

Early Developments of Harmonic Theory in the New World: Reflections
on Two 17th-Century Mexican Treatises

by Carlos A. Flores

Department of Music, Andrews University

The study of music theory in the New World began with the arrival of Spanish musicians and teachers on American soil. As expected, a notable Spanish influence took place during the colonial era, dominating almost every aspect of cultural life. However, the residents of the New World soon became aware of the convenience of establishing their own tradition: they began to build their own cathedrals and, not satisfied with the music literature that was imported from Europe, they composed their own music and published their own books. Furthermore, they were also preoccupied with the technical aspects of music as well as with the theoretical problems involved in explaining it. It can be assuredly stated that several theoretical books were written in Mexico during the seventeenth or even as early as the sixteenth century. Historical references, as well as personal testimonies of some who claimed to have seen some of these early treatises, attest to their existence. One such testimony is given by the Mexican musicologist Guillermo Orta Velázquez:

There is evidence for the existence of many manuscript methods (written in Mexico), whose pedagogical and formative value must not be judged according to their content, but rather, according to their usefulness in music instruction. For our own satisfaction,

we have had in our hands some of these rare copies which denote accuracy in their precepts, according to the musical theory of the time.¹

The first historical reference with regard to a theoretical treatise written in Mexico is perhaps the one given by the chronicler Fray Francisco de Burgoa (1604-1681). In his *Geográfica descripción*,² Burgoa talks about one Indian, Juan Matías (ca. 1617-1667), native of San Bartolomé (called Zaapeche in Indian dialect), a town in the state of Oaxaca well known for having several fine ecclesiastical musicians.³ Burgoa's report narrates that Matías was such an extraordinary musician that, when he was only twenty years of age, a Spanish chapelmaster decided to take him to Spain to present him before the king. Unfortunately, the ship on which he was to make the journey did not sail that year and Matías had to return home. Almost immediately afterward, he was appointed chapelmaster at the Oaxaca Cathedral, selected over several eminent musicians from Mexico City and Puebla. Matías remained in that position for fifteen years, during which he achieved great recognition as a composer. He was a prolific composer of liturgical music such as: Kyries, Glorias, Credos, and music for vespers and other offices. Among his best works are a *Stabat Mater* and a sacramental villancico entitled *Ocho al Santísimo*. His secular compositions include villancicos and canzonetas which are widely used by the natives in their celebrations. As a performer he is said to have been able to play anything from the organ to the smallest instrument as if he was dedicated to such one instrument alone.⁴

In the index to his work, Burgoa makes reference to a theoretical treatise by Matías in which he "reduced harmony to a perfect circle."⁵ This book by Matías is probably the first of its kind written not only in Mexico but probably in the New World.⁶ Unfortunately, it has

been lost and every attempt to locate it has, so far, been unsuccessful. Nevertheless, it seems important to consider what Burgoa meant when he attributed to Matías the achievement of having “reduced harmony to a perfect circle.”

We can perhaps explain this fact by answering two fundamental questions: 1) what did Burgoa (and Matías, for that matter) understand by the term “harmony”? and, 2) how could Matías have reduced such concept of harmony to a perfect circle? With regard to the first question, let us consider a couple of definitions of the term “harmony” previous to Matías’ time. About one hundred years earlier, Zarlino defined harmony as: “nothing other than diversity of moving parts and consonances, brought together with variety.”⁷ As implied in this definition, Zarlino understood “harmony” to be the sounding together of several parts or voices. He further clarifies his concepts when he speaks of “proper” and “improper” harmony. After giving some consideration to compositions using dissonances in counterpoint and compositions for two voices alone, Zarlino makes the following statement:

In neither case will what we call proper harmony be achieved. That is, we do not hear the full body of consonance and harmony whose extreme sounds are divided by intermediate sounds. Instead, we hear what we call improper harmony, consisting of two voices only, without intermediate sounds.⁸

