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THE ORIGIN OF ITALIAN LUTE TABLATURE:  
VENICE CIRCA 1500 OR NAPLES BEFORE PETRUCCI?

by DINKO FABRIS

In his book *Les Luthistes espagnoles* published in 1902 Count Guillermo de Morphy gave the following explanation of the origin of Lute tablature:<sup>1</sup>

*Erklärung der Tabulatur.*

Die Tabulatur [...] ist wahrscheinlich orientalischen Ursprungs und es ist zu vermuten, dass sie von den Völkern erfunden worden ist, welche seit so vielen Jahrhunderten Instrumente dieser Art bekannt und benutzt haben. Doch fehlt es an Beweisen, dies bestimmt zu behaupten, und ich unterdrücke daher mehr oder minder wahrscheinliche hypothetische Konstruktionen der Phantasie. Lieber warten wir ab, dass Spezialstudien über diese Frage Licht verbreiten. Meines Wissens wurden die ersten Tabulaturen zu Anfang des 16. Jahrhunderts von Ottaviano Petrucci gedruckt. Auch das spricht für den orientalischen Ursprung dieser Art der Notierung, da man weiß, in wie regem Verkehr die Republik Venedig mit den Völkern des Orients stand [...].

In the preface to the same book, Morphy's mentor and friend, the eminent Belgian musicologist François-Auguste Gevaert, told a different story:<sup>2</sup>

Morphy incline à croire que le talent du luthiste espagnol s'est formé en Italie; il croit aussi que la tablature de luth reconnue généralement pour être d'origine orientale, a pénétré en Europe par l'intermédiaire de Venise. Pour ma part je ne saurais actuellement me rallier à cette manière de voir. Je tiens l'art [...] pour indigène dans la péninsule hispanique, et je pense que de là cette technique instrumentale, y compris sa notation particulière, s'est répandue dans les pays italiens, qui, à leur tour, l'ont transmise aux peuples du Nord [...].

My paper will not resolve old questions, but just give a personal interpretation of one small problem in the history of European thought about which I and other colleagues have been thinking during the last twenty years. This new interpretation will not be based on new musical documents but rather through a different organisation of the information already known. For this reason I will adopt the tools of the semiotics instead of musical philology and analysis. They are related not to the analysis of the code of the musical notation elaborated by the semiology of music, but to the socio-linguistic and anthropological theories of Goody and Calvet.<sup>3</sup> The results will not change

<sup>1</sup> Guillermo de Morphy, *Les luthistes espagnoles*, Leipzig 1902, XVII. I wish to thank John Griffiths for his suggestions in preparing the final version of this text.

<sup>2</sup> *Ibid.*, XI.

<sup>3</sup> See Jack Goody, *La raison graphique*, Paris 1979 and *La Logique et l'écriture*, Paris 1986; Louis-Jean Calvet, *Linguistique et Colonialisme. Petit traité de glottophagie*, Paris 1974 and *Histoire de l'écriture*, Paris 1996. See also U. Eco, *Trattato di semiotica generale*, Milan 1975.

the course of history of Italian music but may contribute to illuminate a lesser-known chapter in the history of notation and of instrumental music. The fact that Petrucci published the earliest lute tablature in Venice in 1507, the first printed examples of music intended for a solo instrument utilising the so-called „Italian lute tablature“, justifies this discussion.

Before Petrucci we find only few fragments of different types of lute tablature, that testify to the existence of a fifteenth-century tradition of writing for an instrument played both with or without plectrum (as suggested by Tinctoris around 1483).<sup>4</sup> Petrucci (or lutenists around him like Spinacino, Bossinensis or Marco dall'Aquila) did not invent the system itself, but chose and modified one of the existing models of tablature.

The argument that I wish to develop is based on specific details of the nature of various forms of tablature, both those that are based on numbers and those that derive from letters of the alphabet. In this light, let us consider first the „German“ lute tablature. This notation, very different from the contemporary organ keyboard tablature called „Old German“, is based on a mixture of numbers and alphabet letters. Letter notation, in contrast to Guidonian solmisation, was known throughout the middle ages. This seems to have been developed in Germany into a form of keyboard tablature during the fifteenth century. German lutenists adapted this system to the lute (when the instrument had 5 courses), adding numbers as well. This mixture was typical of early forms of Arabic lute notation that used a mixture of numbers and letters, but with different functions: letters for pitch, numbers for rhythm. This aspect was stressed in particular by H. G. Farmer, a musicologist whose theories on the Arabic influences on Western music were controversial and not well accepted. Farmer, for example, cites Hucbald's *De harmonica institutione* as the oldest reference to the alphabet notation in use in medieval Europe, that he considers derived from the Arabic *'ud*.<sup>5</sup>

Some centuries later the anonymous *Ars de pulsatione lambuti et aliorum similium instrumentorum* (a manuscript dated 1496–97, once in the Capucino Monastery, Gerona) states that the alphabet notation applied to the lute was indeed of Arabic origin, invented by a „Fulan maurus de Regno Granatae“.<sup>6</sup> This hypothesis was accepted by Gevaert: „Les instrumentistes chrétiens auront élaboré leur tablature à l'imitation de celle des Musulmans.“<sup>7</sup>

It seems that the oldest surviving examples of such notation in the Arabic tradition, dating in the period between the fourteenth and the fifteenth cen-

<sup>4</sup> Johannes Tinctoris, *De inventione et usu musicae*, original lost (some extract printed Naples, c.1483; other extracts in F-CA); ed. in Anthony Baines, „Fifteenth-century instruments in Johannes Tinctoris's *De inventione et usu musicae*“, *Galpin Society Journal* 3 (1950) 19–26.

