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## Alois Hába's Microtonal Systems and Their Practical Use in Selected String Quartets

### Abstract

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Alois Hába (1893–1973) was one of the most important composers developing the microtonal music in the early 20th century. The list of his works contains many pieces that were composed in quarter-, 1/5- and 1/6-tone systems. In 1927 he published the book titled *Neue Harmonielehre*, in which he described the innovative harmonic systems using 1/3, 1/4, 1/6 and 1/12 part of tone.

The article briefly presents Hába's life and work and focuses on the composer's harmonic ideas from *Neue Harmonielehre*. The theory of microtonality is confronted with the compositional technique through the analysis of four Hába's string quartets: *2nd Op. 7*, *11th Op. 87*, *14th Op. 94* and *16th Op. 98*. The analysis focuses on the aspects of microtonality: notation, vertical and horizontal use of new microtonal intervals and texture.

### Keywords

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Alois Hába, microtonal music, *Neue Harmonielehre*, string quartets

Alois Hába's (1893–1973) output, if known to the listeners, the most frequently is the symbol of quartertone music. Among 115 works published with opus number (103 opuses and twelve “versions” of the compositions marked in the catalogue with the additional letters) and six works without opus number, the microtonal work comprises about half of it (60 works)—47 quartertone works, twelve in the system of  $1/6$  tone and one in the system of  $1/5$  tone. Compositions in microtonal systems are the most recognisable part of his output. Identifying Hába with microtonality also results from his active engagement in teaching new harmonic systems through classes at the Conservatory and numerous theoretical works.

The persona of Hába should not be entirely unknown to Polish readers as his name appears in several publications—among others in *Leksykon kompozytorów XX wieku* by Bogusław Schaeffer<sup>1</sup> and *Encyklopedia Muzyczna PWM*.<sup>2</sup> There is also a Polish monograph of the composer—*Alois Hába* by Zbigniew Kościów,<sup>3</sup> which due to limited content and popular style, visible e.g. in the lack of footnotes, is an insufficient source of knowledge of the life and art of this Czech composer. In Polish music press three interviews with Hába were published, conducted by Bohdan Pilarski in 1958,<sup>4</sup> Józef Kański in 1961<sup>5</sup> and Bogusław Kaczyński in 1973.<sup>6</sup> Hába's harmony, based mainly on the semitone system, is the subject of Antoni Poszowski's considerations, which he described in the works: *Tworzywo dźwiękowe „nowej harmonii” Aloisa Háby*,<sup>7</sup> *„Modalność rozszerzona” Aloisa Háby*<sup>8</sup> and *Tworzywo dźwiękowe koncertu skrzypcowego op. 83 Aloisa*

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1 B. Schaeffer, *Leksykon kompozytorów XX wieku*, Kraków 1963, pp. 205–208.

2 M. Gołąb, *Hába, Alois*, [in:] *Encyklopedia Muzyczna PWM. Część biograficzna*, Vol. 4 (HII), E. Dziebowska (ed.), Kraków 1993, pp. 3–4.

3 Z. Kościów, *Alois Hába*, Wołomin 2003.

4 B. Pilarski, *Alois Hába w kręgu swych wspomnień*, “Ruch Muzyczny” 1958, No. 21.

5 J. Kański, *Z Aloisem Hába przy kawie*, “Ruch Muzyczny” 1961, No. 18.

6 B. Kaczyński, *Jubileuszowa rozmowa z Aloisem Hába*, “Ruch Muzyczny” 1973, No. 16.

7 A. Poszowski, *„Modalność rozszerzona” Aloisa Háby*, [in:] *Muzyka czechosłowacka XX wieku. Materiały z sesji*, J. Krassowski (ed.), Gdańsk 1974.

8 *Ibid.*

*Háby*.<sup>9</sup> The most detailed foreign publication devoted to Hába is a monograph *Alois Hába. Život a dílo*,<sup>10</sup> written by the most important biographer and researcher studying the output of the Czech composer, Jiří Vysloužil, and published in 1974. It is accessible only in Czech, but the author attached the long summary in German. More recent data about Hába are provided in analyses prepared by two Czech composers, presently working at the Center for Research on the Works of Alois Hába at the Masaryk University in Brno—Vlasta Reittererová<sup>11</sup> and Lubomír Spurný<sup>12</sup>—who also publish their articles also in German and English. One of Spurný's texts was published in Polish in the journal "Glissando".<sup>13</sup> In English- and German-language literature there are also examples of works written by non-Czech researchers, who study the phenomenon of microtonality in Hába's output. Among them, there are doctoral dissertations by Suzette Mary Batta *Alois Hába's "Neue Harmonielehre des distonischen, chromatischen, Viertel-, Drittel-, Sechsten, und Zwölftel-Tonsystems"*,<sup>14</sup> being the English translation of the most important theoretical treatise written by

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- 9 A. Poszowski, *Tworzywo dźwiękowe koncertu skrzypcowego Op. 83 Aloisa Háby*, "Zeszyty Naukowe. Państwowa Wyższa Szkoła Muzyczna w Gdańsku" 1977, No. 16.
- 10 J. Vysloužil, *Alois Hába. Život a dílo*, Praha 1974.
- 11 V. Reittererová, *Die Opern von Alois Hába. Ein neues Phänomen des Musiktheaters im 20. Jahrhundert*, "Musikgeschichte in Mittel- und Osteuropa. Mitteilungen der internationalen Arbeitsgemeinschaft an der Technischen Universität Chemnitz", Chemnitz 1998, No. 3, pp. 177–197, [https://www.gko.uni-leipzig.de/fileadmin/user\\_upload/musikwissenschaft/pdf\\_allgemein/arbeitsgemeinschaft/heft3/0323-Reiterer.pdf](https://www.gko.uni-leipzig.de/fileadmin/user_upload/musikwissenschaft/pdf_allgemein/arbeitsgemeinschaft/heft3/0323-Reiterer.pdf) [accessed: 10.06.2017].
- 12 L. Spurný, *Was ist neu an Hábas »Neuer Harmonielehre«?*, "Zeitschrift der Gesellschaft für Musiktheorie" 2007, No. 4/3, pp. 323–328, <http://www.gmth.de/zeitschrift/artikel/264.aspx> [accessed: 20.05.2017]; V. Reittererová, L. Spurný, »Musik am Rande«. *Einige Bemerkungen zur Typologie der Musik von Alois Hába*, "Muzikološki zbornik", Ljubljana 2011, No. 47 (1), pp. 153–165.
- 13 L. Spurný, *Alois Hába. Pomiędzy tradycją a innowacją*, trans. into Polish by M. Skotnicka, "Glissando" 2011, No. 17, pp. 83–88.
- 14 S.M. Batta, *Alois Hába's "Neue Harmonielehre des diatonischen, chromatischen, Viertel-, Drittel-, Sechsten, und Zwölftel-Tonsystems"*, PhD dissertation, University of Rochester, Rochester 1980, <https://urresearch.rochester.edu/institutionalPublicationPublicView.action;jsessionid=360F7970FDCF194EB43A0FFB617E1801?institutionalItemId=2625&versionNumber=1> [accessed: 10.06.2017].

the composer with the commentary, and *Study of Quarter Tone Music for Solo Violin by Alois Hába* by Jin Yei-in.<sup>15</sup>

The main aim of this article is to present the persona of Hába, whose output has not been described sufficiently in Polish literature, and the research on the most innovatory assumption of the Czech artist, namely theoretical regulation of microtonal harmony based on equal temperament, and confronting the theory with its practical use on the example of chosen quartets. In the analyses of the quartets, the attention is paid to three issues connected with the practical usage of microtonality: notation of new pitches, its vertical and horizontal use in harmonic consonances and melody, as well as the ways of exposing the microtonality, influencing the texture of discussed works.