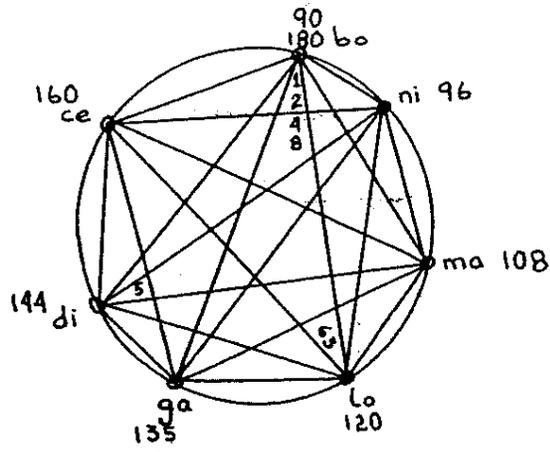
Evidently, for Zarlino, more than two sounds are required to achieve “proper harmony.” Zarlino is one of the earliest theorists to recognize the triad and to classify it into major and minor.⁹ During the first part of the seventeenth century, several German theorists further defined the concept of harmony. For them the triad played a more important role in

the theory of harmony than it did for Zarlino. For Johannes Lippius (1585-1612), for instance, harmony was conceived fundamentally in terms of the triad:

The harmonic, simple and direct triad is the true and unisonic root of all the most perfect and most complete harmonies that can exist in the world. It is the root of even thousands and millions of sounds, because each of them should ultimately be reducible to the parts of the triad, either by unison or by octave. The triad is the image of that great mystery, the divine and solely adorable Unitrinity (I cannot think of a semblance more lucid).¹⁰

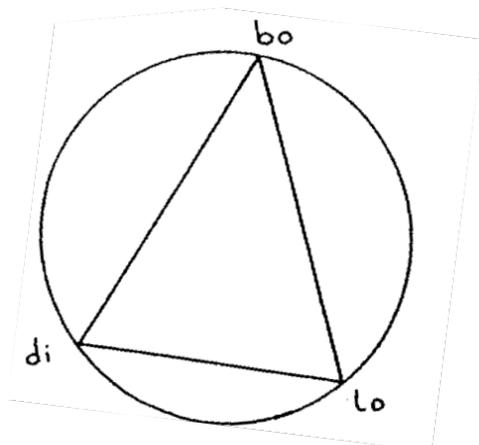
Therefore, it is clear that, by Matías' time, harmony was defined (at least in Europe) in terms of triads. Even Spanish theorists talked about harmony in this respect. For example, as early as 1565, Thomás de Sancta María, perhaps influenced by the instrumental practice of his day, talked about chords and stated that all chordal combinations were to be computed from the bass to the soprano, since the inner voices "serve merely as accompaniment to fill the gap between the outer voices."¹¹ Assuming that Matías was familiar with such newer theory of harmony, just how could he have reduced that concept of harmony to a "perfect circle"? It has been shown that the geometrical figure of the circle was used before Matías' time, especially by German theorists early in the seventeenth century. The concept of a "circular scale" was introduced by Burmeister and Putaneus and further developed by Lippius.¹² By means of the following figure (Example 1) Lippius illustrated his concept of the "circular scale" which he used specifically to prove the invertibility of intervals.¹³

Example 1. Lippius' illustration of the "circular scale."



However, Lippius also used the circle in reference to the harmonic triad. He made reference to a "triangle of the circular scale" (*Triangulus scalae circularis*) to illustrate the perfection of the triad. Rivera has shown (see Example 2) how Lippius obtained a circular triangle from the above figure.¹⁴

Example 2. Lippius' *Triangulus scalae circularis*



According to Rivera: “this picture illustrates how the triad retains its identity after diffusion, inversion, or enlargement. In every arrangement it remains contained in one and the same circle-triangle.”¹⁵

Through the above illustrations one can see how the circle had been used to explain the invertibility of intervals and the harmonic triad. One could even say that Lippius “reduced the triad to a perfect circle.” However, it is doubtful that Matías’ achievement (that of reducing harmony to a “perfect circle,” as quoted by Burgoa) was in any way compatible with the above-mentioned German theories. I would like to suggest that the concept of “harmony,” as understood by Matias, was not necessarily the same as the one already discussed in reference to the German theorists. For the time being, and due to lack of information on the content of Matías’ treatise, one can only speculate about its possible implications and achievements. However, certain references to another Mexican treatise, supposedly written only a few years after the one by Matías, may shed some light on the subject and help us to understand what seventeenth-century Mexican writers meant when they speak about harmony.

