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Original Article **Научная статья**

Charles Ives — Microtonalist. Part I

Чарлз Айвз — микротоновый композитор. Часть I

JOHNNY REINHARD

Manhattan School of Music,
New York, United States of America,
afmmjr@aol.com,
https://orcid.org/0000-0003-4470-3691

ДЖОННИ РАЙНХАРД

Манхэттенская школа музыки,
г. Нью-Йорк, Соединённые Штаты Америки,
afmmjr@aol.com,
https://orcid.org/0000-0003-4470-3691

Abstract. The article presents the great American composer Charles Ives as a pioneer of microtonal music. This is in addition to his Three Piece for Two Pianos in Quartertones and amongst the sketches to his unfinished Universe Symphony (which was subsequently realized by the author of the article for a Lincoln Center premiere in 1996). In fact, Ives composed with an elaborate tuning system formed by spiraling fifths, but constituted only in his mind and through his notation. True dissonance for Ives was the result of temperament, while the tuning he imagined for his original music - even for his piano music, was meant for a microtonal design that is only being realized a century later. It is noted in the article that Ives was virtually unknown in the American musical scene during most of his lifetime, recognition having been gradually given to him towards the end of his life, while in the second half of the 20th century he was finally acknowledged as a monumental figure in American music. It has been observed and noted by many musicians that he notated the accidentals in

Аннотация. Статья представляет великого американского композитора в роли первооткрывателя микротоновой музыки. Единственные микротоновые сочинения, написанные им, это «Три пьесы для двух фортепиано в четвертитонах» и наброски к незавершённой Вселенской симфонии (впоследствии завершённой автором этой статьи для премьеры в Линкольн Центре в 1996 году). На самом деле, Айвз сочинял музыку, которая подразумевала усложнённый строй, сформированный циклом спиралевидных квинт, правда, оставшийся лишь в уме композитора и проявленный посредством нотации. Настоящий диссонанс для Айвза проявлялся в результате темпераций, в то время как строй, который он считал подходящим для его музыки, даже для фортепианных сочинений, он предполагал для микротоновой конструкции, которую откроют только спустя столетие.
В статье отмечается, что Айвз был фактически неизвестен на американской музыкальной сцене в течение большей части своей жизни, признание пришло к нему постепенно ближе к закату его дней, и во второй половине XX века он был наконец признан как значительная фигура в американской музыке. Многие музыканты

his musical scores in certain original ways, which correspond to the concord of what may also called 3-limit just intonation, and perfectly coherent from the standpoint of extended Pythagorean tuning principles. The article consists of several parts and includes analyses of the notation in prominent sections of major works by Charles Ives, including such compositions as the “Concord Sonata,” “Universe Symphony,” “Unanswered Question,” and “String Quartet #2.” Ives’s perspective for the tuning of his music was to lose all temperament by utilizing a spiral of pure perfect fifths offering as many as 28 different specific notations for particular microtonal applications. These conclusions are entirely based on the composer’s written music, his extensive writings in “Memos,” “Essays Before a Sonata,” and “Some Quarter-tone Considerations,” and general microtonal knowledge for appropriate analysis. It places Ives’s contributions in an historical context with his contemporaries, and reflects his profound debt to Hermann von Helmholtz’s On the Sensation of Tone, and to the influence of his microtonalist father, George Ives.

Keywords:

Charles Ives, American music, microtonalist, microtonality, Pythagorean tuning, spiraling fifths, Universe Symphony, Concord Sonata, aggregate chords, microtonal music

отмечали, что он записывал хроматические знаки альтерации в своих партитурах определёнными оригинальными способами, соответствующими звукорядам того, что можно назвать «трёх-лимитным чистым строем», и в полной мере совпадающими с принципами расширенного пифагорейского строя. Статья состоит из нескольких частей и включает в себя анализы нотации заметных фрагментов важнейших сочинений Чарлза Айвза, таких как «Конкорд соната», «Вселенская симфония», «Вопрос, оставшийся без ответа» и Второй струнный квартет. Идеей Айвза для строя, подходящего для его музыки, была постепенная утрата всякого рода темперации посредством спиральной последовательности чистых квинт, благодаря которой возникают вплоть до 28 различных видов нотаций для определённых микротоновых применений. Эти заключения основаны на сочинениях композитора: «Мемуары», «Эссе перед сонатой» и «Некоторые четвертитоновые рассмотрения», а также на общем знании микротоновых строев и темперации, применимых для анализа. Они помещают вклад, внесённый Айвзом, в исторический контекст его современников и отражают влияние, оказанное на него книгой Г. Гельмгольца «Учение о слуховых ощущениях» и микротоновыми идеями его отца, Джорджа Айвза.

