

The musical notation - a path of interdisciplinary knowledge and development

Iliana VELESCU¹

Abstract: *The music education is an activity that in certain places, schools or cities from Romania is done more or less, sometimes not at all. The music education systems are known especially in Western Europe, and I refer mainly to Montessori, Kodaly, Dalcroze or Orff proved to be extremely efficiency in acquiring basic musical skills. These consist in a quickly learning of a correct intonation, keeping a steady beat or tapping different rhythms from simple to complex, associating sounds, rhythmical beats, harmonies with body movements and even performing songs on various percussion instruments. The most specialized studies in the field of musical pedagogy confirm that the stage of musical notation should be equivalent to that of the school period. The acquisition of symbols that designate notes and durations should be done when the child begins to write and read. And I would not contradict this approach at all. However, there are situations when some children are familiar from an early age (four, five years) with a musical instrument. And reading a musical score becomes sometimes quickly or inevitably a necessary condition for learning a musical instrument. The present study aims to approach this topic and identify the intellectual benefits.*

Key-words: *music education, music notation, pedagogy, music teaching*

1. Introduction

The concept of musical notation can be seen as a language of communication between musicians but also as a system of memorizing and teaching music through syllables, letters, words or spoken expressions. The origin of written signs derives from their very form. Musical notation arose from the need for communication of literary societies. Even today, there are indigenous peoples of the African continent (especially in the sub-Saharan Africa) who have not yet developed a strict musical notation². They communicate about music through syllables, word patterns, the number of xylophone plates, or the names of the strings. In fact, in Europe of the eleventh-century the instrumentalists did not yet have a notation system, and the church musicians communicated mainly through syllables and hand signs, rather than by reading a score in rehearsal or concert.

The development of musical notation was influenced by verbal language and the formation of a conventional script. Some cultures, such as China, Japan, Korea and Europe, have shown an interest in the development of notation systems since antiquity, which served even more purposes. Other peoples, however, developed very few systems, even until the end of the 19th century, especially the countries of the Middle East (except Turkey), South and Southeast of Asia.

The use of a notation system and the acquired form is the result of the social and cultural context in which it was developed. As an observation, it is interesting to note that in Western Europe it was the vocal music that first acquired a written notation, while in Greece, Mesopotamia and the ancient Egypt, the instrumental music was the one that required a notation. In the latter two cultures, and in later instrumental notations from East Asia, the

¹ Faculty of Arts of the University "Ovidius" from Constanta, email address (ion.popescu@univ-ovidius.ro).

² Ian D. Bent/David W. Hughes, Robert C. Provine, Richard Rastall (I–II, With Anne Kilmer I, 2). 1980. „Notation” I. In *The New Grove Dictionary of Music and Musicians*, edited by Sadie Stanley. Macmillan (6th ed. of the Grove Dictionary), vol.13, p. 347 - 349.

script of the language was used as part of the notation; in the former, as in the song notations of Byzantium and Eastern Europe, Tibet, Mongolia, and Japan, the non-linguistic symbols were used, and the script was necessary only for the sung texts. Moreover, some notions are designed to provide all the necessary information, and others provide only a small part of what would be needed by those who are not followers. In the latter, the remaining information is stored either because it is already learned and therefore useless, or because there is a desire to keep it secret. It is considered that the need for a notation system arose for two reasons: as a landmark for memory and the need to communicate, to express, to reproduce music written by someone else. From a memory perspective, it allows the performer to encompass a much larger repertoire than they might otherwise retain and achieve. It can help the memory of the performer in the already known music, but a perfect memory is possible only by the existence of a written form. It can provide a framework for improvisation, or it may allow to read a music at first sight (the latter concept is predominantly Western); also, a written notation provides tools to sketch and write musical ideas during the composition process.

The second point of view – as a way of communication - keeps the music for long periods of time; offers the possibility of interpreting scores whose composers are at distant geographical and temporal distances; provides the performer with a set of symbols (graphic and spatial) to achieve certain effects during the performance; presents music as a “material” for study and analysis and provides the student the means to reproduce when the performance is not possible; and serves to the theorist as a medium through which to demonstrate musical or acoustic laws.