According to several references, a musical treatise entitled *Compendio de armonía musical: El Caracol* was written during the second half of the seventeenth century by the famous Mexican poetess Sor Juana Inés de la Cruz (1651-1695).¹⁶ Furthermore, a reference by the writer herself, found in one of her poems, attests to the existence of such a treatise. General opinion, however, now concedes that Sor Juana’s treatise has been lost or destroyed. No one, to my knowledge has seen it in recent years. Orta-Velázquez believes that the treatise was based on the theory of Guido de Arezzo.¹⁷ Karl Vossler, on the other hand, announces an enlargement of harmonic theory.¹⁸ To what extent these opinions are valid is

uncertain. Furthermore, the merit of such work has also been evaluated by one of Sor Juana's biographers as follows: "This work, according to the authorities, was so highly praised, that by itself it would have been sufficient to make her world famous."¹⁹ Nevertheless, the best source of information about the content of the book is Sor Juana's own poem *Después de estimar mi amor*, written for the Excelentísima Señora Condesa de Paredes. In this poem, the author offers her apologies for the delay in sending a certain musical treatise the countess had requested from her. The reason for the delay, she explained, was that the book was not yet completely finished; she promised to conclude the work as soon as her health improved. The poem is reproduced in its entirety in Appendix A.

The poem begins with the customary salutation (lines 1-12)²⁰ after which Sor Juana makes reference to the musical treatise (lines 13-14). Then, in a marvelous display of poetry, she offers a summary of the elements of music, presumably those included in the treatise. She refers to the art of composition, its rules, characters, ciphers, proportions, quantities, intervals, dots, lines (lines 21-24), citing Pythagoras with regard to the divisions of the tone (lines 25-32). Following, she discusses whether the *diatessaron* should be considered a consonance (lines 33-36). Then she discusses several problems of notation in relation to *punto de alteración, máxima, longo, altera*, and *tripla* (lines 41-48), and talks about the imperfection that results when a given note is followed by another one of lesser value (lines 49-56). The term *tinta* (in lines 61-64) is probably used as synonymous with *coloration*, in reference to such notational practice. She further speaks about the perfection of the intervals of the octave and the fifth (lines 57-60), and also about the harmonic and arithmetic divisions of the octave (lines 65-68). Then she considers whether or not all music can be reduced to two mensurations: one for the voice and one for the time, and how these concepts apply to

plainchant (lines 69-80). From lines 81-88 she again touches upon the problems of tuning, and shows that the proportion from *ut* to *re* is not the same as from *re* to *mi*, and similarly the proportion from *fa* to *sol* is different from that of *sol* to *la*; this being, she explains, because *sesquioctava* and *sesquinona* are, although ever so slightly, nevertheless different. She then refers to the enharmonic and chromatic genera (lines 89-96). Finally, after a delightful interlude (lines 97-116 are purely poetic), she makes direct reference to her yet unfinished musical treatise from lines 117-140. The remainder of the poem is merely an elaborate farewell, without any significant references to music.