Ключевые слова:

Чарлз Айвз, американская музыка, микротоновый композитор, микротоновость, пифагорейский строй, спиралевидные квинты, Вселенская симфония, Конкорд соната, составные аккорды, микротоновая музыка

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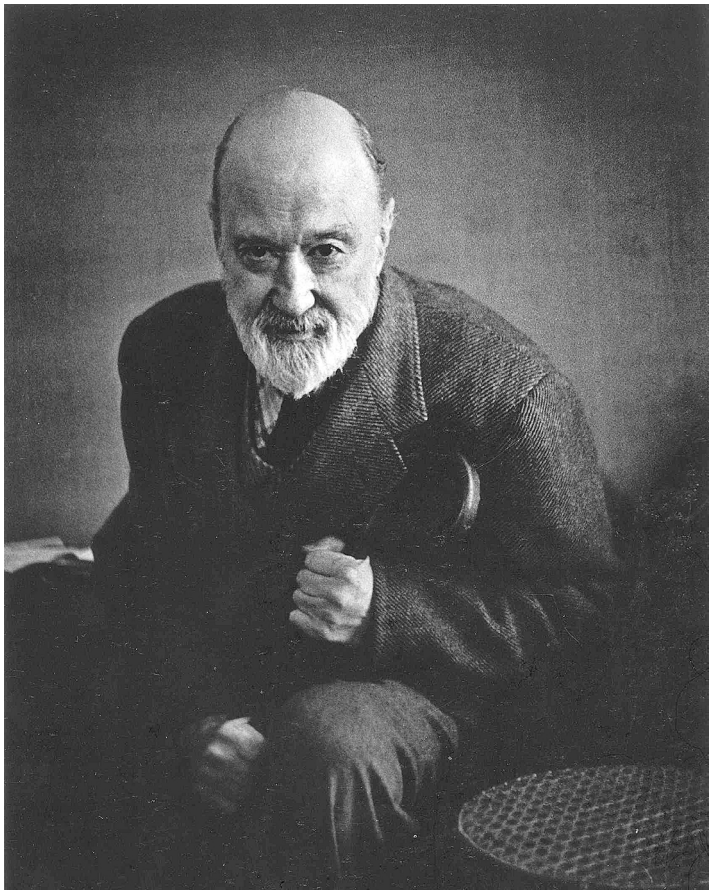

Charles Edward Ives
1874–1954

Most people do not occupy themselves with the intonational intricacies of Charles Ives (1874–1954), let alone other American microtonalists working in earnest. What of Lou Harrison, Ben Johnston, Easley Blackwood, and Harry Partch? How about Elodie Lauten, Pauline Oliveros, Harold Seletsky, Tui St. George Tucker, and James Tenney? Ivor Darreg? Julián Carrillo? The term “microtonalist” was not yet a category of musicians for at least until the last decades of the 20th Century, and these are just some of the more prominent microtonalists no longer living.

Who then might you suspect was announced as the top composer in the American field back in the 1930s? Charles Ives? No, surprisingly; he was near invisible in the music world during his composing career.

As his contemporary, the famous musicologist Charles Seeger wrote about him, “Of all the men past or present in American music, who has come nearer to filling this hypothetical position? Carl Ruggles”.[1]

Charles Seeger, the father of American musicology and ethnomusicology, and Pete Seeger, among others, might well be considered to have anticipated American microtonality: “We need at least a start toward the development of a tonal system using smaller intervals than the semitone.”[2]

While Seeger never mentioned Charles Ives in his article “Carl Ruggles” (1932),

[1] Seeger Ch. Carl Ruggles. *The Musical Quarterly*. 1932;18(4):578-592.

[2] Ibid. P. 583.

he also did not mention how he had recently been schooled in microtonality by Augusto Novaro. Recognized as a microtonal master in his native Mexico, Novaro was visiting in New York City at the time when Seeger was resident and likely regaled him with tuning matters. Charles Seeger was born in Mexico City, a city which Novaro called home. His views about the expansion of the pitch spectrum can be fathomed by these words: "Our present tendency toward the acceptance of the duodecuple scale leaves us, theoretically, with only twelve tones to the octave, obviously a serious come-down from the pitch resources during the period from 1700 to 1900, when there were certainly not less than forty or fifty to the octave."[3]

Charles Ives was then rather invisible, although Ruggles and Ives were in personal contact with each other. Ives would, as if by worldwide consensus, move into the primary position regarding Ruggles by the final quarter of the 20th century.

By the time of the American bicentennial in 1976, Charles Ives's reputation as a towering patriarch of American composition seemed solid. Leonard Bernstein called him "our Washington, Lincoln and Jefferson of music," celebrating Ives's output as "a pinnacle of the first two hundred years of this country's musical achievement."[4]

Yet when Leonard Bernstein conducted the first performance of Ives's "Symphony #2" in 1951, the composer, rather than listen in attendance, listened at home to the radio. This composition was written while Ives was still a student under the influence of his Yale music professor Horatio Parker. Ives's older brother Moss Ives commented on "Charlie's" peculiar disposition concerning attending in person other people's interpretations of their original works: "I simply cannot hear my own book preached about any more than Charlie can listen to his own music played."[5]

