

## **Vincenzo Galilei and Music: Some Socio-Cultural and Acoustical Discussions**

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### **ABSTRACT**

Vincenzo Galilei (1520?-1590) - father of Galileo Galilei- was a music theorist and lutenist. In his treatises he advocated that music was primarily based on physical phenomena, namely sound, and dismissed the Pythagorean-Platonic musical tradition based on number and ratio. Our aim in this article is to point out that Galilei viewed music as a physical phenomenon, sound, organized by natural as well as by socio-culturally defined rules.

### **Keywords:**

History of Music; History of Science; Vincenzo Galilei; 16<sup>th</sup> Century; Renaissance

### **RESUMO**

Vincenzo Galilei (1520?-1590), pai de Galileo Galilei, foi um músico teórico e alaudista que escreveu vários tratados sobre música. Neles, ele demonstrou que a música era um fenômeno natural sonoro, contradizendo a tradição vigente platônico-pitagórica, que entendia música como número e proporção. Neste artigo pretendemos mostrar que Galilei evidenciou que o princípio da música era som, porém, as causas de sua organização poderiam ser tanto de ordem natural quanto convencional.

### **Palavras chave:**

História da Música; História da Ciência; Vincezo Galilei; Século XVI; Renascimento

## Vincenzo Galilei and Music: Some Socio-Cultural and Acoustical Discussions

The repertoire of Western European music during the 14<sup>th</sup> century was enlarged by compositions with intervals of thirds and sixths<sup>1</sup>. From the late 15<sup>th</sup> century and 16<sup>th</sup> century on, *polyphony*<sup>2</sup> was at zenith. As a result, the range of consonances<sup>3</sup> was extended in musical practice and musical theory was confronted with the task of accounting for these new undertakings<sup>4</sup>.

Theorists dealt in various ways with this difference between theoretical and practical music. Some, like Franchino Gaffurio (1451-1522), wrote theoretical treatises and their practical counterparts: *Practica and Angelicum* counterparts to his *Theorica* and *De armonia musicorum instrumentorum*, whereas others tried to adjust theory. Musical theory was then mostly based on the Pythagorean-Platonic tradition<sup>5</sup> in which music was understood as number and ratio. The theorist Gioseffo Zarlino (1517-1590), through the *scenario*,<sup>6</sup> incorporated the “new” intervals.

However, according to Vincenzo Galilei, changes in musical practice demanded more than an improved theory. Theories were being reworked by his contemporaries mostly based on critical examination of the ancient sources<sup>7</sup> and, as mentioned above, as an attempt to fit practice into theory and sometimes vice-versa<sup>8</sup>.

Concerning ancient sources, Galilei believed that whoever the author was, modern or ancient, he ought to confront the false allegations found in the music-theoretical literature. Authors should not propagate an idea for its authoritative origin<sup>9</sup> and more: “[...] even when things are seen in a source, if the source treats of those matters subject to the senses, no matter who the writer is, one must examine whether or not they are true [...]”<sup>10</sup>.

<sup>1</sup> The intervals primarily used were octaves (E.g.: C-c), fifths (C-g) and fourths (C-f) and then, thirds (C-e) and sixths (C-a).

<sup>2</sup> In this period, polyphony was understood as the simultaneous use of a number of individual melodic lines, therefore, making a complex textured composition with a number of autonomous voices. For further information, see: *The New Grove Dictionary of Music and Musicians*, ed. Stanley Sadie (London: Macmillan, 1980), xv: 70-2.

<sup>3</sup> We will use the definition given by Galilei in his works, which follows the *Vocabolario della Crusca* (Venezia: Ap. Giovanni Alberti, 1612) *vocabolario.signum.sns.it*. Consonance is then defined as the listening of a pleasant sound which the parts agree or sounds that “concord”.

<sup>4</sup> D. J. Grout, *A History of Western Music* (New York: W.W.Norton & Co., 1973); G. Reese, *Music in the Renaissance* (New York: W.W. Norton & Co., 1959).

<sup>5</sup> This tradition was transmitted by the writings of S. N. Boethius in his treatises *De musica* and *de Institutione arithmetica* through the Middle Ages to the Renaissance.

<sup>6</sup> *Scenario* was an extended Pythagorean-platonic system. The Pythagorean system enclosed the proportions of the intervals of octave, fourth and fifth and Zarlino extended it into thirds and sixths.