### **Sketch of Hába's biography and sources of his interest in microtonality**

Hába's activity took place at the time of diverse searches made by the composers in terms of harmony and the phenomenon of sound. The most intense stage of the artist's work, the 1920s and the 1930s, was at the time of activity of the Second Viennese School and such artist as Edgar Varèse or Henry Cowell. The fact of undertaking the topic of microtonality by the Czech composer was not the only phenomenon in the first half of the 20th century. The microtones were used then by both Russian futurists, such as Arthur Lourié (1891–1966), Georgy Rimsky-Korsakov (1901–1965)—the founder of the Circle of Quartertone Music at the Conservatory in Petersburg, and Ivan Vyschnegradsky (1893–1979), who since the 1920s stayed in Paris, as well as composers connected with German centres—Richard H. Stein (1882–1942), Willi von Möllendorff (1872–1934)—the constructor of bichromatic harmonium, Jörg Mager (1880–1939)—the builder of electroacoustic microtonal instruments, and Ferruccio

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15 J. Yei-in *A Study of Quarter-Tone Music for Solo Violin by Alois Hába*, PhD dissertation, University of Cincinnati, College Conservatory of Music, Cincinnati 2015, [https://etd.ohiolink.edu/pg\\_10?o::NO:10:P10\\_ACCESSION\\_NUM:ucini427984021](https://etd.ohiolink.edu/pg_10?o::NO:10:P10_ACCESSION_NUM:ucini427984021) [accessed: 10.06.2017].

Busoni (1866–1924)—the author of *Entwurf einer neuen Ästhetik der Tonkunst*, having a huge meaning for other microtonal artists. One of the most extraordinary centres of microtonal music was at the same time Mexico, where Julián Carrillo (1875–1965) was active as well as his students, known as *Sonido 13*. However, Hába started his searching for microtonal harmonic solutions long before the 1920s.

Alois Hába built a kind of a legend around his childhood, which he included in several publications. It was supposed to influence his whole career path and the interest in microtonality. He was born on the 21st of June 1893 in Vizovice, a small town in Moravian Wallachia. The father of the composer, František, was a farmer, but he also worked as a member of various folk bands. Hába mentioned that he had started playing the violin at the age of six, and he had learnt the notes before learning the alphabet.<sup>16</sup> The whole family were musicians-amateurs, and the future composer together with his father and brothers accompanied folk singers, who in the region of Moravia ornamented the music with embellishments that were a little bigger and smaller than a semitone. In such a musical environment five-year-old Hába was recognised to have perfect pitch, and, as he said, people started to “play” with his unique skill:

My father and brothers [...] sung, whistled and played the sounds that didn't belong to the semitonal system and they wanted to trick me this way—to prove that I cannot recognise all tones. I sung, whistled and played on the violin firstly the closest sound belonging to the semitonal system, and then I specified the sound given me to guess and I decided if the sound is under or below the next tone of the semitone system.<sup>17</sup>

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16 A. Hába, *Mein Weg zur Viertel- und Sechsteltonmusik*, Düsseldorf 1971, p. 10.

17 Orig. “Mein Vater und meine Brüder [...] sangen, piffen und spielten mir Töne vor, die nicht in den Bereich des Halbtonsystems gehören und wollten mich sozusagen damit aufs Glatteis führen—mir beweisen, dass ich alle Töne nicht unterscheiden kann. Ich habe zuerst den nächstliegenden, richtigen Ton des Halbtonsystems gesungen, gepfiffen oder ihn auf der Geige gespielt und dann den Ton angegeben, welcher mir zum Erraten gegeben wurde, und konstatierte, dass der angegebene Ton tiefer oder höher ist, als irgendein ihm am nächsten liegender Ton des Halbtonsystems” (A. Hába, *Neue Harmonielehre des diatonischen, chromatischen, Viertel-, Drittel-, Sechstel- und Zwölftel-Tonsystems*, Leipzig 1927, p. 135).

Both the family games and performing in folk bands, where microtonal ornaments were a natural means of articulation, had a huge impact on the further harmonic studies of Hába.<sup>18</sup> An important experience from the composer's childhood, which also contributed to deepening his sensitivity to intonation, was the high school education. His teacher paid special attention to musicality of language—the meaning of tempo, rhythms, accents, the timbre of voice—and in this way he showed the difference between the sound of Czech and German.<sup>19</sup>

Due to the personal situation and political issues in the first half of the 20th century, Hába was to the large extent an autodidact in terms of composition, as his formal education was often interrupted. After the short course of harmony and counterpoint at a teaching seminar in Kroměříž, when he studied with Professor Stanislav Šula, and then in two-year autonomous composition studying, in 1914 he decided to start systematic compositional studies in Prague. There, thanks to the support of Vítězslav Novák, he became a member of his master class. Unfortunately, due to the war Hába studied only ten months with his teacher because in June 1915 he was called up to the military services. During the war, he continued individual composition studies and collaborated with historical-musical headquarters that collected military

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18 However, Lubomír Spurný in his essay warns us that we should not be easily misguided by this microtonal childhood experiences: “The aim of such a story is clear: Hába introduced the memories to his text with the aim of underlining the uniqueness of his style. [...] Hába talks about the music of his childhood as a pure, unpretentious game and at the same time the source of income, highlighting that the evolution of his aesthetic attitude towards the musical form was not an issue of exclusive caprice, but it came from a simple, practical reality” (orig. “Cel takiego sprawozdania jest jasny: Hába przemycił do kilku swoich tekstów wspomnienia w celu podkreślenia wyjątkowości swojego stylu. [...] Hába opowiada o muzyce swojego dzieciństwa jako czystej, bezpretensjonalnej zabawie i jednocześnie jako źródle utrzymania, zaznaczając, że ewolucja jego postawy estetycznej do formy muzycznej nie była kwestią elitarnego kaprysu, ale wywodziła się ze zwykłej, praktycznej rzeczywistości”, L. Spurný, *Alois Hába. Pomiędzy tradycją a innowacją*, trans. into Polish by M. Skotnicka, “Glissando” 2011, No. 17, p. 84).