<sup>5</sup> Martin Gerbert (ed.), *Scriptores ecclesiastici de musica sacra potissimum*, St. Blasien 1784; repr. 1931, I, 118.

<sup>6</sup> Cit. in Jayme Villanueva, *Viaje literario a las Iglesias de España*, Valencia 1821; the word „Fulan“ means „Unknown“. This reference has been also cited in V. Ivanoff, article „Lautentablaturen“, section to 1500, *MGG*<sup>2</sup>, 7 (1997) 370.

<sup>7</sup> Gerbert, op.cit., I, 118.

turies, use a mixture of elements in which the pitch of notes is determined by the letters of alphabet, and the mensural values by numbers.<sup>8</sup> It is precisely this mixture that we find in the „German“ system, printed for the first time in Sebastian Virdung's *Musica getutscht* (Basel 1511), only few years after Petrucci's first lute prints. Virdung's description of „German lute tablature“ was considered valuable twenty-five years later since it was reproduced in the free Latin translation of his treatise published by Luscinius in 1536. In this same year the first lute tablatures were printed in both Spain (Luis Milan) and Naples (Francesco da Milano). It should be noted that in the intervening years a French translation of Virdung appeared (Vorsterman 1529), but that the first French lute book published in the same year (Attaingnant 1529) introduces „French lute tablature“ in place of Virdung's „German tablature“. In the thirty years after Petrucci's first publication, all four basic types of European lute tablature had already appeared in print, and it is not surprising to discover them discussed alongside one another in the broadside lute instructions published in Italy in the last decades of the sixteenth century by Michele Carrara and others (many reprints between 1585 and 1618). It is noteworthy that in a broadside intended for a wide and popular audience, equal importance is given to „Italian“, „French“ and „Neapolitan“ tablature but that the „German“ system is ignored altogether.<sup>9</sup>

It is similarly unusual that there are no books or manuscripts of lute music written in the „Neapolitan“ system during the entire sixteenth century except for the *Libro secondo della fortuna* printed in Naples by Francesco da Milano in 1536. Sixty-five years after Carrara's broadside (in which the example in Neapolitan tablature is in fact not correct),<sup>10</sup> the latest reference to this system appears in Pier Francesco Valentini's *Il Leuto Anatomizzato*, a Roman manuscript treatise dated 1650 where the examples are given translated from „Italian lute tablature“ to the „French“ and „Neapolitan“ ones.<sup>11</sup> But who was still using this last system at so late a date?

Another somewhat earlier reference to the late survival of „Neapolitan tablature“ is given in Scipione Cerreto's *Della pratica musica vocale et strumentale* (Naples 1601) (Libro IV, p.313), and what is particularly interesting here is his reference to these as the „zero“ and the „one“ systems:

<sup>8</sup> Henry G. Farmer, *History of the Arabian music*, London 1929, 202 indicates two examples from the 14th century. Late examples are in the MSS works by Ghaibi, dead in 1435. See also id., *An old Moorish lute tutor: Being four Arabict texts from unique manuscripts*, Glasgow 1933.

<sup>9</sup> On Carrara and other broadside lute instructions see Dinko Fabris, „Lute tablature instructions in Italy: A survey of the *Regole* from 1507 to 1759“, in: *Performance on lute, guitar, and vihuela. Historical practice and modern interpretation*, ed. by V. Coelho, Cambridge 1997, 16–46.

<sup>10</sup> The system adopts the series without zero, but on the reverse direction of the stave, with the top line down like in the normal Italian tablature. See *ibidem*, 41–45.

<sup>11</sup> MS I-Rvat, Barb.Lat.4395; facsimile ed. by O. Cristoforetti, Florence 1989.

Volendo il principiante Sonator del Liuto imparare l'Intavolatura sopra il Liuto [...] deve prima intendere, che hoggidì si usano due sorti d'intavolatura, una è detta del Zero, & l'altra del I. Ma per essere quella del Zero più commune, sarà bene di essa trattare.

The coexistence of these two systems of tablature in Italy is illustrated in Sultzbach's 1536 Neapolitan print of lute works by Francesco da Milano (*Intavolatura de Viola overo Lauto. Libro I, II „della Fortuna“*), in which the first book is edited in the Italian „zero“ system and the second book in the Neapolitan „one“ system. It is not by chance that the preface of the first book gives a practically identical version of the *Regole per quelli che non sanno cantare* published by Petrucci in 1507. But in the second book the rules inserted are different and state that tablature „without the Zero“ was an entirely new invention:

Gli antichi mettevano un zero, ò vero .o. che significava vacante, & pero quando sarà signato .1. significa che se toccha quella corda, dove è tal segno vacante [...].

This evidence of these instructions has been used to resolve the question of the origin of this type of tablature and to fix Naples 1536 as the birthdate of what we now call „Neapolitan tablature“. But how can this be justified in light of the existence of at least two fragments of viola/lute music written in exactly the same system „without the Zero“, dating not only before 1536 but probably before 1507?