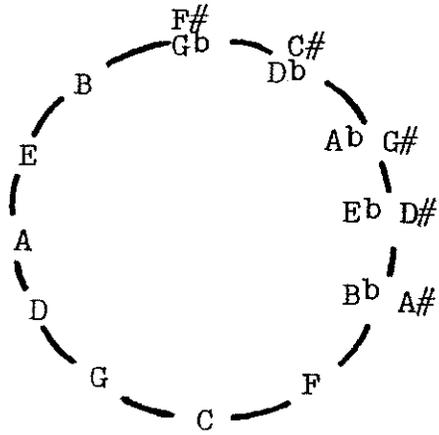
With regard to the treatise itself, the most revealing part of the poem is from lines 117-128. This section is reproduced here with English translation:

Y empecé a hacer un Tratado	I began to write a treatise
para ver si reducía	to see if I could reduce
a mayor facilidad	to greater facility
las reglas que andan escritas.	the rules that have been written.
En él, si mal no me acuerdo,	And if I remember well,
me parece que decía	it seems that I concluded
que es una línea espiral,	that harmony is not a circle,
no un círculo la Armonía;	but a spiral line;
Y por razón de su forma	And because of its shape
revuelta sobre sí misma,	revolving upon itself,
lo intitulé <u>Caracol</u> ,	I entitled it snail,
porque esa revuelta hacía.	Because of the turns it makes.

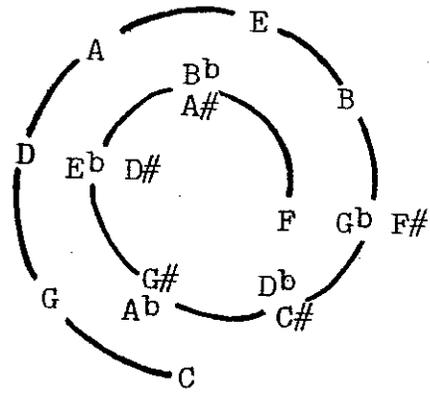
The above statement, in which Sor Juana claims to have reduced harmony to the form of a *spiral line* is certainly worthy of note. Moreover, it invites a comparison with Matías' previously discussed concept of the "perfect circle." That Sor Juana was well acquainted with the theory of the "perfect circle" is clearly stated in her poem (see lines seven and eight above). Perhaps she was also aware of Matías' theories (this can be inferred from line four above) and she was trying in this way to correct him.²¹ Before attempting to reconcile these two different ideas, we must first consider the two questions previously left unanswered, and direct them specifically to these two Mexican theorists: 1) What did Matías and Sor Juana understand by the term "harmony"? and, 2) How could one have reduced the same concept to a perfect circle while the other to a spiral line? The answer is found in Sor Juana's poem. Her evident preoccupation with proportions, comas, perfection of intervals, enharmonic equivalents, and her specific reference to Pythagoras, strongly suggest that her concept of harmony was based on the idea of a concordant relationship or ratios of tones; thus having more to do with tuning than with the European development of the harmonic triad. Matías reduced harmony to a "perfect circle" because he adopted equal-temperament; Sor Juana, on the other hand, reduced harmony to a "spiral line" because, as inferred in her poem, she used Pythagorean intonation. The corresponding figures in Example 3 give a visual representation of how each author might have illustrated their own concept.

Example 3.

Matias' Perfect Circle



Sor Juana's Spiral Line



APPENDIX A

POEM BY SOR JUANA INES DE LA CRUZ

Que escribe a la Excelentísima Señora condesa de Paredes, excusándose de enviar un Libro de Música; y muestra cuán eminente era en esta Arte, como lo prueba en las demás.

Después de estimar mi amor,
excelsa, bella María,
el que en la divina vuestra
conservéis memorias mías;

después de haber admirado
que, en vuestra soberanía,
no borrada, de mi amor,
se mantenga la noticia;

paso a daros la razón
10 que a no obedecer me obliga
vuestro precepto, si es que hay
para esto disculpa digna.

De la Música un Cuaderno
pedís, y es cosa precisa
que me haga a mí disonancia
que me pidáis armonías.

¿A mí, Señora, conciertos,
cuando yo en toda mi vida
no he hecho cosa que merezca
20 sonarme bien a mí misma?