19 Another composer focusing on microtonality, Harry Partch, was especially sensitive to the intonation of human speech. The rich descriptions of different ways of intonating the speech can be found in his memories *Bitter Music*, which he wrote during the time of Great Crisis, when he worked as a physical worker.

songs. There he met young composers from Vienna, students of Franz Schreker, thanks to whom after the war he continued the studies with this composer. He also met Bela Bartók, who was the Hungarian collaborator of the centre.

After the war, Hába studied composition with Schreker in Vienna for two years and worked as a proofreader in Universal Edition. At that time his first compositions with opus number were written and, in 1920, his first quartertone composition: *String Quartet No. 2 Op. 7*. During the same year the composer moved to Berlin to continue education with Schreker, he was nominated for a position of the headmaster in Musikhochschule.

The 1920s were crucial for the development of microtonal activity of Hába. In Berlin he met composers studying the phenomenon of microtonality, such as Busoni, who inspired him to use the interval of  $1/6$  tone. Then, Hába became interested in building the quartertone piano. From Möllendorff and Mager, met in Berlin, who earlier constructed quartertone harmonium, he knew about the difficulties in finding the company that would like to prepare such an instrument. Finally, his project was realised by the company August Förster from Georgswalde. In 1923, as the result of nationalist tendencies, gaining popularity in Germany, Hába decided to come back to his homeland. He was a lecturer at Prague Conservatory, teaching acoustics and analysis, and also had quartertone courses. Then, his publications devoted to quartertone music and athematic style<sup>20</sup> were written: *Von der Psychologie der musikalischen Gestaltung* (Vienna 1925) and *Neue Harmonielehre des diatonischen, chromatischen, Viertel-, Drittel-, Sechstel- und Zwölftel- Tonsystems* (Leipzig 1927).<sup>21</sup> In 1934 the Institute of Quartertone Music was launched at Prague Conservatory.

Based on the composer's memories, several sources of his interest in microtonal music can be indicated. In the earliest publication concerning quartertones, *Harmonické základy čtvrtónové soustavy* from 1922, he wrote about acoustic experiments of Carl Stumpf and

20 Hába defined athematic style as "avoiding any repetition of variation-like transformation of the melodic idea" (A. Hába, *Mein Weg...*, *op. cit.*, p. 22). The idea of athematism was based on the gradual development of the melody without introducing repetition or transposition of the motifs.

21 A. Hába, *Von der Psychologie der musikalischen Gestaltung: Gesetzmäßigkeit der Tonbewegung und Grundlagen eines neuen Musikstils*, Wien 1925.

Erich Hornbostel.<sup>22</sup> In *Neue Harmonielehre* he discussed historical bases of microtonality. The most important source of his microtonal output and the element which distinguished him from contemporary pioneers of microtonality is folk music. At the beginning, Hába studied local folklore from the area of Moravia, in which yet in the childhood he noticed the intervals that are smaller than a semitone. Then, he noticed that similar microintervals appear also in folk music of the neighbouring countries: Romania, Hungary, Bulgaria and then Yugoslavia, as well as in Scandinavian countries: Sweden and Norway.<sup>23</sup> The person who helped Hába in the 1920s in investigating the topic of traditional music, including non-European music, was Georg Schünemann, a headmaster of Berlin Hochschule für Musik. He gave the composer access to ethnomusicological recordings gathered in Phonogramm-Archiv. Hába mentioned the studies on oriental music yet in 1924. In 1932 he took part in the international conference about Arab music in Cairo. In his observation on the topic he indicated, among others, characteristic intervals: a quartertone diminished by a major second ( $3/4$  tone), “neutral” third (between minor and major third), “neutral” sixth (between minor and major sixth) and a seventh, which, as he wrote, is neither minor nor major.<sup>24</sup>

### **Theory of microtonality—*Neue Harmonielehre***

The most important theoretical treatise written by Hába concerning microtonality was *Neue Harmonielehre des diatonischen, chromatischen, Viertel-, Drittel-, Sechstel- und Zwölftel-Tonsystems* published in Leipzig in 1927.<sup>25</sup> The work was created in 1925, firstly in Czech, and then translated into German by the composer himself in the cooperation with Erich Steinhard. The book has a form of course book with numerous note examples and consists of three chapters devoted to different sound systems:

22 V. Reittererová, L. Spurný, »*Musik am Rande*«. *Einige Bemerkungen zur Typologie der Musik von Alois Hába*, “Muzikološki zbornik”, Ljubljana 2011, No. 47 (1), p. 155.

23 B. Pilarski, *Alois Hába w kręgu swych wspomnień*, “Ruch Muzyczny” 1958, No. 21, p. 11.

24 A. Hába, *Von der Psychologie der musikalischen Gestaltung: Gesetzmäßigkeit der Tonbewegung und Grundlagen eines neuen Musikstils*, Wien 1925, p. 47.

25 A. Hába, *Mein Weg...*, *op. cit.*, p. 55.



- I. Melodische und harmonische Grundlagen des diatonischen und chromatischen Tonsystem.
- II. Melodische und harmonische Grundlagen des Vierteltonsystems.
- III. Melodische und harmonische Grundlagen des Drittel-, Sechstel- und Zwölfteltonsystems.<sup>26</sup>

The course books starts with the “genealogy”<sup>27</sup> of Czech composers and theorists, the concepts of whom had a great impact on the musical development of Hába. Among his ancestors, the composer mentions František Zdenek Skuherský, Karl Stecker and his teacher Vítězslav Novák. Their attitude is characterised by free connecting all chords without modulations prepared before. After his masters, Hába gives the following principal idea:

Every tone can be connected to another tone of every sound system (referring to each other). Every double stop and chord can be connected to another double stop and chord of any sound system.<sup>28</sup>

The table of contents itself shows that Hába does not cut off from equal temperament, and microtonality is only its continuation, what is confirmed by numerous statements from chapters two and three. Hába, when writing about quartertonality, remains such terms as tonality or central tones:

The rule of tonality and polytonality is preserved in quartertone system [...]. However, new scales are created as bases of tonality.

Also, the rule of central tones remains valid, in a wider sense; any tone from the scale of 24 can be connected with all remaining tones.<sup>29</sup>

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26 A. Hába, *Neue Harmonielehre des diatonischen, chromatischen, Viertel-, Drittel-, Sechstel- und Zwölftel-Tonsystems*, Leipzig 1927.

27 Each of the composers mentioned by Hába was the teacher of another one, and the last one, Vítězslav Novák, taught Hába.

28 A. Hába, *Neue Harmonielehre...*, *op. cit.*, pp. VI–VII.

29 A. Hába, *Neue Harmonielehre...*, *op. cit.*, pp. 156–157.

## Quartertone system

In the second chapter of *Neue Harmonielehre* the composer presents two ways of notation of new sounds. Their names are taken from Möllendorf, adding affixes *hoch* (high) and *tief* (low) to any other sound, e.g.: *c-hoch c-cis-hoch cis-d-hoch d* and *c-tief c-h-tief h-b-tief b*. Hába also introduces new terms for twelve newly-created intervals. The three smallest ones:  $1/4$ ,  $3/4$  and  $5/4$  tone are described as new types of seconds: *Vierteltonsekunde*, *Dreivierteltonsekunde*, *Fünfvierteltonsekunde*. Remaining intervals receive the affix *hohe* (high) or *neutrale* (neutral). Neutral intervals are between minor and major, and all remaining ones are high.