<sup>7</sup> H. F. Cohen, *Quantifying Music* (Dordrecht; Boston and Lancaster: D. Reidel Pub. Co., 1984), 181-2.

<sup>8</sup> As in the case of Nicola Vicentino, who built a keyboard instrument named *archicembalo* that would allow playing the chromatic and enharmonic ancient genres. N. Vicentino, *L'Antica musica ridotta alla moderna prattica* (Rome: A. Barre, 1555).

<sup>9</sup> V. Galilei, *Dialogo della musica antica et della moderna* (Firenze: Giorgio Marescotti, 1581), 2; English translation in C.V. Palisca, *Vincenzo Galilei: Dialogue on Ancient and Modern Music* (New Haven and London: Yale University Press, 2003), 12.

<sup>10</sup> “[...] cerda di vedere in fonte quella tal cosa; et il medesimo si fa quando si scrivono cose udite degl’antichi piu oltre quando anco sono cedute in fonte le cose di qual sia scrittore, che tratti però di quelle cose che sono sotto poste al senso; si esaminano s’elle sono vere, o no”. V. Galilei, *Sopplimenti*, fol. 42. English translation, A. Moyer, *Musica Scientia: Musical Scholarship in the Italian Renaissance*, (Ithaca and London: Cornell University Press, 1992), 262. Or, “hora venghiamo di nuovo con questo essemplio all’esperienza del fatto”, Galilei, *Dialogo della musica*, 27.

Vincenzo Galilei was convinced that music was built on a false foundation and that the best possible means of achieving truth was the emergence of experimental evidence: “Moved by the search of truth, based on the experience of things and through demonstrations we came again to point out their errors”<sup>11</sup>.

Galilei became persuaded of his new idea while studying the physical behavior of musical instruments, especially his lute. He studied as well the material and conditions of other sonorous bodies, as vessels, coins and glasses<sup>12</sup>. He wrote particularly in four of his works on the importance and necessity of the musician to learn about theory and the behavior of his instrument<sup>13</sup>. In conclusion, he demonstrated that, rather than numbers, sound should be recognized as the basis for music<sup>14</sup>.

In this paper our starting point is the premise stating that music was based on sound, as proposed by Galilei and we aim to show that subsequently he insisted in the need to recognize the cultural and historical changes in the ways people organized musical sounds, and to know how these factors combined to produce music.

The manipulation or organization of sound into musical structures, like intervals or scales, was, according to Galilei due to art<sup>15</sup>: “That the extreme sounds of a *Dupla* would accord with those of a *Sesquialtera* it was of a natural cause, but that the latter would be divided into four, and the primer into seven intervals [...] is all merit of art”<sup>16</sup>.

Galilei followed the argument into the discussion of the nature of instruments: “the consonances born out of voices are not more natural than those born from strings”<sup>17</sup>. With such statements Galilei began a realm of discussion with the theorist Gioseffo Zarlino, fully presented in his work *Discorso intorno alle opera de Gioseffo Zarlino et altri importanti particolari attenenti alla musica* (Venezia, 1589), that would last until their deaths. For Zarlino, nature was at the same time *natura naturans*, a conception of the natural subject as *poiesis*, inherited from the peripatetic tradition, and *natura naturata*, nature as created by the divine mind<sup>18</sup>. Therefore for Zarlino, vocal music was natural as opposed to instrumental music, artificial.<sup>19</sup>

Galilei did not accept such classification. Vocal and instrumental music were for Galilei artificial, in the sense that music was not a natural device, but it had to be learned. The singing of a man and the humming of an animal would sound alike if no training would be taken by men<sup>20</sup>. Galilei went further to advocate that the best way for voices to learn how to sing would be through the training with instruments<sup>21</sup>.

<sup>11</sup> “[noi], mossi dalla verità, fondata nell’esperienza della cosa, venghiamo a far palese di nuovo il loro errore con diverse Dimostrazione”. V. Galilei, *Discorso intorno all’opere de M. Gioseffo Zarlino* (Venezia, 1589), 120.

<sup>12</sup> V. Galilei, “Discorso particolare intorno alla diversità delle forme del Diapason,” in *The Documentary Studies and Translation: Florentine Camerata*, ed. & trad. C. V. Palisca (New Haven and London: Yale University Press, 1989), 188-191.

