the voice with the motive will move in parallel with that voice. Two voices moving parallel by such small intervals tends to break down the sense of a tonal anchor, at least temporarily.

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[7] ibid. LI.

[8] 1200*log base 2(9/7) ≈435.

[9] ibid. 93.

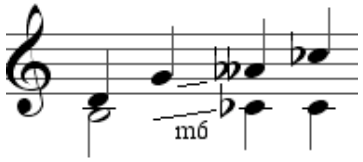

Figure 3 - measure 3 of *enarmonico molle osseruato in fuga da quattro parti*

Mayone provides a similar example in the sharp enharmonic[10] . The temporary sense of being in a parallel tonality is even stronger in mm. 4-5 as an entire major triad is shifted by a fifth-tone. In mm. 6-7, for reasons unclear, Mayone leaves the soprano's D sharp unresolved, jumping down to a C instead.

There are yet more examples using only the soft and sharp chromatic modes. As in the enharmonic, the difference is in the ordering of the smaller intervals, and first note of the sharp mode is one fifth-tone higher than the first note of the soft mode. Both intervals are found in twelve-note quarter-comma meantone, and the inequality of semitones is as striking here as in meantone. On Colonna's *Sambuca*, however, they are not confined to a few particular places, and Mayone exploits this freedom. For example, in the example titled *Chromatico Intenso à quattro parti*[11], one finds both G sharp (in harmony with B, m.3) and A flat (in harmony with C, m.8).

Another point of interest in this example is the use of a symmetrical motive, exemplified by {A C C-sharp E}. Two minor thirds are separated by a chromatic semitone, making for a sound that is not characteristically "sharp" or "soft" yet still very distinct.

Mayone's examples that mix the genera freely show great promise. Colonna explains before the example with the lyric "Stabat mater" that the composition mixes all three genera[12], it is a very subtle mix. The enharmonic is hinted at in m. 8 in the alto voice (Figure 4a).

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[10] ibid. LXIII.

[11] ibid. 95-96.

[12] ibid. 98.

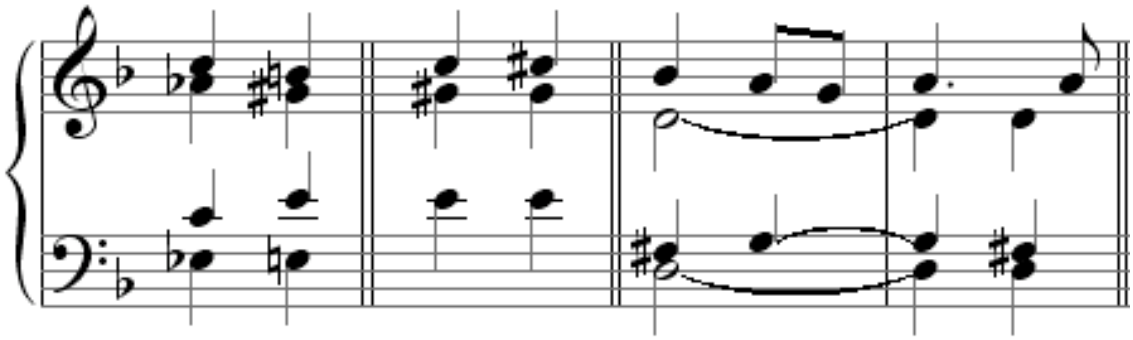

Figure 4 - *I tre generi misti* a)m.8, b)m.2, c)mm.12-13

Even this fleeting moment of enharmonicism is noticeable. Also reminiscent of the enharmonic are two particularly striking moments, the first beat of m.8 and the first beat of m.12 (Figure 4b, 4c). Both are examples of a diminished fourth on top of a major third; the result is a very grating relative to the augmented triad. Their place on the strong beat of each measure makes it stick out all the more. This interval also appears melodically in the soprano in measure 9.

Figure 5 shows the beginning of an example entitled "Diatonic harmony on the enharmonic keys"[13] — this is mostly diatonic but in a remote key that would sound harsh on an instrument with only eleven suitable fifths (as meantone typically does). Figure 6 is a similar example that also happens to highlight differences between the chromatic and diatonic semitones as well as the fifth-tone.

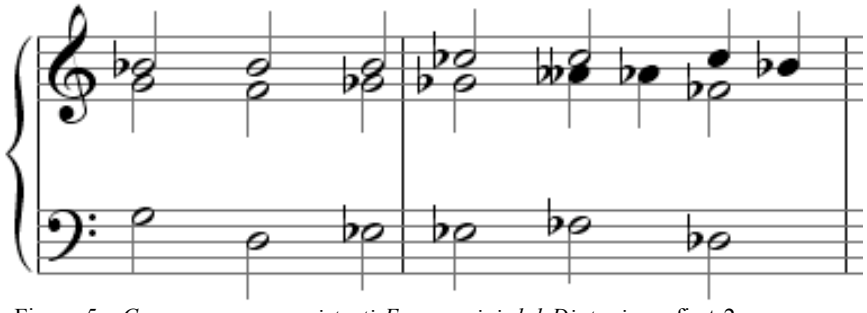

Figure 5 - *Consonanze sopra i tasti Euarmonini dal Diatonico* - first 2 measures

[13] "*Consonanze sopra i tasti Euarmonini dal Diatonico"* — ibid. 100.