The composer assumes two possibilities of using quartertonality—the mixed form when the quartertone scale is treated as a combination of two semitone ones and the pure form, when the quartertone scale is seen as the unity. Hába also allows the possibility to use the fragments based only on the semitone systems and its quartertone transposition in the quartertone composition. The key ability for him is to move between these two systems.

The example of broadening the sound diversity in the quartertone system is increasing the number of possible division of the particular intervals. The whole tone in the quartertone system can be divided into smaller intervals in as many as seven different ways (2 semitones,  $1/4$  and  $3/4$  tone—and the other way round, two quartertones and a semitone—three combinations, the division between four quartertones). As Hába notices, such a division makes it possible to arrange the motifs in variations through more diverse changes of tones.

Particularly much attention is paid by the Czech artist to the chords consisting of identical intervals. He starts analysing possibilities of the new system with the smallest intervals and checks if a developed multi stop (without repetition of the pitch) can be achieved in this way and if its possible transpositions will cover all possible sounds of the 24-tone scale. Hába introduces the simple version of scales of restricted transposition (restricting himself only to the scales consisting of equal tones).

24-tones, besides the obvious quartertone, create the following intervals:  $5/4$  tone,  $7/4$  tone (neutral third),  $11/4$  tone (high fourth)

and their inversions position:  $19/4$  (high major sixth),  $17/4$  (neutral sixth) and  $13/4$  tone (high augmented fourth). The interval of  $3/4$  tone makes it possible to build a 8-note chord, two transpositions of which—quartertone and semitone—use all 24 tones of a scale. The whole-tone scale (6-note chord) and its three transpositions ( $1/4$ ,  $1/2$  and  $3/4$  tone) also cover the whole quartertone scale.

Hába gives many examples of other scales in the quartertone system: asymmetrical, symmetrical and tetrachordal—and the last term refers to the form of two identical parts of the scale and can exceed the range of four tones. The interesting results are achieved from tetrachordal form of the scales of the octave division into two high fourths (with central semitone). Through the chain of 24 such tetrachords, in which the second tetrachord of the beginning scale becomes the first tetrachord of the following scale, the composer introduces a kind of a circle, like the circle of fifths, into the quartertone circle. The basic interval that “links” the following tones of the scale is an augmented fourth instead of fifth.

### **The system of $1/6$ tone**

Although in the title of the last part of *Neue Harmonielehre* there are names of as many as three harmonic systems, Hába never composed in two of them ( $1/3$  and  $1/12$  tone). At the beginning of the third chapter, the composer gives the complex system of the marks for the system of  $1/12$  tone, basing on the symbols of sharp and flat from the semitone system. As these marks “multiply” every  $1/12$  tone, the choice of proper signs from the whole spectrum of eleven augmenting and six diminishing symbols makes it possible to write the composition in  $1/3$  and  $1/16$  tone.<sup>30</sup> Hába also names the marked sounds by affixes taken from the fractions of tones that changes the particular sounds: *drittel* (one third) and *sechstel* (one sixth). Different from the quartertone system, the names of

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<sup>30</sup> In *Mein Weg...* he proposes four symbols that are sufficient to note the music in the system of  $1/6$  tone. They are identical to sign the quartertone system: the marks which diminish and augment by  $1/4$  and  $3/4$  tone (A. Hába, *Mein Weg...*, *op. cit.*, p. 65).

new intervals are restricted to only friction names: *Drittelton*, *Zweidrittelton*, *Vierdrittelton* ( $1/3$  tone,  $2/3$  tone,  $4/3$  tone).

In *Neue Harmonielehre* the description of the system of  $1/3$  and  $1/6$  tone is analogical to the description of the quartertone system. There is a combinatorial construction of double, triple and quadruple stops, and multi stops—scales built from identical intervals. In the last case Hába analyses which intervals allow to build the full 18- (in the case  $1/3$  tone) and 36-tone (in the case of  $1/6$  tone) scale. Similarly to the quartertone system, Hába introduces the chains of tetrachords, which next he writes in the circles that are the kind of circle of fifths.

### System of $1/5$ tone

Among microtonal systems used by Hába, the least documented one is the system of  $1/5$  tone. The composer met it only in 1948, when during the festival IGNM in Haarlem he heard the lecture of Professor Adriaan Daniel Fokker concerning the topic of the 31-tone system and short composition in this system, written by Dutch artists: Fokker himself as well as Van Dijk and Van Westering. Hába, as he mentions in *Mein Weg...*, during sixteen years he rarely practiced his melodic and harmonic imagination in this system, adapting his musical awareness to new theoretical rules. The first and only Hába's composition in the  $1/5$  tone system was created only in 1967. It was the last, *String Quartet No. 16*. After long practice and recognising the rules of the new system, composing itself was not a problem to Hába:

The work was created in comparably short time from 30.06 to 25.07.1967, without effort, from vivid, bright musical imaginations in the  $1/5$  tone system, without help of any instrument. I wrote it so confidently and in such an obvious way as in the past the first quartet Op. 7 in the quarter-tone system, 47 years ago.<sup>31</sup>

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31 Orig. "Das Werk entstand in der relativ kurzen Zeitspanne vom 30.6 bis 25.7 1967, mühelos, aus lebendigen, klaren musikalischen Vorstellungen im Fünfteltonsystem, ohne Hilfe eines Instrumentes. Ich schrieb es so sicher und selbstverständlich wie seinerzeit das erste Streichquartett op. 7 im Vierteltonsystem vor 47 Jahren" (A. Hába, *Mein Weg...*, *op. cit.*, p. 69).

Among the most important theoretical assumptions of this system, Hába includes the difference of  $1/5$  tone between enharmonic sounds and identical in the semitone system. However, he paid attention to the fact that during the practice of playing the string instruments this difference is always present and “every professional violinist plays even today sounds marked as  $\flat 1/5$  tone (diesis) higher than the ones marked  $\sharp$ ”.<sup>32</sup> Such an approach made it possible to use the marks provided by Hába to write quartertone music also in this system. Symbols serving so far to augment and diminish sound by a quartertone were used to augment and diminish sound by  $1/5$  tone.

### Analysis of chosen quartets

In Alois Hába's output chamber and solo compositions dominate. Among them, there are sixteen string quartets in the systems of semi-, quarter-,  $1/5$ - and  $1/6$ -tone. Hába wrote quartets through his whole life—*No. 1 Op. 4* comes from the time of studies, and the last, *No. 16 Op. 98*, from 1967. These compositions are much different from each other not only because of the use of different sound systems but also in terms of the structure and style.<sup>33</sup> String quartet seems to be the most convenient medium to do microtonal experiments, as it does not require building new instruments, and performers “only” need great hearing and intonation. At the same time, it provides the composer with comparatively wide possibilities thanks to quite huge range of registers and timbres of instruments and the number of voices.