<sup>13</sup> V. Galilei, *Il Fronimo* (Venice, 1568 and 1584); *Discorso particolare intorno all’uso delle dissonanze* (1588-91); *Discorso particolare intorno alla diversità delle forme del Diapason*; *Discorso particolare intorno all’unisono*. These last two, ed. by C. V. Palisca, *Florentine Camerata*, 152-191.

<sup>14</sup> The idea is developed throughout his work; the final statement is explicit many times in his *Discorso . . . Zarlino et altri importanti particolari attenenti alla musica* (Florence, 1589), 79 where it can be read: “Possiamo adunque con verità dire, di haver dalla natura la materia, che è il suono tanto dalla voci quanto dalle corde, & dall’arte la forma di qual sia intervallo tanto consonante quanto dissonante”.

<sup>15</sup> Galilei, *Discorso . . . Zarlino*, 77.

<sup>16</sup> “è bene naturale che gli estremi suoni della Dupla, & quelli della sesquialtera accordino; ma l’esser divisa questa in quattro, & quella in sette intervalli [...], e tutto cosa dell’arte [...]”. Galilei, *Discorso . . . Zarlino*, 21.

<sup>17</sup> Ibid, 81: “Le consonanze che nascono dalle voci non nascono dalla natura piu che si nascha quelle che ci danno le corde”.

<sup>18</sup> Ibid, 20.

<sup>19</sup> G. Zarlino, *Sopplimenti musicali* (Venetia: Francesco F. Senese, 1588), bk I, ch. 2-7.

<sup>20</sup> Galilei, *Discorso . . . Zarlino*, 99.

<sup>21</sup> Ibid, 25.

Consequently, the description of different instruments in his work had a special goal. Galilei was not just interested in a historical bookish tradition, but he needed to know the instruments in order to understand the differences between the music of diverse people.<sup>22</sup>

Vincenzo Galilei would approach musical diversities thinking of the causes based in nature, and those which were products of convention<sup>23</sup>.

Thinking of natural causes, Galilei addressed the differences in the modes<sup>24</sup>. He showed that as each different ethnic group would have a different vocal pitch for speech and singing, the differences in the modes would lie in the pitch range rather than on the placement of the semitone. The Greeks had used the modes as a means of transposing pitch to higher or lower ranges, unlike the church modes, as used by Zarlino and most theorists at Galilei's time, in which a change in mode was marked by a change in the relative position of the semitones:

“[...] when one nation or the other uttered words naturally while singing and speaking, or doing something in between the two, there existed between their sounds, with regard to highness and lowness, the difference to which you have learned [...]. This thing is seen and heard by whoever considers well[what] happens every day in many other provinces, and particularly in those of Italy, because the Lombards generally speak and sing in a deeper tone than the Tuscans do, and the people of Liguria speak in a higher voice than these.[This is sufficiently clear] without resorting to the Sicilians or more remote nations, and without leaving the confines of our province any more than absolutely necessary. If this, then, results from food, water, air or climate, we will leave such disputes to the inhabitants[of these places...]”<sup>25</sup>

Following the same argument, Galilei explained why instruments would also diverge between the nations along history:

“[...] The tension of the strings in the lyre and the way the holes are arranged in the aulos that the Dorians used were different from those of the Phrygians [...], and the Dorians proceeded with degrees and species of Diapason different from those of the Phrygians in their particular systems and tonoi [...]”<sup>26</sup>

<sup>22</sup> Galilei, *Dialogo della musica*, 2-4. He described many instruments he had seen in his trips and referred to many books and instruments that had been brought to him.

<sup>23</sup> The distinction between nature and convention is based on the distinction between *physis* and *nomos*. From the Greek concept of nature, a prime order of nature (*physis*) is distinguished from a second order (*nomos*), which was enlarged by a new role of orders suggested by convention. Greco-Roman Lexicum [www.iscsp.utl.pt/~cepp/lexico\\_grecoromano](http://www.iscsp.utl.pt/~cepp/lexico_grecoromano).

<sup>24</sup> We might summarily define them as a type of seven-note diatonic scales. They were placed in Greek antiquity by theorists in orderly fashion within a larger context and they were built out of tetrachords – a group of four consecutive notes - comprising the musical interval of a fourth (c-f); the notes were mostly arranged in a descending order.