There are two surviving Italian lute manuscripts from the period before Petrucci. They are the well-known „Heart-shaped manuscript“ Pesaro, Biblioteca Oliveriana MS 1144 (PES 1144), and the fragments in Bologna, Biblioteca Universitaria MS 596 H.H.2<sup>4</sup> (BOL 596). Neither uses the „Italian“ tablature system. The earliest sources written in „Italian lute tablature“ all appear after the first example published in Venice 1507 by Petrucci:

1. Paris, Bibliothèque Nationale, MS Rés. Vmd. 27, the „Thibault manuscript“ (THIB)
2. Fribourg, Capucin Monastery MS Falk 105, now Bibliothèque Cantonale et Universitaire, Ms. Cap. Res. 527, f. 2 (a fragment of only two pages)
3. Chicago, Newberry Library MS VM C.25, the „Capirola lute book“ (CAP)
4. London, British Library, MS Add. 31389
5. Florence, Biblioteca Nazionale, MS Banco Rari 62, 12 (a frottola intabulation on one sheet)

These manuscripts are all of Northern Italian provenance and can be dated between 1510 and 1520. All other manuscript sources in „Italian lute tablature“ are later and follow Petrucci's model. Only the earlier sources, in particular THIB and CAP, show a series of notational elements that strongly differ from

the Petrucci style.<sup>12</sup> In any case, it is not possible to prove that the Italian system was already in use before the appearance of Spinacino's first book printed by Petrucci.

In the autograph manuscript treatise *Il Trimerone* by Ercole Bottrigari (1593–99) there is a comment on the musical „ziffre“ that one can „ragionevolmente connumerare i caratteri e i segni usati da' sonatori di lauto e di arpicordo o clavacembalo nelle loro, com'essi le chiamano, intavolature“.<sup>13</sup> Bottrigari starts with the usual description of the tablature stave of six lines representing the six lute strings. After that he discusses the „Letters of the alphabet, used by ancient lutenists, instead of which the moderns use our arithmetical characters“.<sup>14</sup> The musical examples copied in this text are two intabulations, in the „French“ and the „Italian“ system, of the canzone *Stavasi amor dormendo sotto un faggio*. He seems to believe that Italian tablature is derived from „German“ or „French tablature“, and he is apparently unaware of the continuing spread in Europe of these systems. Bottrigari was close to the truth. Virdung in 1511 attributed the invention of the „German lute tablature“ to Conrad Pauman in Nürnberg (died in 1473).<sup>15</sup> The earliest fragments of lute music until now identified were written shortly after Pauman in the „German“ system (the *Königsteiner Liederbuch*, dated 1470–73). But this system is apparently not related at all to the Italian one that cannot be based on the „German“ system (Plate 1).

The „German“ system seems not to be related to the type adopted in the earliest Arabic lute tablatures, except for the contemporary presence of letters and numbers. To find a rather similar system of signs in lute tablature we have to go very far, to ancient Japan of about 700, the date of the oldest known piba/biwa tablatures for the Sino-Japanese lute. This kind of tablature is very easy to learn, consisting of twenty primary symbols showing the finger on the four strings of the instrument<sup>16</sup> (Plate 2).

On the contrary, both „Italian“ systems, with or without the zero, are based on the linear series of arithmetic numbers, one for each fret, and the series is repeated on each string. This is also the system adopted by Arabic lute tablatures imported first in Europe, with the sole change being the use of letters in the place of numbers, exactly like the French lute tablature documented in print only after 1529.

<sup>12</sup> See Dinko Fabris, „Le prime intavolature: edizioni a stampa e manoscritti per liuto in Italia fino al 1540“, paper presented to the conference *Venezia 1501: Petrucci e la stampa musicale* (Venice 10–13 October 2001), in press.

<sup>13</sup> I-Bc, MS B 44, 139–41 (I am grateful to the librarian Mario Armellini for the reproduction of the source). See also Giuseppe Vecchi „Primi accenni ad una semeiografia musicale nel *Trimerone* (Giornata III) di Ercole Bottrigari“, *Quadrivium* 12 (1971) 321–46.

<sup>14</sup> „Lettere dell „Abcdario, usate dagli antichi lautisti, invece delle quali i moderni adoperano i nostri caratteri aritmetici“ (iv).

<sup>15</sup> „Der hat den Kragen der fünff Köre, und auff sieben bünde das gantze alphabet haissen schreiben“ (Basel 1511, folio k 3v).

<sup>16</sup> R. F. Wolpert, „A ninth-century Sino-Japanese lute-tutor“, *Musica Asiatica* I (Oxford 1977) 111–165.

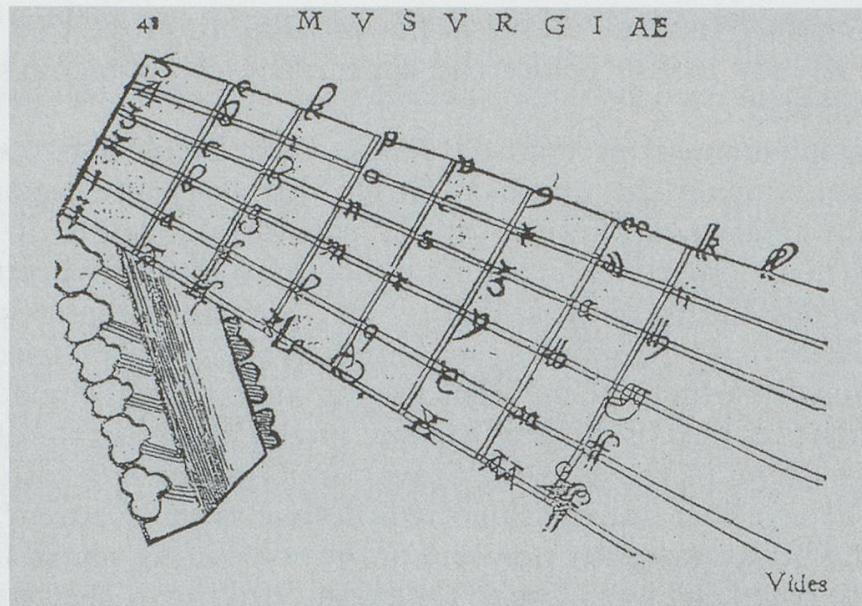


Plate 1: The system of the „German lute tablature“ from Ottomar Luscinius, *Musurgia seu praxis musicae* (Basel 1536), latin translation of Virdung's *Musica getutscht* (Basel 1511).