32 Orig. “Ein geschulter Geiger spielt noch heute instinktiv die mit  $\flat$  bezeichneten Töne eben um einen Fünftelton (Diesis) höher als die mit  $\sharp$  bezeichneten” (*ibid.*, p. 67).

33 Below there is the list of all quartets with the annotation in which system they were written. The compositions without annotations are in semitone system: *No. 1 Op. 4* (1919); *No. 2 Op. 7* ( $1/4$  tone, 1920); *No. 3 Op. 12* ( $1/4$  tone, 1922); *No. 4 Op. 14* ( $1/4$  tone, 1922); *No. 5 Op. 15* ( $1/6$  tone, 1923); *No. 6 Op. 70* ( $1/4$  tone, 1950); *No. 7 Op. 73* (“*Vánoční*” [*Christmas Quartet*], 1951); *No. 8 Op. 76* (1951); *No. 9 Op. 79* (1952); *No. 10 Op. 80* ( $1/6$  tone, 1952); *No. 11 Op. 87* ( $1/6$  tone, 1958); *No. 12 Op. 90* ( $1/4$  tone, 1960); *No. 13 Op. 92* (1961); *No. 14 Op. 94* ( $1/4$  tone, 1963); *No. 15 Op. 95* (1964); *No. 16 Op. 98* ( $1/5$  tone, 1967).

Four quartets will be analysed: *No. 2 Op. 7*, *No. 9 Op. 87*, *No. 14 Op. 94* and *No. 16 Op. 98*. The choice of these compositions makes it possible to compare all microtonal systems that used by Hába. Simultaneously, through the juxtaposition of the first and last quartertone quartets (*No. 2* and *No. 14*) it can be observed how the way of using and presenting quartertones changed through the years. The analysis below aims at investigating the possibilities and methods of using microtones, so the special focus is on the particular elements of the composition connected with sound material and notation, and in the smaller way on building the works. Such elements have been specified as melody, harmony and texture, important for Hába in *Neue Harmonielehre*, where he discussed the use of new intervals vertically and horizontally, as well as constructing voices in the new harmonic systems.

## Notation

In *Neue Harmonielehre* Hába provided two alternative ways of noting the quartertone system.<sup>34</sup> The first of them was based only on two signs: augmenting and diminishing by a quartertone, and was the same as in the notation of *Quartet No. 2*.<sup>35</sup> The second method used four symbols: two augmenting (by  $1/4$  and  $3/4$  tone) and two diminishing by the same intervals.

Although in *Neue Harmonielehre* Hába provided a very complex way of writing the systems being the multiplicity of  $1/12$  tone, compositions in  $1/6$  tone were in practice noted using simpler symbols, based on signs from the quartertone system. In *Quartet No. 11 Op. 87* Hába introduced as many as six additional marks—three augmenting by  $1/6$ ,  $1/3$  and  $2/3$  tone and three diminishing by the same intervals. On the one hand, they allowed the enharmonic changes, which were impossible using notation

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34 A. Hába, *Neue Harmonielehre...*, *op. cit.*, p. 140.

35 However, this system of notation must have been created some time after finishing the work all during the editorial process, as in the autobiography *Mein Weg...* Hába mentioned that in the manuscript of the quartet, presented to his Professor Franz Schreker, for quartertones there were only symbols of plus and minus next to the notes (A. Hába, *Mein Weg...*, *op. cit.*, p. 40).

proposed in *Neue Harmonielehre*, on the other they complicated quick reading the pitch of the new sounds (compare: Example 1).

In the case of the only quartet in the system of  $1/5$  tone (No. 16 Op. 98) there are new marks—simplified sharp augmenting by  $1/5$  tone and the reversed flat, known from quartertone compositions, diminishing by the same value. The symbol of augmenting used in the score differs from used the one used when discussing this system in *Mein Weg...*—in the book Hába uses the same symbols as in the quartertone system, e.g. in *Quartet No. 2*. The particularly significant for the notation of the last quartet are “common” signs, as the system of  $1/5$  tone does not predict the enharmonic identities. Between enharmonic sounds, sounding identically in the semitone system the composer introduces the difference of  $1/5$  tone. In this way, the traditional sharp augments, and flat diminishes sound by  $2/5$  tone.

LES SYMBOLES DE TRANSPOSITION :

znáčí zvýšení tónu  
bedeuten Erhöhung des Tones  
signifient l'élévation du ton

znáčí snížení tónu  
bedeuten Erniedrigung des Tones  
signifient l'abaissement du ton

o um 1/6 tón de Ton  
o um 1/3 tón de Ton  
o um 2/3 tón de Ton

o um 1/6 tón de Ton  
o um 1/3 tón de Ton  
o um 2/3 tón de Ton

Ex. 1: Alois Hába, *String Quartet No. 11* Op. 87—preface. Symbols of augmenting and diminishing by  $1/6$ ,  $1/3$  and  $2/3$  tone.

## Harmony

In *Neue Harmonielehre* Hába noticed that quartertonality can be understood as the conjunction of two semitone scales moved by a quartertone or—overall—as a full 24-tone scale. According to the composer, the full (“pure”) use of quartertonality is confirmed by the use of new microtonal intervals, both horizontally and vertically. The last one is discussed by Hába widely in his treatise, explaining the new types of chords that do not appear in the semitonal system.

Because of this, the research on vertical intervals in his microtonal compositions is an especially important element of analysis.

The significant aspect discussed in *Neue Harmonielehre* is also the issue of creating new scales. On the one hand, Hába proposed the maximal use of full possibilities of the 24-tone scale in the case of quartertones and 36-tone in the system of  $1/6$  tone,<sup>36</sup> on the other he showed the rules of building from five- to 23-tone scales based on the quartertone and from seven- to 35-tone scales based on  $1/6$  tone—symmetrical, asymmetrical and “tetrachordal”. Such a huge variability and diversity of possibilities causes that the search for scales used in Hába’s compositions is an extremely difficult task. In the summary of the chapter concerning the quartertone system, Hába wrote that with the exception of several examples he would not be able to indicate the scales used in his compositions, as they result from his compositional intuition. This reluctance to reveal used scales or using them in a really intuitive way are confirmed by the introductions to the analysed work. There are general descriptions of the form and indications about the notation, but there is a lack of the specific analysis of a microtonal melody. The search for scales used by Hába would have to be restricted to very short fragments, as, how analyses of chosen quartets show, in particular parts all or almost all scales possible for particular systems of the pitch were used.

*String Quartet No. 2*, written at the beginning of the 1920s in Vienna just after studies with Schreker is atonal, what is additionally intensified by quartertone multi stops, although they are not the only reason for achieving atonal harmony. In only five first bars the composer presented the whole material of the 24-tone scale based on a quartertone. The work preceding *Neue Harmonielehre* around five years is the first quartertone composition by Hába and shows that the concept of the new sound system was then only shaping in the artist’s mind. In *Mein Weg...*, the autobiography written almost half a year after creating the quartet, Hába mentioned:

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36 In the system of  $1/5$  tone we have a full scale, consisting of 31 tones: in *Neue Harmonielehre*  $1/5$  is not yet mentioned, and in *Mein Weg...*, where Hába discusses this system in the most detailed way, there is no information about the number of tones.