<sup>25</sup> “[...] imperoche nel profferire naturalmente le parole, cantando e favellando, ò favellando cantando questa & quella natione, era tra il suono di esse circa l'acutezza & gravità, la differenza che havete inteso; [...]. La qual cosa vede & ode chi ben considera tutto il giorno accadere à molte altre provincie, e particolarmente dell'Italia. Imperoche con piu grave tuono parlano & cantano generalmente i Lombardi, di quello che fanno i Toscani; & con piu acuta voci di questi parlano i popoli della Liguria, senz'andare à trovare i Siciliani ò piu remote nationi, & scostarmi da confini della nostra provincia meno che io posso. Si questo poi avvenga da cibi, dalle acque, dall'aria, ò dal clima, lasceremo noi disputarlo à naturali;[...]”, Galilei, *Dialogo della musica*, 71; English trans. Palisca, *Modern Music*, 171.

<sup>26</sup> “[...] perche negli strumenti di fiato, & di corde, erano in altra maniera circa l'acutezza, & gravità, & quanto `a gradi della scala, tesse quelle nella Lira, & per altr'ordine disposti i fori di questo nella Tibia che usavano i

One of the consequences of these differences was that: “From the varied characteristics of the instruments it resulted that those who simply knew how to play the lyre and aulos that the Dorians used, did not for that reason know how to play the lyre and aulos of the Prygians and Lydians [...]”<sup>27</sup>.

Galilei advocated that the construction of musical instruments (*fabricazioni degli strumenti*) with different materials was also due to a natural cause, viz. the presence in nature of certain materials in a specific region:

“*Auloi* made with the material you described were not used generally but only by certain nations. Those made from shins of eagles and vultures were used by the Scythians, Andropophageans, and Malacans [Malachei], and those made of barley reeds by Osiris among the Egyptians. Later, in other nations, auloi were made of canes of lotus-and-boxwood, horns, bronze, silver, and shins of donkeys and deer, laurel branches, the elder-tree, raw leather, and other things. Because of the variety of sizes and of material, some grave forth soft and high-pitched sounds, others, according to need, big and low sounds.”<sup>28</sup>

In his work *Discorso intorno a diversi pareri che hebbono le tre sette piu famose degl'antichi musici, intorno alla cosa de suoni, et degl'accordi*<sup>29</sup>, while discussing the existence of different musical traditions Galilei concluded:

“[...] yet their [Pythagoras, Aristoxenus and Ptolemy] differences must not have consisted of petty considerations, yet the writers [who wrote about them...] mention superficially the causes of the dispute *but not the variety of conditions or the reasons that the parties had for opposing each other.*”<sup>30</sup>

As Galilei understood, natural causes could be influenced by social and economic conditions. Talking once more about the modes, he attributed some of the differences in the nature of the modes to the transformation of customs through time:

“These are things they say about the nature of the modes. Thus we see a great variety among writers, some saying one thing, others something else. Therefore I think this variety may be born *from the variety of customs in a region.*”

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Dorij, che nella Lira e Tibia che adoperavano i Frygij nel particolare Systema , & Modo loro”. Galilei, *Dialogo della musica*, 98; English trans. Palisca, *Modern Music*, 241.

<sup>27</sup> “[...] dalla varietà de quali accidenti nasceva, Che quelli i quali sapevano semplicemente sonare La Lira, & Il Piffero Che usavano i Dorij, non perciò sapevano sonare quella, & questo de Frygij e Lydij, [...]”. Galilei, *Dialogo della musica*, 98; English trans. Palisca, *Modern Music*, 241.

<sup>28</sup> “Le Tibie fatte delle materie che havete detto, non furono dall’universale usate, ma si bene da alcune nazioni particolari, imperoche quelle di stinchi d’Aquila & di Avoltoi furono usate nella Scithia dagli Androfagi, dagli Arimaspi, & da Malachei; & quelle di Calamo d’Orzo, da ofiride tra gli Egitij. Ne fu poscia da altre nazioni fatte di varie sorti di canne, di loto, di bosso, di corno, di bronzo, d’argento, di stinchi d’afino, di cervo, di ramo di lauro, di Sambuco, di cuoio crudo & d’altro, & cosi venivano per la diversità della grandezza & della materia, à rendere alcune di esse il suono piccolo, & acuto, & altre (secondo che era di bisogno) grande, & grave”. Galilei, *Dialogo della musica*, 100; English trans. Palisca, *Modern Music*, 247.