For Charles Ives, the microtonality was all in his head. Seriously. Henry Bellamann, Ives's good friend for over 15 years, wrote of what he learned from their time together in his essay, "Charles Ives: The Man and His Music," published in the *Musical Quarterly* (1933). "There were many discouraging and trying years; but some of the plans that seemed the most visionary and idealistic were the ones that worked out the best." Bellamann described his friend's anguish as he expressed it to him personally regarding his decision to strike a new path: "He said: 'I found I could not go on using the familiar chords only. I heard something else.' That is to be remembered. These curious harmonies were not sought out on a keyboard. They were first *heard* as appropriate expression of the musical idea."[6]

Ives walked a fine line between actually hearing the spiraling fifths tuning his writings indicate,[7] and a more psychological heightening of musical intent with an equal temperament performance. Ives had made it clear he used symbols for notation in different ways than others. In his earliest music his notation may have corresponded to equal temperament in the usual way, but as he moved on from his university training, his "sign posts" had a distinctive meaning to this imaginative sign maker. Describing the equal temperament cases, situations that would include just about everybody during his lifetime, Ives chose to go the psychological route. Ives tried to be clear

[3] Ibid. P. 587.

[4] Massey D. The Problem of Ives's Revisions, 1973–1987. *Journal of the American Musicological Society*. 2007. Vol. 60. No. 3. P. 599.

[5] Ives M. *Memories and Letters*. New York, Parabola Press, Inc., 1973. P. 249.

[6] Bellamann H. Charles Ives: The Man and His Music. *The Musical Quarterly*. 1933. Vol. 19, No. 1. P. 49.

[7] Please note: rather than employ the term "Extended Pythagorean" which comes with unnecessary baggage, the term "spiraling fifths" will be used herein for its neutrality.

about his sign posts, of what he expected players to understand when playing his music, even if it seemed somewhat counter-intuitive: “In some cases, more a help and incentive for the ear and mind to say (nearer to) what it feels. For instance, in the key of *C*, *B* going up to *C*, sometimes under certain moods, is sung (regardless of the piano) nearer to *C* than the *B* on the piano — and, going down from *C* to *Bb*, farther away.”[8]

Ives is writing in this memo as if speaking aloud to a potential client, perhaps as one makes a sale door to door for a life insurance policy. It is very matter of fact, and he is not making any fancy claims. Alternatively, Ives tried a philosophic expression, an explanation for why he believed he was obsessed with the sounds he had internalized: “That music must be heard, is not essential — what it sounds like may not be what it is.”[9]

Harry Partch (1901–1974), in contradistinction to Ives, needed to make his music manifest with carefully constructed acoustic instruments, tuned in ratio relationships based on what microtonalists call “just intonation.” As Partch himself expressed the situation, “I am no Charles Ives. I’ve got to hear in order to go on. And I’ve reached the point where any more composition is pointless, unless for some specific dramatic project” (Sept. 27, 1955 letter to Peter Yates).[10]

Partch, of course, was enmeshed in a completely different tuning paradigm, one described as a monophonic fabric of 43 notes made up of overtone and undertone series relationships through the 11th limit. Partch and Ives, at opposite poles of financial success, chose totally different mappings for their music. Both were inspired and catapulted into a lifetime of microtonal composition by the 19th century German scientist Hermann Helmholtz (1821–1894)[11].

Imagine listening to Harry Partch’s “Delusion of the Fury” or “Barstow” or “U.S. Highball” in twelve-tone equal temperament on orchestral instruments. Would it even be recognizable? Thankfully, Ives’s tuning is closer to conventional equal temperament and can suffer the difference.

Ives wrote that there was indeed a code to decipher his music to bring his music transcendentally into the future for a new audience: “Perhaps there are flashes of light still in cipher, kept there by unity, the code of which the world has not yet discovered.”[12]

Indeed, the “still in cipher” reference is found in his writings, especially his then unpublished memos, published after his great music making had ceased. His reference to being “kept there by unity” is indicative of the consistency in which Ives explains how his music had matured into a simple unity of pure fifths spiraling, using designated notations, or “sound posts” as he referred to them, to specify their unique interval makeup. Truly, Charles Ives’s insistence on pure fifths stands out historically as fifths have ever been tempered flat since meantone began at the birth of Europe’s Renaissance. Ives essentially liberated the pure fifth, now genuinely a “perfect fifth.” However, he said “no” to the 5/4 major third of the harmonic series, at least as far as his primary major third. He chose the ditone (81/64) instead, which is measured at 408 cents, while having available an alternative major third which simulates the fifth harmonic at 384 cents (e.g., *A* – *Db* = 384 cents), two cents shy of just intonation calculations.

[8] Ives Ch.E. *Memos* / edited by John Kirkpatrick. W.W. Norton, 1972. P. 189.

[9] Ives Ch.E. *Essays Before a Sonata, The Majority, and Other Writings*. Edited by Howard Boatwright, W.W. Norton, 1970. Epilogue. P. 189.

[10] Enclosures VII. *The Letters of Harry Partch, San Diego*, CA: Paragon Press, 2015. P. 324.