¿Yo, arte de composiciones,
reglas, caracteres, cifras,
proporciones, cantidades,
intervalos, puntos, líneas,
quebrándome la cabeza
sobre cómo son las sismas,
si son cabales las comas,
en qué el tono se divide?

Si el semitono incantable
30 en número impar estriba,
a Pitágoras sobre esto
revolviendo las cenizas;
si el diatesarón ser debe
por consonancia tenida,
citando una Extravagante
en que el Papa Juan lo afirma;
si el temple en un instrumento,
al hacerlo, necesita

de hacer participación
40 de una coma que hay perdida;
 si el punto de alteración
a la segunda se inclina,
más porque ayude a la letra
que porque a las notas sirva;
 si el modo mayor perfecto
en la máxima consista,
y si el menor toca al longo;
cuál es áltera y cuál tripla;
 si la imperfección que causa
50 a una nota, otra más chica,
es total, o si es parcial,
esencial o advenediza;
 si la voz que, como vemos,
es cantidad sucesiva
valga sólo aquel respecto
con que una voz de otra dista;
 si el diapasón y el diapente
el ser perfectas, consista
en que ni menos ni más
60 su composición admita;

si la tinta es a las notas
quien todo el valor les quita,
siendo así que muchas hay
que les da valor la tinta;

lo que el Armónico medio
de sus dos extremos dista,
y del Geométrico en qué,
y Aritmético, distinga;

si a dos mensuras es toda
70 la Música reducida,
la una que mide la voz
y la otra que el tiempo mida;

si la que toca a la voz,
o ya intensa, o ya remisa,
subiendo o bajando, el Canto
Llano sólo la ejercita,

mas la exterior, que le toca
al tiempo en que es proferida,
mide el compás y a las notas
80 varios valores asigna;

si la proporción que hay
del Ut al Re no es la misma
que del Re al Mi, ni el Fa Sol

lo mismo que el Sol La dista;
que aunque es cantidad tan tenue
que apenas es percibida,
sesquiocava o sesquinona
son proporciones distintas;
si la Enarmónica ser
90 a práctica reducida
puede, o si se queda en ser
cognición intelectual;
si lo Cromático el nombre
de los colores reciba
de las teclas, o lo vario
de las voces añadidas;
y en fin, andar recogiendo
las inmensas baratijas
de calderones, güiones,
100 claves, reglas, puntos, cifras,
pide otra capacidad
mucho mayor que la mía,
que aspire en las Catedrales
a gobernar las Capillas.
Y más, si es porque en él la
bella Doña Petronila

a la Música, en su voz,
nueva añada melodía.

¿Enseñar Música a un Angel?

110 ¿Quién habrá que no se ría
de que la rudeza humana
las Inteligencias rija?

Mas si he de hablar la verdad,
es lo que yo, algunos días,
por divertir mis tristezas
di en tener esa manía,

y empecé a hacer un Tratado
para ver si reducía
a mayor facilidad

120 las reglas que andan escritas.

En él, si mal no me acuerdo,
me parece que decía
que es una línea espiral,
no un círculo la Armonía;

y por razón de su forma
revuelta sobre sí misma,
lo intitulé Caracol,
porque esa revuelta hacía.

130 Pero éste está tan informe,
que no sólo es cosa indigna
de vuestras manos, mas juzgo
que aun le desechan las mías.

Por esto no os le remito;
mas como el Cielo me permita
a mi salud más alientos
y algún espacio a mi vida,
yo procuraré enmendarle,
porque teniendo la dicha
de ponerse a vuestros pies,
140 me cause gloriosa envidia.

De Don Martín y Don Pedro
no podéis culpar de omisas
las diligencias, que juzgo
que aun excedieron de activas.

Y mandadme; que no siempre
ha de ser tal mi desdicha,
que queriendo obedeceros,
con querer no lo consiga.