In melody of the string quartet No. 1 [in the original—in reality No. 2] Op. 7 in the quartertone system, quartertones were often used; namely only for usage, as passing and leading tones, similarly to semitones in the semitone system. In the quartertone *Quartet* Op. 12, bigger intervals were used more frequently, with an added or taken quartertone; they are characterised by the courageous way of presence and expression. Both works are complementing each other in explaining multiple possibilities of using the quartertone system.<sup>37</sup>

The information of using quartertones as passing tones explains much in terms of harmony of *Quartet No. 2* Op. 7, because in the work multi stops from the semitone system dominate, which sometimes moved by a quartertone only create the impression of new harmony. In the case of chords, the ones coming from outside of the semitone or quartertone systems are very rare. Chords including colouring effect of quartertone movements most often result from overlapping of polyphonic melodies and appear in fast passages, because of which they are impossible to catch by the listener. Perhaps avoiding simultaneous microtonal multi stops in the first quartertone composition resulted from the composer's fear of the performance abilities of his contemporary musicians, for whom this quartet was probably the first contact with quartertonality. Simultaneous tuning of all instruments in microtonal multi stop could be much more difficult than melodic passages of quartertones for the performers who are not acquainted with new intonation.

Multi stops which are much more complicated and demanding perfect intonation from performers appear in *Quartet No. 14*, what is especially interesting as the composition does not seem to be as atonal as *Quartet No. 2*. This feeling is the result of wide intervals that eliminate the feeling of quartertonality—the work begins with the chord high-*D*, *c*<sup>1</sup>, high-*a*<sup>1</sup>, *g*<sup>2</sup>. In the multi stop, there are two fifths (one twelfth), but also three minor sevenths

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37 Orig. "In der Melodik des 1. Streichquartetts op. 7 im Vierteltonsystem werden Viertelöne oft verwendet, und zwar funktionell, als Durchgänge und Leitöne, ähnlich den Halbtönen im Halbtonsystem. Im ebenfalls vierteltönigen Streichquartet op. 12 werden dagegen häufiger die größeren, um einen Viertelton erweiterten oder verengten Intervalle gebraucht; sie charakterisieren eine kühnere Vorstellungs- und Ausdrucksart. Beide Werke ergänzen sich in der Ausdeutung der vielseitigen Verwendungsmöglichkeiten des Vierteltonsystem" (A. Hába, *Mein Weg...*, op. cit., p. 24).



appear yet in the first twelve bars, but very transparent texture and major triads, moved by quartertones, results in the feeling close to tonality. The part finishes with specifically bi-tonal chord consisting of the chords  $C^{\flat}$  moved by a quartertone above and D major with the additional high- $d^{\sharp}$  (compare: Example 3).

$1/6$  remains the smallest fraction of the tone used by Hába. This interval sounds much softer than a quartertone, and wider intervals augmented or diminished by  $1/6$  tone do not seem to be so much different from the intervals of the semitone system. In this system the “illusion” of tonality can be created very easily. In the introduction to the publication of *Quartet No. 11* the composer wrote:

In melody and harmony twelve intervals of the semitone system (from minor second to octave) were used, and the same, diminished or augmented by  $1/6$  tone. Intervals that are diminished by  $1/6$  tone sound softer than originally major and minor; augmented by  $1/6$  tone sound sharper, more aggressively.<sup>38</sup>

Further, the significant notice is made about the character of this composition because Hába underlined that such changes of intervals with the fraction of tone sometimes appear in performance practice of folk and jazz singers. The artist highlighted that his output is, in its assumption, closer to folk music than “exclusive” art. Therefore, harmony of *Quartet No. 11* is close to tonality, what is heard at the beginning of the work, when the chords of A major with a minor ninth and sixth instead of a seventh and D minor with a sixth appear—both with deviation of  $1/6$  tone. The first part finishes with chords in A major with a sixth, D major with a sixth and E minor with a minor seventh (also with deviations of  $1/6$  tone) (compare: Example 4).

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38 A. Hába, *XI. Quartetto per due violini, viola e violoncello nel sistema Sestitonale op. 87*, Praha 1963, p. IX.

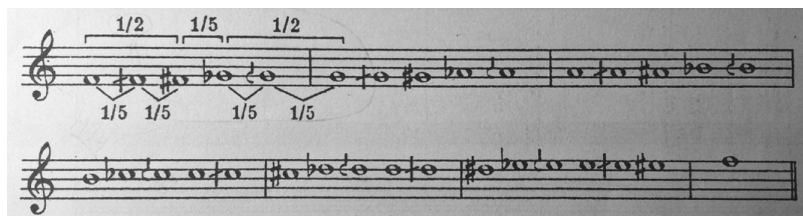


Ex. 4: Alois Hába, *String Quartet No. 11* Op. 87, part 1, bb. 120–123, last chords.

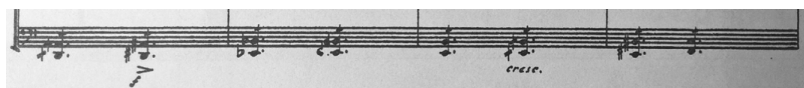
*Quartet No. 11* as the sole one is based on the specific sound ideas, explained by the composer in the introduction: *haba* and *hadeeaa* (as well as their augmentations and diminutions  $1/6$  tone). These pitches were used proportionally more often than others. However, in *Quartet No. 11* the composer used, similarly to quartertone quartets, the full range of tones of a new system. Yet in the beginning two hundred bars of the first part, the whole 36-tone scale of  $1/6$  tone was presented. Like a confirmation that the composer used the full possibilities of the system, from the tenth bar the chromatic figurations of the part of the first violin appear, and in the parts of remaining instruments the chord of intervals of  $7/6$  tone and a major third, led through the semitone scale. In the second part, the following pitches of the 36-tone scale appear in a long distance of time—the full scale is used only in the  $2/3$  length of this fragment (short before the return of any slow tempo). In the third part the sound  $a + 1/3$  does not exist at all.

The last quartet, as the only Hába's work written in the system of  $1/5$  tone, is the most doubtful in terms of harmony. The harmonic system of  $1/5$  tone from the mathematical point of view should reject the existence of semitones and any intervals consisting of their odd multiplicities (minor second, minor third, fourth, fifth, major sixth, major seventh). The scale of  $1/5$  tone would have to consist of thirty tones with the assumption that every tone of a whole-tone of six tones is divided into five parts. However, Hába used—similarly to Adrian Fokker—the scale consisting of thirty-one tones. It was included in the introduction to

the score (compare: Example 5), and in practice wholly presented in the fifth part of the quartet in parallel fifths in the cello part (compare: Example 6).