	IV	III	II	I
0	A* ←	c L e k	a ↗	↑
1	B I	d ↘	# k	h
2	c K	# +	g h	i
3	# J	e Z	# Z	# M
4	d K	f Z	a Z	d H

Plate 2 : The system of the Sino-Japanese lute-tablature (since 9th century) from R. F. Wolpert, „A ninth-century Sino-Japanese lute-tutor“, *Musica Asiatica I* (Oxford 1977) 116.

An earlier diagram inserted in a Venetian music treatise dated between 1490 and 1500 represents the six strings of a lute.<sup>17</sup> Here the frets, including the

<sup>17</sup> I-Vnm MS Lat. 336, coll.1581 (f. 1r). See Fabris, „Lute Tablature Instructions in Italy“, 21.

nut, are indicated by a series of numbers from 1 to 8. The open and fretted positions for each string are labelled with the corresponding letter of alphabet notation. This implies that the two systems were still co-existing shortly before Petrucci's prints and in the same city. But if this is true, the zero was not present and the tablature compared with the French type was indeed the Neapolitan one. The same occurs in BOL 596: here letters from the medieval alphabet notation are written under the tablature numbers, presumably to clarify the musical significance of a notation that was still hardly known (Plate 3).



Plate 3: Bologna, Biblioteca Universitaria MS 596 H.H.2<sup>4</sup>: exemple of „Neapolitan tablature“.

In 1981 Christopher Page cast doubt for the first time on the hypothesis of the primacy of the „German“ lute tablature with his discovery, in a treatise dated after 1375, of a diagram that could be interpreted as the earliest „French tablature“.<sup>18</sup> Page admits, in fact, that this presumed „French tablature“ might in some way be related to the theoretical alphabetic notation. Nevertheless the

<sup>18</sup> Christopher Page, „A French lute tablature in the 14th century?“, *Early Music*, 9 (1981) 488–92. The diagram examined is in US-Bu MS 774, p.51.

Venetian diagram of more than a century later gives some weight to the vague and uncertain emergence from the darkness of a notation that could connect theoretical alphabetic tradition with the later practice of lute tablature. Apart the German sources, the only surviving traces of lute notation before Petrucci are PES 1144 and BOL 596, which use French and/or Neapolitan systems, but not the zero system.

If we accept that the „French“ system was the first kind of tablature used in Europe for the lute, then the „Neapolitan“ one might be a simple translation of the previous system, brought into being by substituting a series of numbers in place of the letters of the alphabet. It is logical to connect A, the first letter in the alphabet, with 1, the first in the numeric series. For Western culture before 1500, zero was not yet considered a number and there is no equivalent for 0 in the alphabetic series. At some point, somewhere, the numerical series was preferred to the alphabetical, perhaps due to a developed interest in mathematics. It is very tempting to identify this site and this age with the Aragonese court of Naples during the last decades of the fifteenth century. Could it be just a mere curiosity that the only other tablature called „Neapolitan“, the late system for keyboard notation invented by the blind organist Antonio Valente about 1576, uses two series of numerals starting with 1, and the same occurs with Spanish keyboard tablatures? There is, however, no key on a keyboard instrument that is equivalent to the open strings of the lute, so zero is not necessary. The apparently illogically disposed „German lute tablature“ also starts with a series of five numbers for the open strings, without zero, and the top line indicates the first string, as in both „French“ and „Neapolitan“ systems.

Recalling all the elements of this discussion, Iberian territories before and after the Moorish expulsion in 1492 are the crucial points in our story. The invention of the lute tablature attributed to a Moor from Granada, already cited, corresponds in fact to a real diffusion of lute players and makers of lutes and strings of Moorish origin that, after the expulsion, came to different countries in the southern Mediterranean, including Naples. Similarly to the use of the numeric system in tablature, counting in Arabic numerals was still sufficiently a new practice in 1555, when Fray Juan Bermudo said:<sup>19</sup>

Poner quiero todas las maneras de cifrar que hasta oy han usado. Porque si las cifras hallare fuera del libro del author sin declaracion las entienda [...]. Tambien lo hago porque si el tañedor no se contentare de alguna destas maneras de cifrar: occasionado desto invente otra. No se avia de contentar el de buen entendimiento con lo que oye de su maestro sino trabaxar por si. No digo que condeneys las cifras viejas, que es invencion de buenos entendimientos: sino que, teniendo en mucho alos que las inventaron, han usado y conservado, tomen todos los primores que en ellas ay trabajando de poner mas, haciendo adiciones. Asi lo han hecho los que las cifras nos

<sup>19</sup> J. Bermudo, *El libro llamado Declaración de instrumentos musicales*, Osuna, 1555, f. cviiiv-cix. It is interesting for my discussion that Bermudo uses the term „contadores de guarismo“ instead of the usual Spanish term for „Arabic numerals“.

communicaron [...]. Conviene que todo discipulo de credito a su maestro si alguna cosa quisiere saber. Pero sobre lo que fu maestro le dixeret etudie, y imagine, y sobre todo pida a Dios complimiento de sciencia. Asi que, para occasionar a los estudosos tañedores que vayan adelante: porne las maneras de cifrar.