<sup>29</sup> Published and translated in Palisca, *The Florentine Camerata*, 164-179.

<sup>30</sup> “et pur è forza che le differenze loro non consistessero in cose di picciola consideratione; atteso che per leggieri cagioni non si sarebbero mossi; (quelli); [36v] che come neutrali ci accennano le cagioni superficialmente della lite, ma non la diversità delle conditioni, ne le ragioni che in lor favore ci distavano di quelli producevano le parti.” Galilei, *Discorso... et degl'accordi*, in Palisca, *The Florentine Camerata*, 164-6; English trans., 165 -7 (our italics).

*They changed over a long time, and so the modes changed as well [...] For example, let us take the Dorian, being originally honest, grave and severe; by changes of habits, it was changed too, and was then applied to matters of war*<sup>31</sup>.

Galilei's reading is of importance since the modes were believed to have a moral essence in Greek music. Music and education were tightly connected in Greek society, and were, accordingly to Galilei, mutable through history and time. He concluded: "[...] it is not inappropriate *that from variation of custom one should find a variety of musical harmony and modes.*"<sup>32</sup>

Galilei believed that the variation of habit occurred for many reasons. He related them to social conventions, to either bad or good habits acquired by different people at different times as to the construction and use of specific musical instruments.

In his *Discorso di Vicentio Galilei intorno all'uso dell'Enharmonico, et d'ichi fusse autore del Cromatico*, Galilei advocated "[...] that it was due to laws and not to ignorance that the *Spartani* reduced their music to a restrict number of strings"<sup>33</sup>.

Galilei attributed to habit, constant use and repeated hearings, the common tendency to prefer a specific sound. While talking about the interval of the fifth, we read:

*"[...] I say to you in addition that the fifth is understood with greater discrimination by the general public according to the proportion which Aristoxenus gave it than within...this, I firmly believe was the result of bad usage, which corrupted the sense, because the fifth, within the sesquialtera, not only seems to possess, but actually possesses a small degree of hardness due to the extreme amount it can be augmented [...] in the manner of Aristoxenus, however, it seems that the small degree of diminution gives it grace and causes it to become more in keeping with the taste of today [...]"*<sup>34</sup>

To what he concludes: "[...] *and I do not believe that that happens for any other reason except being accustomed to hearing them continually under that form, or similar one*"<sup>35</sup>.

<sup>31</sup> "Queste cose dicono intorno alla natura delli modi laonde si scorge un gran varietà negli scrittori; volendo alcuni una cosa, et alcuni un'altra: il perche mi penso che tal varietà possa esser nata dal varietà de costumi d'una provincia, che sendo dopo molto tempo variati, variassero ancora li modi; et che una parte degli scrittori parlasse di quelli modi che preserveravono d'essere nella loro prima et pura semplicità; et l'altra parte parlasse di quelli che già havevono persa la lor prima natura, come per cagion d'esempio diremo del dorio, che essendo prima honesto, grave, et severo; per la variatione de costumi, fusse variato anco lui; et applicato poi alle cose della guerra: et per questo non ci dovemo maravigliare, per cio che se dalla varietà dell'harmonie nasce la variatione de costumi come altrove si è detto; non è inconveniente ancora che dalla variatione de costumi si venga alla varietà dell'harmonie della musica, et delli modi". V. Galilei, *Compendio della teorica della Musica*, 1570, Bibl. Naz. Centr. Firenze, Galileiana, fol. 36r-v English trans. E. Moyer, *Musica Scientia*, 244 (our italics).

<sup>32</sup> "Queste cose dicono intorno alla natura delli modi laonde si scorge un gran varietà negli scrittori; volendo alcuni una cosa, et alcuni un'altra: il perche mi penso che tal varietà possa esser nata dal varietà de costumi d'una provincia, che sendo dopo molto tempo variati, variassero ancora li modi; et che una parte degli scrittori parlasse di quelli modi che preserveravono d'essere nella loro prima et pura semplicità; et l'altra parte parlasse di quelli che già havevono persa la lor prima natura, come per cagion d'esempio diremo del dorio, che essendo prima honesto, grave, et severo; per la variatione de costumi, fusse variato anco lui; et applicato poi alle cose della guerra: et per questo non ci dovemo maravigliare, per cio che se dalla varietà dell'harmonie nasce la variatione de costumi come altrove si è detto; non è inconveniente ancora che dalla variatione de costumi si venga alla varietà dell'harmonie della musica, et delli modi". Galilei, *Compendio della teorica della Musica*, 1570, Bibl. Naz. Centr. Firenze, Galileiana, fol. 36r-v; English trans. Moyer, 244 (our italics).