[11] Helmholtz H. *On the Sensations of Tone as a Physiological Basis for the Theory of Music* / Translated by Alexander J. Ellis. Longmans, Green and Co., New York, Bombay and Calcutta, 1912. P. 217.

[12] Ives Ch.E. *Essays*… P. 121.

Ives had posited about the challenge a composer would face by attempting to circumvent the "tyranny" of the fifth: "But this is doubtful; the octave and fifth are such unrelenting masters in the realm of the physical nature of sounds."[13] His acoustical plan is expressible entirely on perfect fifths above and below the note "A" as calculated in cents.[14]

Musicologist and journalist for *The New York Times*, Richard Taruskin brought me into the story as a result of my realizing a performance score of the "Universe Symphony" based entirely on Ives's extant sketches: "In their Ivesian context, the microtones link the natural past with the spiritual, if not the commercial, future. To chalk up the coincidence as another coup for the Great Anticipator might seem trivial, but it symbolizes in its way a more significant anticipation. Ives's omnivorous 'Universe,' at least as mediated by Mr. Reinhard, foreshadows today's musical scene in all its polymorphous perversity, its rejection of stingy theorizing and its re-opening to universal possibility."[15]

Relative to his peers, Ives was notorious for favoring dissonance in his compositions. Perhaps quite surprising to readers is that Ives's music is less discordant when experienced in spiraling fifths tuning than otherwise, and significantly more striking as a result of pure fifth generated tuning. Oh, there is plenty of dissonance, but on a wider scale, such as with sudden dynamic outbursts, or with the grating dissonance of temperament.

Ives's greatest microtonal call to arms is in his discussion of "uneven" intervals. Even ratios would be representative of the 5/4 major third versus the uneven 81/64 ditone. As Ives himself writes in his Memos, "The other intervals are uneven — some way out from a simple ratio 2/1 — for instance 261/712 etc. This, at first, seemed very disturbing — but when the ears have heard more and more (and year after year) of uneven ratios, one begins to feel that the use, recognition, and meaning (as musical expression) of intervals have just begun to be heard and understood. The even ratios have been pronounced the true basis of music, because man limits his ear, and not because nature does. The even ratios have one thing that got them and has kept them in the limelight of humanity — and one thing that has kept the progress to wider and more uneven ratios very slow — (it is said for the power of man's ear to stand up against the comparatively uneven 3rds, to the very even octaves and 5ths, was a matter of centuries) — in other words, consonance has had a monopolistic tyranny, for this one principal reason: — It is *easy* for the ear and mind to use and know them — and the more uneven the ratio, the harder it is. The old fight of evolution — the one-syllable, soft-eared boys are still on too many boards, chairs, newspapers, and concert stages!"[16]

To demonstrate unevenness, Ives chose the improbable ratio of 261/712 as an extreme example worthy of serious examination from among the myriad of microtonal possibilities.

Ives went comically overboard to convolute his "complex" 261/712 interval. The choice of this ratio to represent "uneven" intervals is actually a musical joke, though clearly an inside joke for the composer in his time. To unravel this pitch puzzle and better understand Ives's thinking on tuning, please bring your attention to the ratio denominator

[13] Ives Ch.E. Some Quarter-Tone Impressions. *Franco-American Musical Society Quarterly Bulletin*. March 1925. Pp. 112–114.

[14] 1200 cents to the octave is a logarithmic device to measure various ratios which otherwise could not be easily identifiable by the ratios themselves, 100 cents per semitone in twelve-tone equal temperament.

[15] Taruskin R. Classical Music; Out of Hibernation, Ives' Mythical Beast. *The New York Times*, June 2, 1996. P. 26.

[16] Ives Ch.E. *Memos*... P. 110.

of 712: it is a double of the number 356. In other words, the ratio 261/712 as expressed by Ives is an interval greater than the octave. It is also possible to interpret as a member of some kind of undertone series related set of intervals because the numerator is smaller than the denominator. Ives had demonstrated earlier that he knew the difference between complex and simple ratios because he used 2/1 as an example of a "simple ratio."[17] Simple ratios for Ives are apparently superparticular ratios of integers within the octave.

After identifying what Ives described as the "raucous" interval created by the ratio, and reducing it by an octave, one arrives at the unusual interval of 537 cents. The identified interval 261/712 never appeared in any single example of Ives's music. It certainly is not a member of spiraling fifths tuning. It's not even a higher harmonic within the 128 notes of the 8th octave of the overtone series. As a one-off, it served the composer merely as a polemic to focus the keen abilities and interests of microtonally gifted musicians.

A cello solo line in the "Universe Symphony" (measure #78 of the score) has a *Db* going up to an *F#*. The interval between these written notes in Ives's tuning context forms a melodic interval of 522 cents. (Another 15 cents larger at 537 cents, and the ratio would be the uneven ratio raised by Ives as an extreme example of an uneven ratio in Memos).