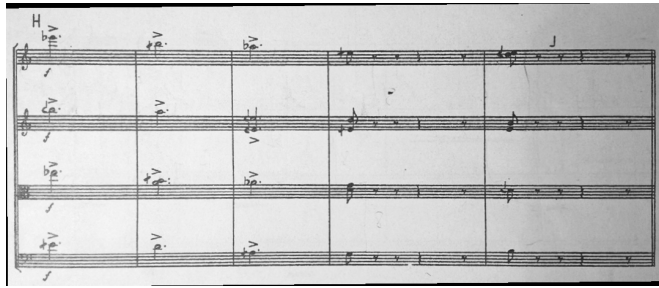


Ex. 5: Alois Hába, *String Quartet No. 16* Op. 98, preface. 31-tone scale.



Ex. 6: Alois Hába, *String Quartet No. 16* Op. 98, part 5, bb. 45–48, the fragment of 31-tone scale led in parallel fifths in the part of cello.

Both the scale in the introduction and the examples from *Mein Weg...* show that the system of  $1/5$  tone requires double harmonic thinking. It is because, on the one hand, it is the division of the whole tone into five smaller intervals, and on the other with the division into two semitones with the difference that Hába rejected the enharmonic identity. For example, the whole tone between  $f$  and  $g$  is divided into semitones  $f-f\#$  and  $g\flat-g$ , but between  $f\#-g\flat$  there is still a  $1/5$  tone of difference. Therefore, between sounds  $e f$  and  $b c$  there is the interval of  $3/5$  tone. Because of the presence of semitones, in the quartet there are also other intervals based on the semitone system, e.g. fifth, which is clearly exposed in the whole composition both horizontally and vertically—also in the chords. In the chords, which are rather rare due to the punctual character of the texture of this quartet and frequent solo fragments, octaves, fifths and fourths dominate, juxtaposed as the microintervallic shift. The fifth part of the quartet finishes with the sequence of intervals, among others  $b$ , low- $d^1$ ,  $e^1$ ,  $b^1$ , low- $d^2$ ,  $e^2$  (compare: Example 7).



Ex. 7: Alois Hába, *String Quartet No. 16* Op. 98, part 5, bb. 83–87, last chords.

## Melody

For all analysed quartets of Hába three characteristic ways of building microtonal melodies can be built:

- Oscillating around one sound;
- Bigger interval leaps—fourths, fifths, sixths, sevenths—augmented and diminished by microintervals;
- Repeating one pitch several times.

To these observations also other basic ways of shaping melody can be added, which can be treated as the development of first two ways:

- The movement is based on microintervals, often using following tones of the scale;
- Repeating intervals melodically several times.

Melody going through the following degrees of the bichromatic scale<sup>39</sup> (or related in the system  $1/5$  and  $1/6$  tone) is one of the most frequent types of melody in microtonal quartets of Hába, which at the same time is the best to expose this phenomenon. As wider intervals can deceive the perception of a listener, juxtaposing sounds of as close distance as possible does not raise

<sup>39</sup> Of a quartertone scale consisting of the next twenty four tones.

doubts about the usage of the microtonal system. In *Quartet No. 2* Op. 7 both themes are based on the rule of the following tones of the quartertone scale. The melody of the main theme begins ascending, and the side theme—descending. In the second case after two quartertones there is a skip of high augmented fourth (tritone with a quartertone). In the whole work, besides thematic material there are also numerous passages, often parallel, comprising the fragment of the bichromatic scale. Like to dispel doubts in which harmonic system the whole quartet is maintained, the composition is closed with two fragments of bichromatic scales played simultaneously by the second violin, viola and cello (compare: Example 8).



Ex. 8: Alois Hába, *String Quartet No. 2* Op. 7, last bars. Parallel voice-leading through the bichromatic scale.

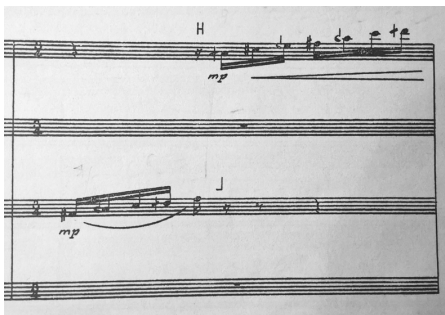
The inclination to expose new microintervals as presenting the following tones of a scale can be connected with the issue of “innovation” of a harmonic system, in which both listeners and the composer himself meet for the first time. As in the last quartertone quartet bichromaticism is more ornamented or with figurations—melodies based on microintervals appear, but the series of following pitches is rare—in the quartet in the system of  $1/5$  tone (first and only one in this system, written four years later) Hába came back to the above-mentioned way of highlighting new possibilities of the system. A short descending motif on the following tones between *D* and *C* is already the part of the solo introduction in the part of cello, which is mainly based on microtonal deviations from one pitch. Similar microtonal shifts within the whole tone appear also in the sixth part, and the whole 31-tone scale from *g* to *d#* parallel

from C to g (what was mentioned in the subchapter concerning harmony) was presented in the fifth part.

In *Quartet No. 11 Hába* avoided direct expositions of the fragments based on the following tones of the scale—the work is not his first composition in the system of 1/6 tone. Although in it there are many chromatised passages based on small intervals, they are diverse melodically. Exposing the microtonal system and its maximal use is connected with ornamenting the melodic line.

Among melodies built from the intervals bigger than a quartertone, especially interesting are passages built only from the intervals outside the semitone system. In *Quartet No. 2* the move of 3/4 tone often appears, which is much more surprising in its timbre—brighter, but also more distant from the semitone system—than the move of a quartertone. In the second part of the last quartet, on the contrary, there is the passage of the intervals of 6/5, 7/5 and 9/5 tone (compare: Example 9).

Very characteristic figure for the melody of analysed quartets is repeating different melodic intervals several times. This sonic idea is often juxtaposed at the same time in two or three parts, creating the effect of “instable” harmony. It can happen “statically”, without the change of the pitch of the following intervals, like in the second part of *Quartet No. 16* or move through the scale like the figures of the first part of *Quartet No. 11* (compare: Example 10). Usually, it has motoric character, but it also happens to be used in more cantilena-like fragments, e.g. in the part of cello in the first part of *Quartet No. 16*, where the interval of fifth is repeated.



Ex. 9: Alois Hába, *String Quartet No. 16* Op. 98, part 2, b. 29. Passage consisting of the intervals of 6/5, 7/5 and 9/5 tone.





Ex. 10: Alois Hába, *String Quartet No. 16* Op. 98, part 1, bb. 104–106. Intervals repeated melodically.