<sup>33</sup> "Quanto alla cosa della legge poi, ci siano per esempio oltre agl'Egitti, gli Spartani; i quali per molti secoli mantennero per legge et non per ignoranza la Musica loro drento al numero di pochissime corde". Galilei, *Discorso Enharmonico*, in Palisca, *Florentine Camerata*, 171.

<sup>34</sup> Galilei, *Discorso . . . Enharmonico*, 326-7 (our italics).

<sup>35</sup> *Ibid.* (our italics).

This reasoning was extended to an explanation of sense experience in tunings. Concerning the pleasantly listening of the tempered scale, in *Dialogo della musica antica et della moderna* we read that one of the characters could not understand why if the tuning of the lute was so “near to perfection”<sup>36</sup> and “so delightful on the lute”<sup>37</sup> it was not applied to instruments like keyboards. To what the answer is:

“[if a distribution delights in the lute, how can it displease in a keyboard instrument?] it is possible as the experience shows us. [...] It may happen because we have become accustomed to hear the intervals as I described them in the lute [...] if we wanted to temper the keyboard instrument according to the usage of the lute, we cannot escape having the sense be offended in certain particular places [...] the places where the this mainly happens are where we need to hear the difference between the major and minor semitones [...] the reason why they [intervals] manifest their qualities more in the keyboard instrument is that the material of the strings, the agent that strikes them, and the greater force and efficacy of their operation cause the sound to strike the ear more vehemently.”<sup>38</sup>

Technically, instruments had different systems of tuning. Fretted stringed instruments (*Viola d'arco, Lauto, lira con tasti*, etc.) used the essentially incited diatonic described by Aristoxenus, with a tone divided into two equal semitones, while the organ, *clavicembalo*, and modern harp had unequal semitones. Wind instruments and voice were able to vary their pitch to fit any system required. Galilei would explain the different tunings by different types of musical instruments as caused by both the history and customs of its development<sup>39</sup> and the physical behavior of a given instrument. Galilei began tracing the development of the cithara narrating different versions of a fable; according to the strongest “version”, the cithara would have developed from a small, four-stringed instrument invented by Mercury to a large instrument with an ultimate configuration of fifteen strings. He explained the choice of strings and the function of its resounding body<sup>40</sup> and illustrated with different drawings (Figures [1](#), [2](#), [3](#) and [4](#)).

Galilei also called the attention to the fact that, even when different instruments would require the same technique to be played, that did not mean that the instruments would function or sound alike:

“[clavicordo, harpicordo, clavicembalo, spinetta, buonaccordo, and others] yet in its essence the instrument is the same, and whoever knows how to play one knows how to play the other. No one of sound mind, comparing a sweet gravicembalo with a strident spinet, will label one in comparison to the other [...]”<sup>41</sup>

<sup>36</sup> The term “perfection” connotes completion .

<sup>37</sup> Galilei, *Dialogo della musica*, 47.

<sup>38</sup> Ibid, 47-8: “sendoci l’esperienza di mezzo che ce lo dimostra. [...] Può forse questo nascere dall’havere assuefatto il senso, d’udire sempre nel liuto gli intervalli nella maniera che di già vi ho ditto contenergli. [...] il volere hora, che questo si temperi second l’uso di quello, non può in alcuni luoghi particolari [...] i luoghi particolari son principalmente quelli, dove occorre udire la differenza del maggiore dal minore Semituono.[...] la cagione che quelle [intervalli] manifestano vi è piu di queste la qualità loro, non d’ altro nasce, che dall’havere la materia di esse corde, & dell’agente che le percuote, piu forza & efficacia per la loro attività, di ferire l’udito con vehementia maggiore”.

<sup>39</sup> Galilei, *Dialogo della musica*, 126-149.

<sup>40</sup> Ibid, 113-2.

<sup>41</sup> “[clavicordo, d’Harpicordo, di Clavicimbalo, di Spinetta, di Buonaccordo, d’Harchicimbalo, & altro] , & pur nella sua essentia è l’istessa cosa l’uno che l’altro, & che fa sonare questo, suona parimente quello. Non sarà

Music was made according to natural laws, rules and training. The musician, as advocated by Galilei, had to be trained: his ears, his mind and his body. One must learn how to approach the instrument and how to produce sound.