Ives indicates his acoustic model for tuning by describing his microtonal music as being "in tones," as he wrote his "Universe Symphony" was in fact a painting of the universe in tones. It seems a direct evolving of Helmholtz's translated title of his book, but now in the plural: On the Sensation of Tones, in the plural. As Ives writes in his Memoirs, "These are good evidences of how, when once one using 'tones' to take off or picture a football game for instance, [how] natural it is to use sound and rhythm combinations that are quite apart from those that would be a 'regular music.' For instance, in picturing the excitement, sounds and songs across the field and grandstand, you could not do it with a nice fugue in *C*."[18]

Professor Richard Taruskin brought this term "in tones" with its stupendous meaning to the attention of the world in his "Universe Symphony" feature in *The New York Times* on Sunday, June 2, 1996: "One fine October day in 1915, elated by the landscape of the Keene Valley in the Adirondacks, where he was visiting relatives, Charles Ives was seized with an artistic vision to set alongside Wagner's 'Ring.' He called it the 'Universe in Tones' or 'Universe Symphony.'

It would be 'a striving,' as he called it, trying frantically to capture his conception in words, 'to present and to contemplate in tones rather than in music as such, that is — not exactly written in the general term or meaning as it is so understood — to paint the creation, the mysterious beginnings of all things, known through God to man, to trace with tonal imprints the vastness, the evolution of all life, in nature of humanity, from the great roots of life to the spiritual eternities, from the great unknown to the great unknown.'"[19]

One analogous example for this concept of Ivesian sound painting is his baseball piece for piano, "Some South-Paw Pitching." The first line has no bar lines and features, as throughout the piece, chords with simultaneous sharps and flats. Starting on four B naturals on a single quarter note beat, a half-note triplet follows to evoke a baseball pitcher on the mound, first still, and then taking a wind-up pitch, before throwing the ball, which gets hit and starts the game. The publisher of the piece described the composition as an "impulsive work, composed right after a particular ball game."

[17] Ibid. P. 110.

[18] Ibid. P. 40.

[19] Taruskin R. *Op. cit*.

The title references a baseball pitcher, the individual who directs the game's action, who happens to be left-handed. The composer's role is to paint a sound picture of the game just witnessed. Ives's ears were "stretched" to imagine the bigger picture of his recent experience, one filled with the exciting sounds in the stands.

According to Ives, "If more of this and other kinds of ear stretching had gone on, if the ears and minds had been used more and harder, there might have been less 'arrested development' among nice Yale graduates — less soft-headed ears emasculated art making money.[20]

Using "in tones" for his expanded concept of tonality, he wrote of a natural "tonal diversification" to reflect his reasoning behind the surprising looking sound posts he insisted on using for his music. As Ives writes in his Memos, "The continuity of this music is more a process of natural tonal diversification and distribution than of natural tonal repetition and resolution. Often the roots or the beginning and end of a passage or cycle are not literally the beginnings or ends — but combinations of tone that can and do stand for them, if not to the eye, to the ear and mind after sufficient familiarity."[21]

Charles Ives laid it out if only one was receptive in examination. There are no keys functioning, so no starts and ends. There is no polytonality, two keys at the same time, because they sound together in a single aggregate chord with no intention for a clash but to achieve a composite, a simultaneity that rings. For those who did not care to engage with Ives, well they were simply dismissed as "Rollos" by Ives. That's a pretty large group of people, including almost everyone of his generation. According to the composer, "The more one studies and listens and tries to find out all he can in various ways, technically, mathematically, acoustically, and aurally, he begins to feel (and more than that, actually know and sense) that the world of tonal vibrations, in its relation to the physiological structure of the human ear, has unthought of (because untried) possibilities for man to know and grow by — greater and more transcendent than what has too easily and thoughtlessly been called a natural law! Just a few months' study of what can be found in the tables of acoustical vibrations — pure, tempered, differences of overtones, beats, etc. — as found in Helmholtz et al — and it will be realized that nature's laws are greater than a mere plagal cadence."[22]

Ives gave a second piece of crucial evidence, in various places, for a unified acoustical plan to be applied to the majority of his mature compositions. Besides his already explored intent of keeping sharps played higher in pitch than their corresponding flats (both psychologically and acoustically in spiraling fifths tuning), a *B#* is pitched an eighthtone higher than its neighboring C natural. In response to a spoofed "Prof. $5000" a.k.a. "Grandma Prof.," Ives castigates the "*g—d—sap!*" for objecting to "a *B#* and a *B* natural in the same chord" (Memos, p. 189). Additionally, Ives thought it significant to point out that *B* natural and *B* sharp have a harmonic relationship in a full chord. As if to personally respond to potential and recurring accusations against his use of two different B's together (both *B* natural and *B#*), Ives explained: "Now when both the two *B*'s are used in chord, there is a practical, physical, acoustical difference (overtonal, vibrational beats) which make it a slightly different chord than the *B*'s of an exact octave — and on the piano the player sees that and feels that, it goes into the general spirit of the music — though on the piano this is missed by the imaginative."[23]

[20] Ives Ch.E. *Memos*... P. 41.

[21] Ibid. P. 195 [marked January 1929].

[22] Ibid. P. 197.

[23] Ibid. P. 189.