Tres diferencias de cifras he visto de las quales eneste tractare. Acerca de esta materia dos cosas ay que dezir. Una es commun, que atodas las cifras conviene; y la otra particular, que algunas compete. El que todas la cifras de vihuela ha de entender primero deve saber, que cosa es cifra.

Los contadores de guarismo usaron unas señales para en breve palabras contar gran summa. Siguiente las signales: 0.1.2.3.4.5.6.7.8.9. No tienen mas de estas señales, y bastan ellas solas para contar [...] En qualquier cuerda que hallardes el zero dize, que ha da ser tocada la tal cuerda en vazio. Algunos tañedores llaman en lleno a lo que yo nombro en vazio; y todos queremos dezir una cosa por diversos nombres [...].

It is very interesting to see that the Iberian Peninsula was the territory where national experiments of instrumental music notation were compared and mixed. The recently redescovered 1540 anthology of Baena, the earliest Iberian book of keyboard music, shows a very unusual mixture of „old German organ tablature“ (gothic letters) and so-called „Spanish tablature“, a short score having four lines corresponding to the vocal parts.<sup>20</sup> The first vihuela book published by Luis Milan in 1536, gives us further evidence about Bermudo's thesis on the existence of several and individual types of *cifras*. What is very important to note here is that Milan is the only Spanish vihuela composer to adopt the „inverted“ system of Italian tablature, with the *cantino* at the top of the staff, as in „Neapolitan tablature“.

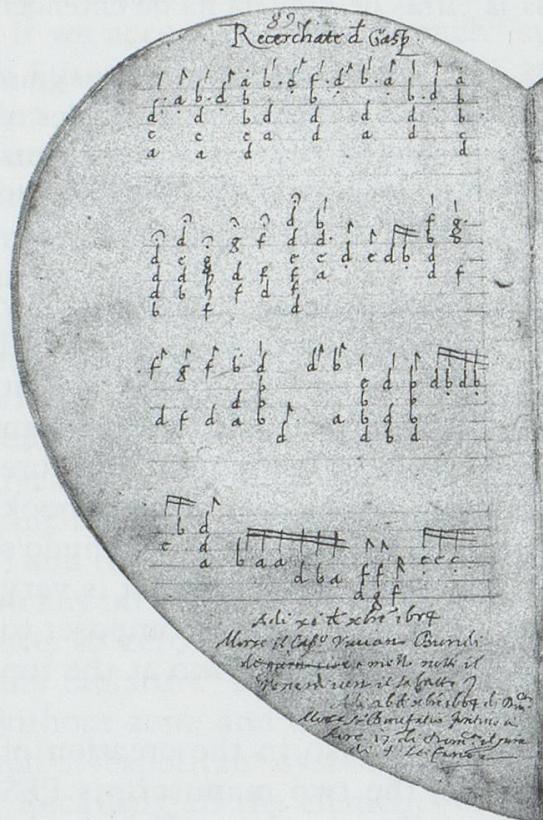
In my opinion, Naples occupies a central position also in the creation of the earliest known sources of Italian lute music, the two manuscripts PES 1144 and BOL 596. According to Vladimir Ivanoff and other scholars, the „heart-shaped“ manuscript (PES 1144) must be considered the earliest Italian lute source, even if the oldest portion of this composite codex is notated in „French tablature“. Ivanoff claims that PES 1144 was prepared and bound in the time of its copyist „A“, around 1480–90.<sup>21</sup> A later hand was responsible for the introduction of some pieces with attributed authorship: *Recerchate de Gasparo*. Ivanoff proposes to identify this Gasparo with a member of the Biondi family that, during the second half of the sixteenth century, owned the codex in the area of Fossombrone (which is the birthplace of Petrucci). A third hand („hand 4“ in Ivanoff's description) may have inserted, not before 1545–50, a few pages written out in „Neapolitan tablature“ and also bearing an attribution: *Recerchata de Antonio*. The principal owner of the manuscript,

<sup>20</sup> Gonzalo de Baena's *Arte novamente inventada pera aprender a tanger*, Lisbon 1540 only surviving copy has been discovered in Madrid; see Tess Knighton, „A newly discovered keyboard source. Gonzalo de Baena's *Arte nouamente inuentada pera aprender a tanger*, Lisbon 1540: A preliminary report, *Plainsong and Medieval Music* 5 (1996) 81–112.

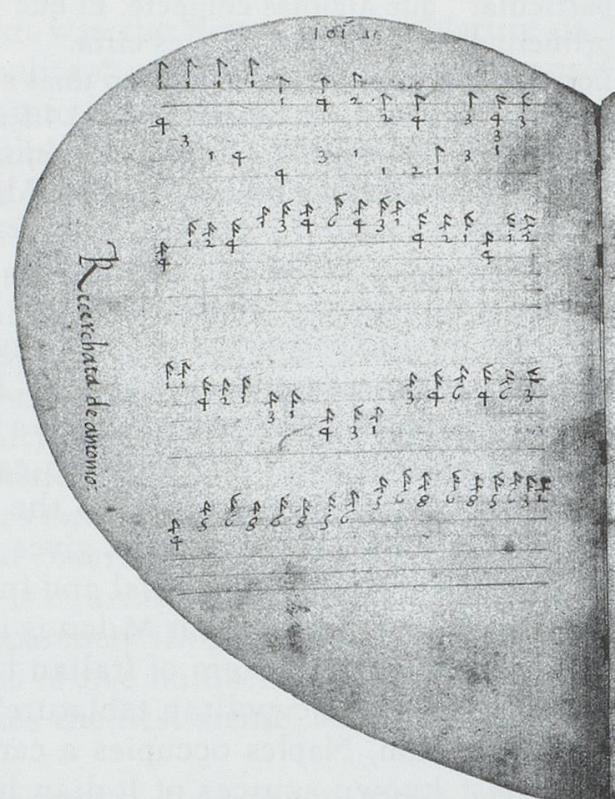
<sup>21</sup> Vladimir Ivanoff, *Das Pesaro-Manuskript. Ein Beitrag zur Frühgeschichte der Lautentabulatur*, Tutzing 1988, 31 ff., 81 ff.