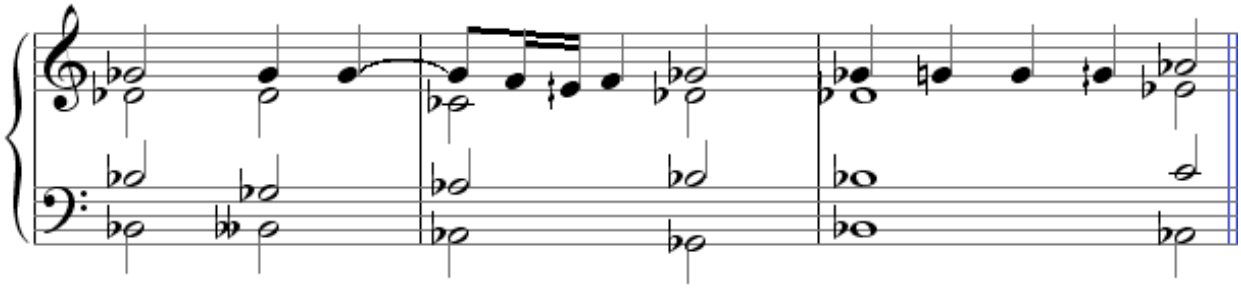

Figure 6 - *Altre Consonanze sopra l'Enarmonico*[14]

Another device evident to Colonna is the *strisciata di voce* or "sliding voice" — upward melodic movement through consecutive fifth-tones as a "melodic ornament."[15] The example Mayone wrote is not particularly convincing of its usefulness, and perhaps one reason is that th slide is not complete as he writes it; there is still a jump of two fifth-tones at each resolution (see Figure X).

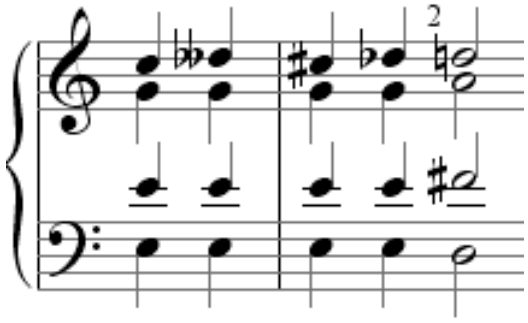

Figure X - Final cadence of *strasciata di voce* example

It is clear that a 31-tone system offers a wide array of subtle effects that could enhance any style of music. Most notably the resources of the enharmonic modes could have greatly enriched the harmonic language available to the many adventurous keyboard compsers in the Baroque. It is doubtful, however, that singers and string players could have learned to navigate the intricacies of the 31-tone system without the aid of keyboards that were simply too uncommon and too difficult to maintain. Now, with the technological impediment all but gone, composers today would do well to at least try the system in which Mayone's example compositions merely scratched the surface.

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[14] ibid. 101.
[15] ibid. LI.

CD Tracks:

1. *Esempio della circolatione*

2. Soft enharmonic 1

3. Soft enharmonic 2

4. Sharp enharmonic

5. Soft chromatic

6. Sharp chromatic 1

7. Sharp chromatic 2

8. *Consonanze sopra i tasti Euarmonini dal Diatonico*

9. *Stabat mater (I tre generi misti)*

10. *Altre Consonanze sopra l'Enarmonico*

11. *Strisciata di voce*

These were made using a QS8 synthesizer being retuned live by Scala

<www.xs4all.nl/~huygensf/scala/>

Bibliography

Barbour, James Murray. *Tuning and temperament, a historical survey*. East Lansing: Michigan State College Press, 1951.

Barbieri, Patrizio. "*La sambuca lincea* di Fabio Colonna e il *tricembalo* di Scipione Stella. Con notizie sugli strumenti enarmonici del Domenichino." *La musica a Napoli durante il Seicento*, ed. D. A. D'Alessandro and A. Ziino, 167-216. Rome: Torre d'Orfeo, 1987.

Colonna, Fabio. *Sambuca lincea: overo dell'instrumento musico perfetto.* Ed. Patrizio Barbieri. Lucca: Libreria Musicale Italiana, 1991.

Isacoff, Stuart. *Temperament: The Idea That Solved Music's Greatest Riddle.* New York: Alfred A. Knopf, 2001.

Martin, L.W. "The Colonna-Stella *sambuca lincea*, an Enharmonic Keyboard Instrument." *Journal of the American Musical Instrument Society* (1984): 5–21.

Stembridge, Christopher. "Music for the *Cimbalo Cromatico* and other Split-Keyed Instruments in Seventeenth-Century Italy." *Performance Practice Review* 5 (1992): 5-43.

Vicentino, Nicola. *Ancient Music Adapted to Modern Practice.* Translated with introduction and notes by Maria Rika Maniates. Ed. Claude V. Palisca. New Haven: Yale University Press, 1996.