C–G	G–D	D–A	A–E	E–B	B–F#	F#–C#	C#–G#	G#–D#	D#–A#	A#–E#	E#–B#
1	2	3	4	5	6	7	8	9	10	11	12

By continuing the spiral of fifths to *B#* from *C*, and after 12 perfect fifths have been stacked and octave displaced, *B#* is indeed an eighthtone higher than its nearest *C*.[24]

Once again, Hermann Helmholtz foretold exactly what Charles Ives would later claim for his own music in his Memos: “Hence the tone *B#* is higher than the Octave of *C* by the small interval 74/73.”[25]

Helmholtz’s English translation by Alexander J. Ellis would prove every bit as important to a young Harry Partch, albeit with different areas of interest than those that occupied Ives: “It perhaps has been the tendency in recent years to overstate Helmholtz’s contributions to music theory, or at least to emphasize the wrong ‘contributions.’ His analysis of beats is of course important, since it throws light on the determination of relative consonance, but his impatience with temperament was, in my opinion, more important — salutary and long-overdue influence ‘I do not know that it was so necessary to sacrifice correctness of intonation to the convenience of musical instruments,’ he wrote, and called the mixture stops on the equal temperament organ a ‘hellish row’ and the difference tones of Equal Temperament a ‘horrible bass’.”[26]

In a pencil addition to the cover of a copy of the “Concord Sonata,” Ives rationalized that “mind, ear, and thought don’t have to be always limited by the ‘twelve’ — for a *B#* and a *C* are not the same — a *B#* may help the ear-mind get higher up the mountain than a *C* natural always.”[27] Here we have a non-tuning system explanation for his insistence on retaining specific choices for notation spellings (contrary to the whims of his editors). But whether reflected as a genuine tuning difference with audible distinctions waiting to be heard, or only the mere psychological trappings of semantic meaning, there can be no doubt that Ives was fully aware of the difference between them. As Ives himself expressed it, “I suppose I should explain by footnotes for soft-feeted, for those who can’t see or do anything unless they have been ‘learned to’ nice in some music kindergarten for grown-ups in legs. The twelve notes in a nice well-tuned piano are ‘twelve notes’ — machine-made almost — but at present the best instrument, that is, the widest sound implement we have, for only one man to use.”[28]

“But at present” describes a condition where people like Ives can already imagine using technology and simple inventions to make their music sound as intended. Mexico’s Julián Carrillo (1875–1965) built microtonal instruments and came to New York City with some of them in 1926. Harry Partch literally buried a design for a microtonal organ in a time capsule which was retrieved ten years after his death by Jonathan Glasier in San Diego. Ives’s music clearly had a life, long after he died. As the diviner of life insurance in the United States through the company he founded — Ives & Myrick — well respected by his colleagues, Ives understood as well as anyone might

[24] An equal tempered eighthtone is technically 25 cents, while the *B#* above a *C* would be 23.5 cents. *B#* is 1.5 cents lower than an actual equal tempered eighthtone as also found in the “Universe Symphony.”

[25] Helmholtz H. Op. cit. P. 312.

[26] Partch H. *Genesis of a Music*. Da Capo Press. New York. P. 389.

[27] Ives Ch.E. *Memos*... P. 189.

[28] Ibid.

that music written down would eventually be thoughtfully and competently performed for the ages. It would come to the American Festival of Microtonal Music to create live performances of his music in spiraling fifths tuning. Performances were by world class musicians in great venues and recorded by excellent engineers. We have only to analyze them. Consider the experience a bit of reverse engineering as one theoretically analyzes a recording of music made up exclusively of untempered chords.[29] As Ives wrote, "Thus when a movement, perhaps only a section or passage, is not fundamentally based on a diatonic and chromatic tonality system, the marked notes (natural, sharp, flat) should not be taken as literally representing those implied resolutions, because in this case they do not exist. The eye mustn't guide or enslave the ear too much or entirely in all cases — any more than the hand should too readily ('easily' better word), by the way of its anatomy physiology, and its life, limited too much by custom and habit and bodily ease, should narrow (enslave? — soften? — dwarf? — emasculate? — pianoforte music — Zat's right, Rollo?"[30]

A fascinating alternative universe to Charles Ives is seen in Adam Neely's video, "Is *Cb* the same note as *B*?" Neely emphasizes in the video how the notation spelling on a piano keyboard in equal temperament still matters because of the function of the keys. Ironically, the video presented is from a "just intonation" perspective, with the ideal major third being the "even" 5/4 major third of 386 cents. Ives normally abhorred that third, referring to it as the "dol-mi-soh" triad of soft listening. Yet, Adam Neely gave good reasons for their differences, some of which applied to how Ives imagined it (except it was based on a totally different tuning paradigm). While Adam Neely presents succinctly that *Cb* is not a *B*, even on a 12-note per octave keyboard, and even calculates their cent values, Charles Ives had different cent values.