Tempesta Biondi, seems to have copied at the end of the manuscript, not before 1550, a number of literary poems and some additional pieces for *lyra* in the rare „Italian tablature“ for the instrument (Plate 4 a-b).

Plate 4: Pesaro, Biblioteca Oliveriana, MS 1144:



a) Recerchate de Gasparo.



b) Recerchata de Antonio.

Ivanoff also proposes that the oldest part of the manuscript in „French tablature“ must have been copied from an earlier source no longer extant, written possibly in „Italian tablature“, because the presence of many mistakes in the position of letters. In fact, Ivanoff has perhaps placed too much trust in Sultzbach, the printer of Francesco da Milano's Neapolitan 1536 edition, who claims to have invented „Neapolitan tablature“, a system never used before. Consequently, Ivanoff proposes that the pieces in Neapolitan tablature must have been copied into PES 1144 manuscript after 1536, most likely at the same moment as Biondi inserted the *lyra* pieces.<sup>22</sup>

On the other hand, Ivanoff could not anticipate the dating of the BOL 596 fragments in „Neapolitan tablature“ and their content which clearly indicates a period around 1500. To justify his argument, he quotes a footnote from David

<sup>22</sup> Vladimir Ivanoff, *Eine Zentrale Quelle der Frühen italienischen Lautenpraxis. Edition der Handschrift Pesaro, Biblioteca Oliveriana, MS. 1144*, Tutzing 1988, XVII–XVIII, XXII–XXIII.

Fallows' article on the Bologna manuscript which notes that the Biblioteca Universitaria of Bologna preserves only a late 1560 reprint of the original printed book and assumes that it was from this, rather than an earlier source that no longer survives, that the eighteenth-century librarian separated the musical fragments.<sup>23</sup> Ivanoff thus dates the „Neapolitan tablature“ as after 1560. In my opinion there is no reason to postdate BOL 596 by some seventy years in order to justify Sultzbach's claims concerning his „invention“ of „Neapolitan tablature“ in 1536. I agree with Fallows and Atlas in dating the Bologna fragments before 1500, in the context of the Aragonese court of Naples.<sup>24</sup> In fact, the fragments are probably not an extract from any lute book but musical examples to be inserted in a treatise on music. This interpretation can explain the correspondence between figures and alphabet notation and the mixture of different elements: an organ piece with a key to letters, a vihuela tablature, and a prayer.

The style of the few pieces in „Neapolitan tablature“ in PES 1144 (*Recerchata de Antonio*) is not so distant from those in „French tablature“, and there is little evidence to justify a gap of more than half a century between them. On the contrary, the titles of *Rerchate de Gasp.* and *Recerchata de Antonio* are likely to be written by the same hand. These pieces are copied in subsequent sections of the source. Ivanoff suggests that Gasparo and Antonio were members of the Biondi family, but the same names are quite common among late fifteenth-century musicians, in particular at the Aragonese court of Naples (Gaspar von Weebrecht, Antonio Sigarra, etc.),<sup>25</sup> and the place of copying is also suggested by the spelling of „recerchata“, a form typical of sixteenth-century Neapolitan books (Ortiz, Valente, Rodio). PES could be a copy in „French tablature“ from an earlier source notated in „Neapolitan tablature“, a very easy translation from one system to a similar one (A = 1, B = 2, etc.). The copyist for some reason forgot to translate two pieces after Gasparo's ricercars, copying them as in the original source, and then returned immediately to „French tablature“. My hypothesis implies that the „Neapolitan system“ was the only one used in Italy before 1507, the date of the earliest appearance of „Italian tablature“. Why did Petrucci not use it and why did he decide to introduce another, previously unknown system?

To understand this decision, we have to return to the point of departure. There are two undeniable facts: the Arabic origin of the European lute (from the *ud'*) and the Arabic origin of the numbers used in modern mathematics

<sup>23</sup> Ivanoff, *Das Pesaro-Manuskript*, 16-17.

<sup>24</sup> David Fallows, „15th-century tablatures for plucked instruments: A summary, a revision and a suggestion“, *Journal of the Lute Society of America* 10 (1977) 18-26; A. Atlas, *Music at the Aragonese Court of Naples*, Cambridge 1985, 124-25, 150-51.

<sup>25</sup> See Atlas, op.cit., „List of singers and chaplains“ (88-97) and „Music for secular entertainment“ (104-113); Dinko Fabris, „Il compianto per il perduto splendore artistico musicale della corte aragonese in un manoscritto napoletano del primo Cinquecento“, *Trent'anni di ricerche musicologiche. Studi in onore di F. Alberto Gallo*, ed. by P. Dalla Vecchia and D. Restani, Rome 1996, 305-321.