2. The first music notation systems

A first representation of a system of musical notation obviously belongs to ancient Greece, by arranging the alphabet in groups of three letters, thus specifying the semitones and quarters of tone and indicating the seven notes of the three types of scales: diatonic, chromatic and enharmonic. In the 19th century, the theorist Heinrich Bellermann (1832-1903) and the philosopher Karl Fortlage³ (1806-1881) discovers this system and explains in the work *Das musikalische System der Griechen in seiner Urgestalt: aus den Tonleitern des Alypius* (1847) the notations made by the ancient Greeks Alupius, Aristide, Nichomachus, Ptolemy and Gaudentius. A first use of Latin letters for the representation of the notes is found in the writings of Boetius (A. D. 500). It is then followed by the emergence of a system of signs called neume, derived from signs specific to Greek accents. Thus, Latin letters began to be used to represent the steps until the advent of the system introduced by Guido d'Arezzo in the 11th century by adding lines to neume, leading to the invention of the staff.

Naming and writing musical notes began to be used initially for instruments before the voice and this is naturally justified by observing the childhood games: a very young child will learn to sing a song by imitating the voice of adults. The same child will be able to learn easily to sing *by ear* rather than playing an instrument *by ear*.

F. A. Gevaert points⁴ out that the musical notation systems known to this days can be divided into two groups:

The first - which includes Chinese, Hindu, modern Arabic, Gregorian, ancient Greek and tonic sol-fa systems, calls these systems phonetic because the sounds are represented by the letters of the alphabet, arithmetic figures or short words.

³ Stefan Hagel. 2009. *Ancient Greek Music History: A New Technical History*, Cambridge University Press. Retrieved April 10, 2020, from

<https://books.google.ro/books?id=WxHhdrPkPrUC&pg=PA9&lpg=PA9&dq=fortlage+music&source=bl&ots=8wz92IgrRaC&sig=ACfU3U3c3kPnhV80MZuLZ516aihqsedlmg&hl=ro&sa=X&ved=2ahUKewjstNigx4vpAhUPLewKHZ>

⁴ C. F. Abdy Williams, 1903, *The story of Notation*, London, New York, Charles Scribner's Son, p. 34, in <https://babel.hathitrust.org/cgi/pt?id=hvd.ml1q3i&view=2up&seq=34>.

The second group is represented by graphic signs (the association of signs positioned above or below with their intonation) and is called diastematic (a term that comes from the Greek language and means an interval). To this group belongs the liturgical Hebrew, Byzantine or Armenian notation systems, the neums of the ancient church and the ultimately system which is a combination of graphic and phonetic signs.

Since the 16th century, frequent attempts have been made to build simple systems of vocal notation, some even based on the practice of solmization, dedicated to those who do not have deep musical knowledge. Many of these indicate the redundant tone in two different ways: by *mensural*⁵ notation complemented by some corresponding pitches symbols, either in letters, either in syllables, or with distinct shapes or numbers representing the solmization syllables. These systems have multiplied since the eighteenth century, where a musical literacy was sought or in research areas associated, especially with well-known music (hymns, psalms, ballads, etc.).

Pierre Davantes (1521-1526) tried to develop a simplified notation (a solmization with added numbers) presented in his book published in 1560 in Geneva, *Pseaumes de David, Nouvelle et facile methode pour chanter chacun couplet des pseaumes sans recour au premier*. Its notation consists in a representation of the notes by numbers (from 1 to 9) completed by the letters A and B and arranged in an ascending sequence that can begin with E, C or B. The solmization systems were not yet very common in England either. The *Fasola* system, later known as the “*Lancashire sol-fa*”, used a small number of solmization syllables; it was exhibited in publications from the early 17th to the end of the 19th century, such as Charles Butler's *The Principles of Musik* (1636) or *Breefe Introduction to the Skill of Musick* by John Playford⁶.