Like his hero Ralph Waldo Emerson, Ives would join the American Transcendentalists' movement by breaking away from the rules that were inherited from Germanic influence.[31] Kyle Gann described how Ives made a "complete break" from inherited tradition: "He had been taught that he must use the same chords, the same voice leadings, the same genres and forms used by the great European composers. His intuition, his psychology, his knowledge of acoustic science told him something different. He did not have to accept received authority in his field any more than the other Transcendentalists did in theirs. Like them, he had to make a complete break and rely radically on his own intuition."[32]

Musicologist Maynard Solomon referred to a letter Charles Ives is said to have read by his father to a student. Solomon was incredulous that George Ives taught his son anything remotely credited to him by his son: "Aware of the paucity of external evidence to support his claims, Ives quoted a singular letter from his father to one of his music students, in which George Ives discussed the state of contemporary music at some length: 'The older I get... the more I play music and think about it, the more certain I am that many teachers (mostly Germans) are gradually circumscribing a great art by these rules, rules, rules, with which they wrap up the students' ears and

[29] Spiraling fifths tuning can also be described accurately as "3-limit Just Intonation" in that each tone is in a relationship of integers only up to and including the 3rd harmonic.

[30] Ives Ch.E. *Memos*... P. 190.

[31] "Despite sometimes naming specific theorists, Ives seemed to have associated the 'rules' of consonant music with the more general nineteenth-century practices of teaching music theory in German (and subsequently American) conservatories" (Chelsey Hamm, pp. 98–94).

[32] Gann K. *Charles Ives's 'Concord': Essays after a Sonata*. University of Illinois Press, 2017. P. 27.

minds as a lady does her hair-habit and custom all underneath.'"[33]

Charles Ives moralized about the reception he could expect to receive from Rollos of the future. (I find it funny that he keeps bringing up the money Rollos earn undeservedly.) According to the composer, "Of course here we are referring to a kind of music that he is not much accustomed to, and which he has not trained himself to listen to and hear. What would he tell the public about what is taking place, as to its form, as to is tone-associations, as to its rhythms, as to its tonalities (poly-, a-, or others), its division of tones, as to the recurrences or sequences of the musical thought, its sound-centers, the relation of the different groups of tones and intensities, etc. etc.? In the premises, what would he do? And if he did anything, should he be justified in taking money for selling his opinion to the public? Answer, Raven — 'Nevermore.'"[34]

What is the connection between Ives and transcendentalism? Ives considered music to be itself a transcendental language: "But maybe music was not intended to satisfy the curious definiteness of man. Maybe it is better to hope that music may always be a transcendental language in the most extravagant sense."[35]

Through his wife Harmony and the extended Twitchell family, Charles Ives became reacquainted with the philosophies of transcendentalism, a literary, religious and social reform movement which flourished between approximately 1830 to 1860 in New England, and which emphasized a unity of the individual soul with nature and with the divine. A core belief is in the inherent goodness of people and nature, and that people are at their best when truly "self-reliant" and independent, which corresponds well with Ives's approach to music.

Like the philosopher Ralph Waldo Emerson, who broke away from particular religious restrictions in his Christian denomination, Ives broke away from the musical rules imparted to him by Horatio Parker at Yale University. Regarding the acknowledgement of a recognized natural law in music, Ives likely burned inside with the knowledge he possessed. This knowledge included how to hear new intervals, or at least intervals that one rarely encountered, intervals waiting to make their entrance on the world stage through eventual music performances properly in tune. Ives recognized these new realities would take more than a hundred years to be actualized by the musical public, and he was right. The easy way comes first, while the complex needs to wait for a century at least to realize. As Ives wrote, "What are the true, fundamental, natural laws of tone? The people who talk and tell you exactly what they are, who teach them explicitly, who write treatises about them — ipso facto, — know less about them than the deaf man who wonders! They measure a vibrating string and want to tie your ears to it. When it's easy to catch the vibration, then it's 'natural,' and they smile. When it's hard then they scold or get mad, or go to sleep."[36]

Ives is no doubt frustrated that so few, if any of his generation could follow him. This could be perceived in the following words: "They talk about some fundamental laws [of] sound — for instance, an obvious physical phenomenon, or rather a material arrangement of things — is 2:1 (that is, an octave). It happens to be self-evident, easy to hear and understand — but when you think of it, for some reason it is no more a fundamental law than 1:99.

"1:99 is just as fundamental and natural as 2:1. The physical movement of a string

[33] Solomon M. Charles Ives: Some Questions of Veracity. Journal of the American Musicological Society. 1987. Vol. 40, No. 3. P. 450.

[34] Ives Ch.E. *Memos*… Pp. 31–32.

[35] Ives Ch.E. *Essays*… P. 186.

[36] Ives Ch.E. *Memos*… P. 50.

vibrating or dividing into segments is but a thing the eye and ear can know and see easily. Does that make it, or not make it, a fundamental law?"[37]

The ratio 1/99 is an undertone series derived interval many octaves below a fundamental that Ives pulled out of his metaphysical hat. When it is octave displaced to a scale within an octave it is measurable at 755 cents, and corresponds to a slightly sharped quartertone, specifically an E quartertone sharp +5 cents.