(that are not called „Arabic“ by chance). The Arabic number series was introduced in Europe during the thirteenth century and replaced the mechanical way of calculating on the *abacus*. The Arabic series already included the zero, even if the oriental theorists indicated it as a mere point. at the end of the series of the numbers 1 to 9, for the corresponding sign 0 was already assigned to the future number 5. The sign for zero was named *zephir*, the root of the European words *zipher*, *cifra*, *chiffre*. It is interesting that each of these words indicates not only zero but also the entire series of numbers (1 to 10) and also the system of notation using numbers, tablature.<sup>26</sup>

The most interesting consequence of the introduction of Arabic numerals in early-modern Europe was the rapid development of mathematical operations. The speedy and easy way to calculate with numbers was considered a danger both for religion (because of the Arabic origin of this system) and for business activity. The 0, in particular, could have changed easily into 6 or 9, a big problem for the security of bankers, the Italians in particular. No few cities – for example, Florence in 1299 – forbade in their statutes and in official account books the usage of Arabic numerals and, in their place, Roman numerals were used or numbers were entirely spelled out in words. But at the end of the fifteenth century, the expulsion of the Moors from Spain had the unforeseeable effect of disseminating experts in Arabic mathematics throughout Europe and the process was irreversible.

The number most important for us is zero: it seems that in 1491, for the first time in Europe, zero was used not only as a sign but also as a true number. A few years later, in 1494, Fra Luca Pacioli published his famous book describing the „partita doppia“, the new system to calculate largely adopted by Venetian merchants, in which zero played a central role in the balance between „in“ and „out“.<sup>27</sup>

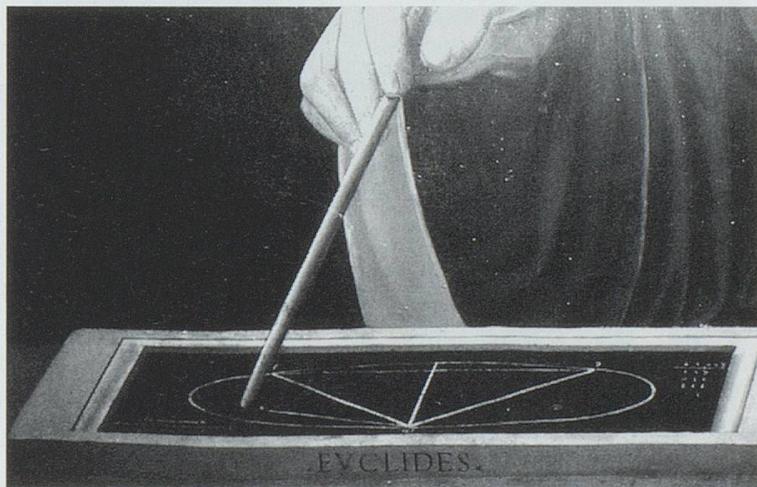
Ottaviano Petrucci decided to start his new venture in printing solo-instrument music with an illogical system, in which zero is inserted at the beginning of a series of numbers and without any correspondence to the systems of tablature already in use. In addition, he reversed the diagram of the six strings

<sup>26</sup> See Juan Vernet, *La cultura hispanoarabe en Oriente y Occidente* [1978], french transl.: *Ce que la culture doit aux Arabes d'Espagne*, Arles 1985, 72–76. It occurs in particular in Spain, but also French players say „dechiffrer la tablature“, while in Italy words like „cifra“ and „cifrario“ indicated a secret code to translate into numbers the normal writing with alphabets. A situation very similar to first scribes copying tablatures from one system to another one. It is not by chance that many lutenists during the Renaissance were also active as spies and familiar with secret writing codes.

<sup>27</sup> See Luca Pacioli, *Trattato di partita doppia*, Venezia 1494, critical ed. by A. Conterio with introduction and commentary by B. Yamey, Venice 1994. Pacioli was very famous and active in the Aragonese court of Naples in 1491 before moving to Venice in 1494 where he published also a *Summa de arithmeticā geometriā proportioni et proportionalitā*, Venice 1494. In his last work, *De Divina Proportione* (MS c.1496 dedicated to Ludovico Maria Sforza in Milan), Pacioli lists among the common signs: „N°, cioè numero, numeri per 0 o per i che sieno“ (mod. ed. Milan 1956, p.20).

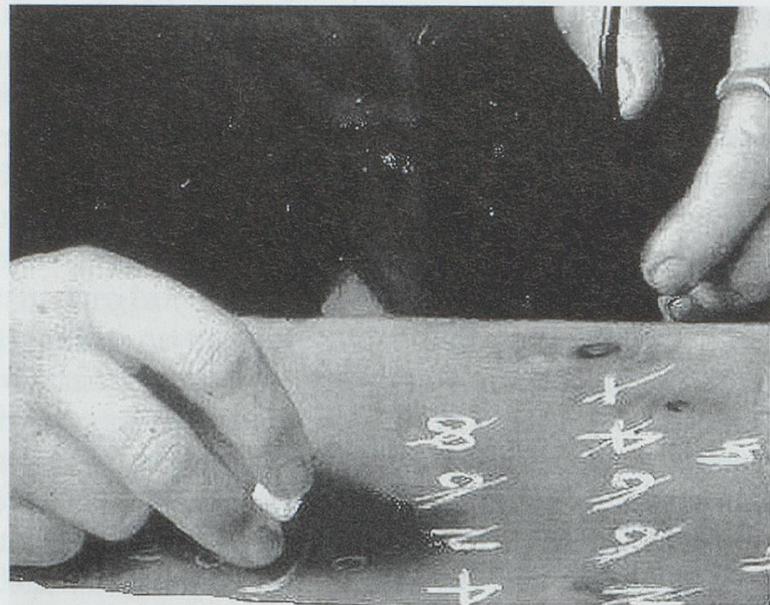
of the lute that until now, in all other systems were connected to the player's observation point and not to the reader's. The neck of the instrument reproduced by Petrucci's system is the same that results from playing in front of a mirror. In other words, in 1507 Petrucci invented a completely new system, in which zero is considered a number and the first in the series. This would not have been possible before 1500. In the last decade of the fifteenth century, the decisive battle broke out between „abacists“ and „algorists“, between those who computed on the abacus and those who computed by algorisms.<sup>28</sup> The victory of the latter was determined by the positive effects on business of easier and speedier calculation by numbers. This event occurred at the very beginning of the sixteenth century. An early Renaissance encyclopaedia of scientific and alchemic knowledge underlines the victory of algorisms and the functional usage of zero as a number: In the first edition of Gregor Reisch's *Margarita philosophica* (Freiburg 1503), there is an engraving showing „Arithmetica“ as a lady bearing a vest full of symbols, indicating Boethius as the winner in the competition with Pythagoras, the latter computing on the abacus. In the portrait Boethius indicates zero among a series of numbers written on his table. This scene recalls the portrait of a man indicating the zero on the table by Barthel Beham. (Plate 5b and 6a).