In America, these ideas inspired the creation of various notation systems for hymn and psalm books, such as the one initiated by John Tufts, *An Introduction to the Singing of Psalm-Tunes*, 1721 in which the letters M, F, S and L (for the solmization syllables - Mi, Fa, Sol and La) are placed on a conventional staff, with additional dots for the duration signs (two dots for the short duration, one for the semi-breve and none for the minim). Most 19th century systems are largely based on it. In some areas of the USA (the southern and western states) a number was accompanied by a note of a different format (the notes were of four different shapes, each representing one of the four *fasola* syllables);

Since the 17th century, several notation system based on numbers have been proposed as alternatives or substitutes for conventional mensural notation. One of these belongs to William Braythwaite (*Siren coelestis*, 1638), which include comprising numbers for notes and various different types of commas for pauses; other early numerical systems are those of Kircher (*Musurgia universalis*, 1650) and that of Giovanni d'Avella (*Regole di musica*, 1657)⁷. Such systems from the 17th century and later relied primarily on numbers, with or without letters of the alphabet, and some of these used conventional rhythm signs to fix the duration of notes; most used numbers to count arithmetically the diatonic intervals in a given note or notes. An exception is Mersenne's proposal (*Harmonicorum libri XII*) to represent notes by an inverted ratio of intervals, calculated by the length of the string required to produce the note, rather than by frequency;

In Europe, J.J. Rousseau uses in his work *Projet informations de nouvelles signes pour la musique* (1742) the numbers from 1 to 7 for the diatonic scale of C major placed either on lines, or above or below to specify the octaves register. Another system used, distributed with

⁵ The term is known also as measured music. It is part of the European notation system used between 1260 and 1600. In this notation, the ligatures between neumes were given up, introducing the notes and the rhythmic notation as precise as possible.

⁶ David Hiley. „Notation” III. 1 (vi) in *The New Grove Dictionary of Music and Musicians*, pp. 348 - 349.

⁷ David Hiley. 1980. „Notation” III, 1 (vi) in Sadie, Stanley (ed.). *The New Grove Dictionary of Music and Musicians*. Macmillan, (6th ed. of the Grove Dictionary), vol.13, pp. 348 - 349.

lines used dots above or below numbers indicating the octave register presenting only the first note in the new register. Simple numbers were used to specify the time signature rather than conventional fractional signatures; the subdivisions of a bar, if unequal, were indicated by commas and horizontal lines above or below groups of notes, functioning as bundles in the notation of the measure. Rousseau's notation proposals, although not adopted at the time, were taken on a relatively large scale in nineteenth-century France by the Galin-Paris-Chev  method, whose influence extended to other European countries (Germany, the Netherlands, Denmark and Russia).

The most important of these systems was the Tonic Sol-fa system, perfected by John Curwen. He was inspired by a method of singing (solfeggio at first sight). The Sol-fa Tonic system has resized the staff and the forms of conventional notes, using letters as abbreviations of syllables representing the degree of the major scale and with vowel changes next to the letters to indicate the accidentals. The system is also completed with the use of phonomymic signs with a device known as a *Modulator* (a graph showing the initials of the notes arranged vertically) taken from Sarah Glover - *Norwich sol-fa ladder* - and adapted by Curwen). For an easy accessibility in learning notes, the use of signs for durations and the number of time signature is avoided.

This simplified system has been well assimilated and integrated into the study of vocal music. Developed in England, in a not very strict way, it was easily adapted to other countries, such as Germany and Poland. The versatility of this system made it accessible and widely used in the 20th century by many musicians from various continents.

Hermann von Helmholtz (1821-1894) an illustrious physician and physicist interested in acoustics and sound perception considered that this method is extremely beneficial with reliable results for singers in producing and verifying the intonation. However, in the case of musical works with numerous modulations or in the case of atonal works, this system proved to be limited and difficult to apply. Other systems of solmization with more than seven syllables and exceeding one octave have not been successful (like Eitz method, or the Douzave system of J. L. Acheson) thus returning to the conventional mensural notation.

3. Other music notation systems

The need to record a musical work led to another means of writing. Inspired by the ancient stenographic systems mentioned in Diogenes' work where it is recorded, he recalls that even more than 100 years before him, Xenophon used to use shorthand to transcribe the speeches of Socrates. The first attempts at musical shorthand were recorded in France in the early 18th century - with the work of Joseph Sauveur, *Principes d'accoustique*, 1701, although there are other older or later systems that relate to either alphabetical or conventional⁸ systems, such as *St nographie musicale* by J. L. Riom, 1833 which used various geometric signs – like dots, curved lines, etc.