Finally, Ives looks himself in the mirror, aware that he might be tone deaf to the cause of his plight. Using parenthesis to signal he is thinking to himself, Ives wrote revealingly of his situation. "(Are my ears on wrong? No one else seems to hear it the same way.)"[38] The problem with everyone else could be summed up simply as suffering from "an aural limitation," his term.[39] Rollos by definition simply do not take the necessary time to learn the new intervals with any exactitude, musical intervals such as the ditone, or learning the distinction between the two sizes of whole tones (8/9 and 9/8), or of navigating quartertones. Ives posited that a Rollo would react to the ratio 1/99 as "horrid." Ives preached to those who would possibly hear: "They assume that fundamentally all of this (music?) ought to be and supposedly is based (and therefore limited, and so weakened, but they don't say that) on their tonal habitudes, or call them the normal scales, the diatonic, tempered, major and minor scale platforms. And these resulting uses, by years of custom and habit, these chordal progressions, modulating tones rowing around them, systems of suspensions, etc., etc., assume something that in this Sonata is *not* assumed, except in a relative (analogous better word here) or occasional way."

Developing the topic further, the composer wrote, "Thus here the music naturally grows, or works naturally, to a wider use of the twelve tones we have on the piano, and from (ever in an aural kind of way) building chordal combinations which suggest or imply (and of course to the aural imagination only, when played on a piano) an aural progression which physically is not in the piano strings, may be implied by the mind-ear as a thing [of] musical sense".[40]

Ives tried to be clear, although Ives Society editor John Kirkpatrick just laughed his conviction off which he expressed to Carol Baron in a recorded interview that "pianos only have 12 notes." Essentially, Kirkpatrick was tone-deaf to the fact that he was in effect a *primo* Rollo. Charles Ives insisted otherwise to his eternal consternation: "As to the matter of implied changes in the tone of a note (usually only one or two in a chord say of from six to eight notes) which when played on a piano dos not change, but which the player can think aurally as going higher or lower, as the case may be… in many cases… (though really not an accidental, a sign for a different ratio of overtonal vibrations) is made to suggest and conform to the above theory — in other places so as not to bring to mind a tonality which does not exist, and so not feel or think about not having a key. This is so it won't mislead the eye first, then as a result also the ear and the mind et al."[41]

All throughout Ives's writings, this conveyer of life insurance thought of the future, beyond his earthly bonds. Ives's prediction is of more than a century for a time when equal division hegemony will give way to alternatives. He places the following words in parenthesis: "(Besides, I think that new scales will gradually be evolved in a natural way probably, perhaps in centuries, and that their intervals will not be (or all be)

[37] Ibid.

[38] Ibid. P. 71.

[39] Ibid. P. 192.

[40] Ibid. P. 192–193.

[41] Ibid. P. 194.

of the whole, half, or quarter tones known or so-called now.)”[42]

“Rollos” were what Charles Ives called non-microtonalists, people who could not hear let alone imagine like he could. And it appears that no one on earth could hear the way Charles Ives could hear. Music thinkers, with rare exceptions continue to think of Charles Ives in equal temperament terms as far as to assume he was using “dissonant counterpoint,” a later fashion in American composition quietly invented by Charles Seeger in 1914, and propagated several years later by his young protege, Henry Cowell, later editor of many of Ives’s works, and his first biographer. Indeed, it was later discovered that Charles Ives financed Henry Cowell’s entire professional life quietly.[43] The composer states: “There may be an analogy between (or at least similar results from similar processes of) the ear, mind, and arm muscles. They don’t get stronger with disuse. Any art or any habit of life, if it is limited chronologically to a few processes that are the easiest to acquire (and for that reason are said to be some natural laws), must at some time, quite probably, become so weakened that it is neither a part of art nor a part of life. Nature has bigger things than even-vibration-ratios for man to learn how to use.”[44]

Below are the cent calculations for notes in Ives’s music tuned in spiraling fifths:

A	*Bb*	*A#*	*Cb*	*B*	*C*	*B#*	*Db*	*C#*	*D*	*Eb*	*D#*	*Fb*	*E*	*F*	*E#*	*Gb*	*F#*	*G*	*Ab*	*G#*
0	90	114	180	204	294	318	384	408	498	588	612	678	702	792	816	882	906	996	1086	1110

To be continued

Information about the author:

Johnny Reinhard, composer, microtonal music specialist,
Master of Music Degree (MM), Manhattan School of Music;
Founder and artistic director of the American Festival of Microtonal Music (1981),
and Microtonal University (2021).

Информация об авторе:

Дж. Райнхард, композитор, специалист по микротоновой музыке,
магистр музыки, Манхэттенская школа музыки;
основатель и художественный руководитель
Американского фестиваля микротоновой музыки (1981)
и Микротонового университета (2021).

[42] Ibid. P. 111.

[43] Mead R.H. Cowell, Ives, and ‘New Music.’ *The Musical Quarterly*. 1980;66(4):538-559.

[44] Ives Ch.E. *Memos*... P. 42.