Plate 5:



a) Detail from the portrait of Luca Pacioli, dated 1495, by Jacopo de' Barbari [Venice 1460/70–1521] (Napoli, Gallerie di Capodimonte).

<sup>28</sup> To clarify the early usage of these words in mathematics see Robert Recorde, *Grounde of artes* [c.1542]: „Some call it Arsemetrick, and some Augrime ... Both names are corruptly written: Arsemetrick for arithmetick, as the Greeks call it, and augrime for algorisme, as the Arabians found it.“ (Cited in the article „Algorithm (Algorism)“, *Encyclopaedia Britannica*, Chicago etc. 1963, I, 629. See Vernet, op.cit., 75–76; *Uomini e numeri*, ed. by E. Picutti, special issue of *Le scienze. Quaderni* 18 (1984); S. K. Heninger, *Touches of sweet harmony. Pythagorean cosmology and Renaissance poetics*, San Marino, Ca. 1974, 86–90; G. Ifrah, *Les chiffres ou l'histoire d'une grande invention*, Paris 1985, chapter „O“ [sic!].



b) Detail from a portrait of a man by Barthel Beham [Nürnberg 1502–1540] (Wien, Kunsthistorisches Museum).



Plate 6 a) „Typus Arithmeticae“, woodcut from Gregor Reisch, *Margarita philosophica* (Freiburg 1503), f.1v.



Plate 6 b) „Typus Musicae“, woodcut from Gregor Reisch, *Margarita filosofica* (Freiburg 1503) f. h 3.

I have checked the first translation into Italian of the *Margarita filosofica*, that was published in Venice in 1600. Here the zero is perfectly accepted in the series of numbers:<sup>29</sup>

*Figure de i numeri.*

Scolaro: Che cosa è numerare?

Maestro: è una artificiosa representatione di qualunque numero per figure convenienti.

S.: Quali sono queste figure convenienti?

M.: Sono queste: I, significa uno; 2, duoi; 3, tre; 4, quattro; 5, cinque; 6, sei; 7, sette; 8, otto; 9, nove, & 0, la qual figura è detta nulla, o cifra, percioché per quella sola non viene representato niente, essa nondimeno occupando alcun luogo, darà forza di significare alle altre, come 20: ivi il 2, significa vinti, & nondimeno separato significa solo duoi [...].

<sup>29</sup> Gregor Reisch, *Margherita filosofica del reverendo P. F. Gregorio Reisch, nella quale si trattano con bellissimo, & breve metodo non solo tutte le dottrine comprese nella Ciclopedia degli antichi, cioè Cerchio, over Rotolo delle Scienze, ma molte altre ancora aggiuntevi di novo da Orontio Fineo Matematico Regio, tradotta novamente dalla lingua latina nell'italiana da Giovan Paolo Gallucci* (Venice 1600), „Dei principij dell'Aritmetica Pratica. Del Numero“, Cap. IV: „Del numerare“, pp.242 ff. The woodcut appears only in the first edition, Freiburg 1503, f. 1v, in one with the other „Typus musicae“, f. h3 (see Plate 7).

We could search in the history of mathematics for the origin of Petrucci's „invention“, either depending on his contacts with Venetian merchants already using zero as a new number, or depending on individual habits to write tablatures by professional lute players of his circle, such as Spinacino, Dalza, Bossinensis or Marco dall'Aquila. The last of these is an interesting candidate, not only because the mystery of his never used Venetian privilege of 1505,<sup>30</sup> but also for his contacts with the area of Petrucci's birthplace, to which also PES 1144 is connected.

In conclusion, I can affirm that the first type of „Italian tablature“ was the „Neapolitan“, that it remained in use until the middle of the seventeenth century, but limited to the Neapolitan territories. The new „Italian tablature“ with zero, the invention of Petrucci, was soon widely diffused thanks to the series of six prints published in Venice and Fossombrone in the five years 1507–1511. Amateurs and professional lute players adopted the new system quite soon, as shown by such sources as THIB and CAP: these and all other sources written out in „Italian tablature“ were produced after 1507.<sup>31</sup> As Bermudo says, any lute virtuoso and teacher had his own favorite *cifra*, until Petrucci imposed his new system to the entire world of sixteenth century lutenists.

<sup>30</sup> See Brown [1505]1 and Martin Kirnbauer's article in this volume.

<sup>31</sup> The current datation for the Thibault MS until now was ca. 1505 (as referred to in the facsimile edition, Geneve 1981). Indipendently from my deductions (enlarged in my paper for the Petrucci conference in Venice cited in the footnote 12), William Prizer has established a dating of the MS not before 1510. I am grateful to Prof. Prizer for this information.