150 Y al gran Marqués, mi Señor,
le diréis, de parte mía,
que aun en tan muertas distancias

conservo memorias vivas;
que no olvido de su mano
sus mercedes recibidas:
que no son ingratos todos
los que, al parecer, se olvidan;
que si no se lo repito,
es por la razón ya dicha
de excusar que lo molesta
160 ostente lo agradecida;
que no le escribo porque,
siendo alhaja tan baldía
la de mis letras, no intento
que de embarazo le sirva;
que el carácter de crecer
el número a su Familia,
le tengo impreso en el alma
si no sale a las mejillas;
y que ya que mi desgracia
170 de estar a sus pies me priva,
le serviré en pedir sólo
a Dios la vuestra y su vida.

ENDNOTES

¹ Guillermo Orta Velázquez, *Breve historia de la música en México* (Mexico: Librería de Manuel Porrúa, 1970), 198-200. The author does not specify by name which treatises he had the opportunity to examine.

² Francisco de Burgoa, *Geográfica descripción de la parte septentrional, del polo ártico de la América* (Mexico: Juan Ruyz, 1674), chapters 39, 77, and Index.

³ For more biographical information, see Robert Stevenson, “El mas notable de los maestros Indígenas,” *Heterofonía* XI (Julio-Agosto 1975): 3-9.

⁴ Burgoa, *Geográfica descripción*, chapter 39.

⁵ Burgoa, *Geográfica descripción*, Index. Also cited by Gabriel Saldivar in his *Historia de la música en México* (Mexico: Editorial Cultura, 1934), 113-114.

⁶ This position is shared by other scholars dealing with the subject. For further references see Saldivar, *op. cit.*, 113-114.

⁷ Gioseffo Zarlino, *The Art of Counterpoint* (Part III of *Le Istitutioni harmoniche*, 1558), trans. Guy A. Marco and Claude V. Palisca (New York: W.W. Norton, 1976), 52.

⁸ Zarlino, *The Art of Counterpoint*, 68.

⁹ Joel Lester, "Root-Position and Inverted Triads in Theory Around 1600," *Journal of the American Musicological Society* XXVII (1974), 110.

¹⁰ Johannes Lippius, *Synopsis of New Music* (Strassburg, 1612), trans. Benito Rivera (Colorado Springs: Colorado College Music Press, 1977), 41.

¹¹ Thomás de Sancta María, *Libro llamado arte de tañer fantasía* (Valladolid, 1565), new edition with introduction by Denis Stevens (Heppenheim, West Germany, 1972), folio 13v.

¹² For further discussion of the theories of Lippius on this subject see Benito Rivera, *German Music Theory in the Early 17th Century: The Treatises of Johannes Lippius* (Ann Arbor: UMI Research Press, 1974), 88-103 and 123-124.

¹³ Lippius, *Synopsis*, 40.

¹⁴ Benito Rivera, *German Music Theory in the Early 17th Century: The Treatises of Johannes Lippius* (Ann Arbor: UMI Research Press, 1974), 123.

¹⁵ Rivera, *German Music Theory*, 124.

¹⁶ Orta-Velazquez, *op. cit.*, 197-198; Saldívar, *op. cit.*, 130-131; Alfonso Méndez-Plancarte, ed., *Obras completas de Sor Juana Inés de la Cruz*, 5 vols. (Mexico: Fondo de Cultura Económica, 1951), I, xliv.

¹⁷ Orta-Velázquez, *op. cit.*, 198.

¹⁸ Karl Vossler, *Die Sehnte Muse von Mexico* (Munich, 1934), translated by Pedro Henríquez Ureña as *La Décima Musa de México* in the prologue to *Obras escogidas de Sor Juana Inés de la Cruz* (Mexico: Colección Austral, 1939), 15-43.

¹⁹ Méndez-Plancarte, *op. cit.*, xliv.

²⁰ Numbers refer to the lines of the poem as reproduced in Appendix A.

²¹ It is unlikely that Sor Juana and Matías ever met. However, it is obvious that she was acquainted with Matías' theory of the "perfect circle."