However, to acquire *techne* would not secure the musician a recognized place. Instruments would also carry social identifications. Galilei distinguished the “citharoedist” (*citharedo*), who sang and accompanied himself on the cithara, from the “citharist” (*citharista*), who played solo instrumental music and pointed out that the citharoedist was more honored than the citharist<sup>42</sup>.

The combination of instruments would also be done according to their capacity of tuning; either in families - of lutes or recorders, etc. - or between instruments that could adapt their tuning to each other and also regarding to their function: sacred, secular, chamber music, etc.

Galilei described many different instruments he had seen in his trips and he innovated by illustrating the *Dialogo della antica et della moderna musica* with many drawings of ancient instruments, providing also charts of tunings (Figures 5 and 6).

Galilei went further to criticize some current performances and to classify the types of existent musicians. Speaking from experience, he gave a caustic appraisal of excessive instrumental divisions in his discussion of contemporary instrumental music<sup>43</sup>:

“[...] each of these performers, generally speaking, merits the reputation he has for something so long as he performs with the excellence considered appropriate. I warn those, however, who have one particular need: to demonstrate the disposition of lip, agility of tongue, and velocity of fingers, thinking that this constitutes mastery. They diminish so much the true essence of the air, countenance, image, and natural beauty of any piece you give them, enveloping it from head to toe in the confused mist of their *passaggi* and runs (*tirate*), as they are called. By means of this disproportionate and unbecoming masquerading, to call it by name, we are confronted with the same difficulty as people had in the time of Cimabue and Giotto to discern in their paintings many principal and most important distinctions.[...] There is also no lack of persons like these among players of lute and keyboards instruments, but enough said”<sup>44</sup>.

Concluding, Vincenzo Galilei treated music simultaneously as a physical-phenomenon and a cultural one. His major statement would be that music was a human creation, based on physical laws, which governed the production of sound as well as a

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alcuno ancora di sana mente, che comparando um suave Gravicimbalo à una stridule Spinetta, non giudichi questa à comparatione di quello,....”. Galilei, *Dialogo della musica*, 61; English trans. Palisca, *Modern Music*, 148.

<sup>42</sup> Galilei, *Dialogo della musica*, 99.

<sup>43</sup> Galilei provides descriptions of particular examples of instruments, of modern performers and the development of the “virtuoso”, which represent valuable descriptions of the world of performance and instruments during the last three decades of the 16<sup>th</sup> century.

<sup>44</sup> “I quali professori in universale parlando dico, che ciascheduno merita da qual cosa essere reputato, tutta volta che in esso operi in quella eccellenza che si desidera convenirsi; avvertendo però quelli che bisogno ne hanno di questo solo particolare: il quale per mostrare la dispositione del labbro, l’agilità della lingua, & la velocità delle dita loro, credendosi che in esse consista il sapere; diminuiranno talmente dal vero il suo essere, l’aria, la sembianza, l’effigie, & la natural bellezza di qual si voglia cantilena che gli dia tra le mani; involgendola dal capo alle piante nella confusa nebbia di quei loro alati passaggi ò tirate che se le dichino, mediante il quale sproportionato & disdicevole immascheramento, è per conoscerla à nome l’istessa difficoltà che era ne’ tempi di Cimabue & di Giotto, il discernere nelle pitture loro molte principali & importantissime differenze.[...]non mancano ancora di questi tali tra sonatori di Liuto & tasti, ma siane detto à bastanza ”. Galilei, *Dialogo . . . moderna musica*, 141-2; English trans. Palisca, *Modern Music*, 352-3.



sonorous phenomenon subjected to culturally defined rules. Galilei believed that combinations of sounds, described as consonances or dissonances, were first due to a natural cause and then to convention, and this was the reason “why the music who pleased the Italians did not pleased in the same way other nations”<sup>45</sup>.

Galilei took musical instruments as sources of knowledge. They were complicated devices and the musician should rely for their construction and function on complex combinations of materials and physical principles. Galilei was one of the first authors to consider these factors quantifiable, whereas traditionally they had been seen as qualitative variables.