## Texture

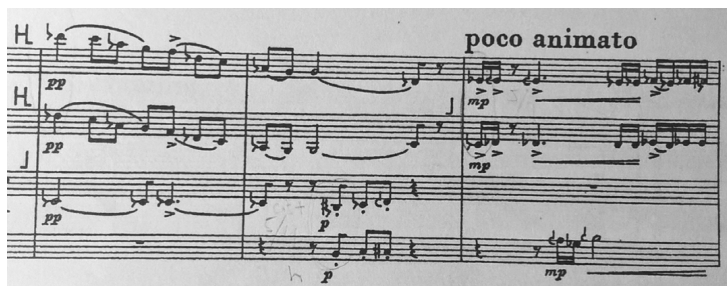
Analysed string quartets can be divided in terms of texture into two types. In the first type, there are earlier compositions—including *Quartet No. 1* Op. 7, as well as written almost forty years later, in 1959, *Quartet No. 11* in  $1/6$  tone. There are characterised by the dense, often polyphonic texture. The second type is represented by the works written at the end of Hába's life, showing the clear pursuance towards diluting multi stops. Such an approach towards the musical texture is presented in the last quartets, the textural transparency of which completely changes the reception of microtonal melodies and multi stop. In quartets *No. 14* and *No. 16*, quartertones and  $1/5$  tones stops being the element of dense atonal structure and start being a completely new sonic system. In this aspect, the especially unique quartet is *No. 16*, in which the composer used the punctual texture, e.g. at the beginning of the third part and in the eighth part.

In all analysed compositions several common, characteristic for Hába's style ways of shaping and linking parts can be distinguished:

- Parallels;
- Opposite movement, namely inversion of voices;
- Short imitations of the motifs, appearing in the following voices (the most often ascending or descending).

One of the most characteristic methods of shaping voices are parallel passages of melodic lines in different intervals. Among intervals outside the semitone system Hába willingly used intervals oscillating around the whole tone:  $5/4$ ,  $4/5$ ,  $7/6$  tone. Major second, augmented by a quartertone, appears in the first part of *Quartet No. 14*, where right after the fragment in octaves in the parts of first and second violin there is a rapid shift to the microtonal interval, firstly between the parts of viola and cello, and then between melodic lines of the violins (compare: Example 11). The whole (with the exception of four bars) fourth part of *Quartet No. 16* is based on the parallel parts of viola and cello in the interval of a major second diminished by  $1/5$  tone (compare: Example 12).

Similar phenomenon can be also observed in *Quartet No. 11*. Besides sporadically appearing intervals from the semitonal system, the most frequently used interval is  $7/6$  tone. In the work there is also parallel shaping of three voices in the third part, where between the part of second violin and viola there is the interval of  $7/6$  tone, and between the part of viola and cello  $4/3$  tone (compare: Example 13). In the second part of the quartet two melodies are simultaneously shaped in parallel intervals—the parts of violins in the interval of  $7/6$  tone, viola and cello in octaves.



Ex. 11: Alois Hába, *String Quartet No. 14* Op. 94, part 1, bb. 13–15. Parts in parallel octaves and the interval of  $5/4$  tone.

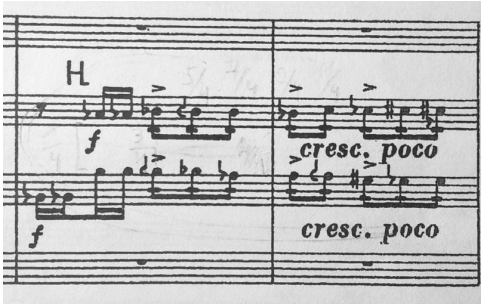


Ex. 12: Alois Hába, *String Quartet No. 16* Op. 98, part 4, bb. 12–16. Parallel parts in the interval of  $4/5$  tone.



Ex. 13: Alois Hába, *String Quartet No. 11* Op. 87, part 3, bb. 26–27. Parallel parts in the intervals of  $7/6$  and  $4/3$  tone.

Interesting sonic effect, although not used so frequently by the composer as parallel movement provides the opposite shaping of voices based on the rule of ideal symmetry. The figure appears for example in the fourth part of *Quartet No. 14*, in which the sound of a quartertone between the parts of second violins and viola increases gradually with every semitone, namely:  $1/4$ ,  $3/4$ ,  $5/4$  until the major ninth diminished by a quartertone (compare: Examples 14a and 14b).



Ex. 14a: Alois Hába, *String Quartet No. 14* Op. 94, part 4, bb. 52–53. A symmetrical figure differentiating  $1/4$  tone from a major ninth diminished by  $1/4$  tone.



Ex. 14b: Alois Hába, *String Quartet No. 14* Op. 94, part 4, b. 54. Symmetrical figure differentiating  $1/4$  tone from a major ninth diminished by  $1/4$  tone.

For the fragments which open and finish particular parts of the quartets introducing voices in time distance is very characteristic. It refers both to singular sounds creating, in consequence, a chord and short motifs going through all registers and instruments. In the case of a chord built in this way, the precise perception of the microtonal chords becomes simpler.

## Conclusion

Microtonal quartets of Hába are an interesting and unique example of using equally tempered microtonal systems. The composer broadened the previous possibilities of a harmonic system, dividing

the tone into more than two equal intervals. However, he did not reject totally the rules of the semitone system, so in his quartets oscillating between the total atonality and microintervallic coloured tonality is frequent, as well as between artistic and folk music.

Dual attitude, e.g. the attachment to the rule of central tones and at the same time the total randomness of connecting the chords as well as including new microtonal systems in the circles of fifths taken from tonal harmony Hába presented also in the theoretical treatise *Neue Harmonielehre*. Thanks to references to the tradition, the course book is a unique position among so frequent in the first half of the 20th century works of other microtonal composers. It is because it presents not only the concept of using microtones—their notation, building new chords and scales—but it presents microintervals in the wider harmonic context, showing that it is not a system that is cut off from the earlier assumptions, but only their broadening.

However, the analyses of the quartets showed that the compositional practice of Hába somehow differentiates from his theoretical assumptions. First differences are seen yet on the level of notations, different from the one written in *Neue Harmonielehre*. In quartets the composer also more often included all possible pitches without restricting himself to the choice of scales about which he wrote in the course book. Although he recommended using “pure” quartertonality, both vertically and horizontally, frequently—especially in *String Quartet No. 2 Op. 7* (although also in *No. 14*) there are chords from the semitone system, only shifted by a quartertone.

Analysed quartets are also the proof for the development of language and style of the composer. Yet the first, quartertone quartet consists of many new solutions, starting with harmonic innovations, which were the use of quartertones and their diverse ways of presenting, through atonal harmony typical for then contemporary stylistics, to atypical attitude towards the form. In the last compositions the artist does not reject, as it could be assumed, new ideas for traditions, but the opposite. Although in the last two quartets the simplification of the texture is visible, it is provoked by the desire to underline microtonality. The special example of joining tradition and innovation, and at the same time the summary of the whole Hába's activity is the last quartet. Experienced

composer at the end of his life used a new sonic system, and also radicalised the attitude towards texture, writing fragments of *Quartet No. 16* in the punctual way almost like Anton Webern. Simultaneously, he used already practised methods and ways of presenting microtones and shaping musical narration, thanks to which the work remains in his characteristic style, although it is rather a preview of the further development of harmonic style than the work crowning his output.

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