Like musical shorthand, the music notation systems for the blind it was also developed in the 18th century. Among the first attempts are noted the works by Jean-Philippe Rameau - *Code de musique pratique*, 1760 or William Tans'ur - *Elements of Musick*, 1772 but the most important method was the one conceived by Louis Braille (*Anaglyptographie*, 1829) which was completely different from conventional signs. The embossed dots (three each) were arranged in two adjacent vertical rows, with four upper dots for pitch and two smaller ones for durations.

Sometimes, the music notation systems served also as a means of encoding certain musical messages, such as themes or the names of composers. It seems that the first attempts

⁸ David Hiley. „Notation”. III. 1 (vi)' in *The New Grove Dictionary of Music and Musicians*, pp. 348 - 349.

are recorded in the 9th century, although many of them flourished in the Romantic period. Musical encodings generally use syllables or letters derived from solmization. The BACH motif is perhaps best known to some of us, but composers such as Schumann (A, S, C, H), with their own coding system, Schubert (F, S, C, H), Brahms (Bb, A, B, Eb) Shostakovich (D, S, C, H) are just a few of the composers who used this type of music coding.

4. Learning score notation - scores with classical, traditional language and modern scores for choir and instruments.

The improvement of the notation of the scores for the instruments with keys is also reflected in the adoption of some indications of pressing the keys and they are regularly found in the 19th century, especially in tabulations; it is occasionally founded in the 16th century in other instrumental genres. The piano music of the 19th century underwent two distinct influences: a *continental* one - comprising a full fingering from 1 to 5, and an *english* one with a special sign (“+”) for the thumb and numbers from 1 to 4 for fingers. The latter system, now replaced by the former, was used until the 20th century. The use of the pedal in piano music has been highlighted since the early 19th century by various special signs. Also, during this period, comparable instructions for mechanical and physical actions are multiplied, in order to produce special effects of several types for stringed instruments or wooden wind instruments.

5. Conclusions

The presentation of some of the music notation systems, without pretending to exhaust the subject, is rather an urge for young teachers to focus on the diverse range of musical notions (symbols, signs, letters, dots, colours and various shapes). Over time, the purposes of implementing a notation system varied from one function to another - the desire for literacy, memorization / recording, knowledge, taking over and adaptation, coding and last but not least, the didactic function, of learning.

Each of the notation systems set out above, from the ancient to the present, without excluding the writing systems of John Cage, George Crumb or others have important features, both visually - graphically - and cognitive. Therefore, in the present day, when teachers from around the world are challenged by the assault of social, media, economic factors, or by the application of some educational reforms, the quality of the didactic and pedagogical act can undergo essential changes with a negative impact. The alternative of implementing new systems or pedagogies is welcome at any time, but it also takes time and an evaluation of the results obtained. Approaching traditional systems through a creative vision but adapted to the current needs of society can also be a reliable alternative.

In teaching, either we address those who study music as a basic specialty in terms of performance (vocal singing or learning an instrument) or we address those who only want a development of musical knowledge (music education classes in schools or singing / playing an instrument in a private system) we often resort to certain learning principles, generally valid in any discipline but especially in learning a foreign language: listening, speaking, reading, writing, extended by association with hearing/audition, singing, reading scores, writing scores (dictation).

Therefore, regardless of the approved category (amateurs or professionals) these principles are applied, they support inequalities in certain situations. In the case of professionals, learning inevitably relies on the four stages, but in the case of amateurs, some may be delayed, rarely avoided (such as hearing for the hearing impaired, or reading for the visually impaired).

Investigating these notation systems brings a huge benefit of knowledge needed by any teacher. Knowing the historical and particular evolution of notation systems, we can constantly improve current methods or innovate original methods or teaching systems. There are many studies that support the intellectual benefits acquired by studying an instrument or by any constant musical activity. It is known that music improves memory, develops vocabulary, language, imagination, creativity, self-confidence, disciplines (through the constant study program), facilitates learning through the *transfer effect*⁹, it helps to achieve personal satisfaction of fulfilling goals (by learning a repertoire) and is an excellent way of emotional development. And since music can be studied from the youngest to the oldest ages, regardless of the proposed method, the approach of musical notation only stimulates the development of thought processes indispensable to the person who tends towards education and beauty.

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⁹ Iosif Csire. 1998. *Educația muzicală din perspectiva creativității*, București: Universitatea de Muzică, p. 40.