For Galilei, to work as a musician was to work in regard to sounding bodies, considering primarily the quality of sound instead of the type of mathematical quantity. To discern between consonances and dissonances required an awareness of and - why not?-, theorizing on more characteristics than the Pythagorean-platonic approach could provide. As understood by Galilei, the musician had to be trained to achieve such knowledge: ears, mind and senses; in this way he would be able to understand the realm of the physical behavior of sound that, although it could be represented by numbers, became relevant on the grounds of the cultural and social context.

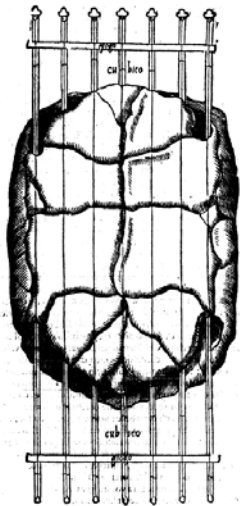


Figure 1: The *Lira* of Mercury as described by Homero, V.Galilei, *Dialogo...moderna musica*, p.126. [\(back\)](#)

Figure 2: One of the ways that de ancient lira was described by many philosophers. V.Galilei, *Dialogo...moderna musica*, p.129. [\(back\)](#)



<sup>45</sup> Galilei, *Discorso . . . Enharmonico*, fol. 7.

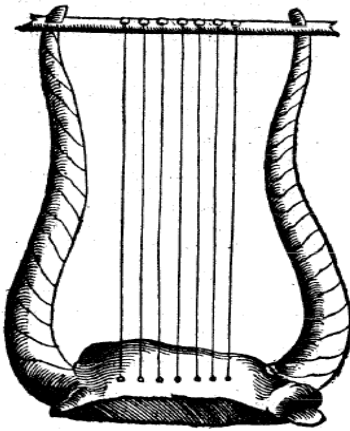


Figure 3: Lira as described by Hyginio in his *Segni celesti*, book 3. V.Galilei, *Dialogo...moderna musica*, p.129. [\(back\)](#)



Figure 4: Plectro. Used to play the harp.V.Galilei, *Dialogo...moderna musica*, p. 130. [\(back\)](#)

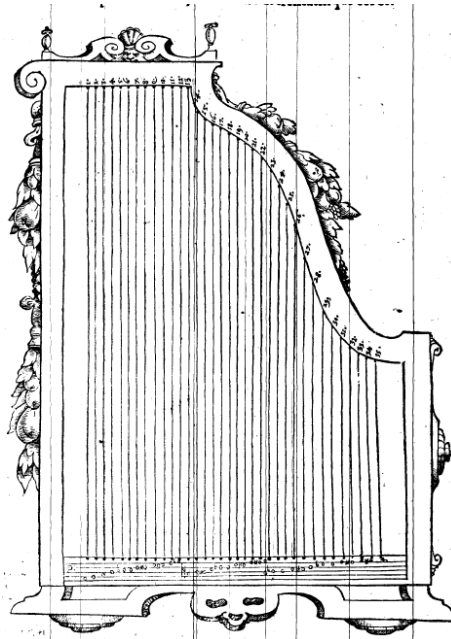


Figure 5: Instrument named *Simico* of 35 strings. V.Galilei, *Dialogo...moderna musica*, p. 41. [\(back\)](#)

*Temperamento dell' Harpa.*  
Acuto.

<i>parte destra</i>	5	<i>parte sinistra</i>
Ddd 1		
Ccc 2		3. X Ccc.
Bbb. 4		5. hhh.
Aaa. 6		7. Aaa.
Gg. 8		9. X. Gg.
Ffi 10		11. X.Ff.
Ee. 12		13. b.E.
Dd. 14		15. Dd.
Cc. 16		17. X.Cc.
Bb. 18		19. h h.
Aa. 20		21. Aa.
g. 22		23. X.g.
f. 24		25. X. f.
E. 26		27. b. e.
d. 28		29. d.
X. c. 30		31. c
h. 32		33. b.
a. 34		35. a.
X. G. 36		37. G.
X. F. 38		39. F.
b. E. 40		41. E.
D. 42		43. D.
X. C. 44		45. C.
h. 46		47. B.
A. 48		49. A.
X. r. 50		51. r.
X. FF. 52		53. FF.
b. EE. 54		55. EE.
DD. 56		57. DD.
		58. CC.
		G. auc.

Figure 6: The tuning of the harp. V. Galilei, *Dialogo... moderna musica*, p. 144. ([back](#))

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