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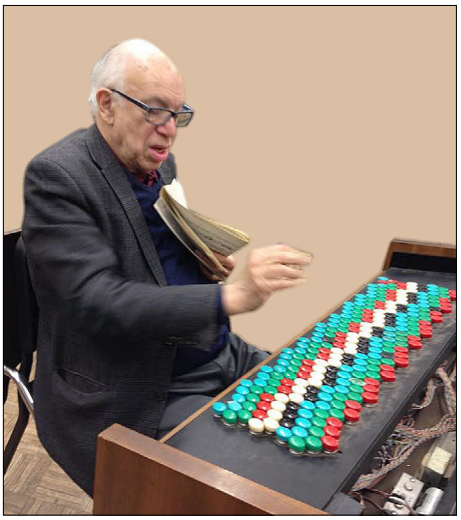
Composer and Theorist Joel Mandelbaum on Microtonality

I spent the academic year 1993–1994 in the United States, studying composition at the Graduate Center of the City University of New York. In the 1980's I had studied "spectralist" music with composer Tristan Murail in Paris, and I had used quarter-tones in some of my compositions, but my deeper interest in microtonality, various tuning systems, and Just Intonation, in particular, was only truly starting in the 1990s, and especially during my year in New York. Although I did not study with a microtonal composer, I knew of an important microtonalist who had taught the subject at Queens College, which is part of the City University of New York. His name is Joel Mandelbaum and his presence was indeed one of the reasons I had applied to this university. I had learned about him, his views, and ideas, from an article that proved groundbreaking for my development: "Six American Composers on Nonstandard Tunings" by Douglas Keislar in Perspectives of New Music (vol. 29, No. 1, Winter, 1991, pp. 176–211). Mr. Mandelbaum (b. 1932) is a highly educated, skillful composer who writes in a clear, tuneful, and accessible tonal style to which the use of microtones add an original and fascinating flavor. Unfortunately, his music, such as his important, much-acclaimed operas on Jewish subjects, is all but unavailable on recordings. Of his microtonal music, only a short electronic work in 31-tone equal temperament is available on CD ("Andante cantabile" on the compilation "Electronical," American Festival of Microtonal Music – Pitch P-200208).



Among microtonal composers and scholars of tuning systems, Joel Mandelbaum is widely known for his seminal dissertation "Multiple Division of the Octave and the Tonal Resources of the 19-tone Equal Temperament" (Ph.D. thesis, University of Indiana, 1961; available online at http://anaphoria.com/mandelbaum.html).

It turned out that Mr. Mandelbaum did not teach a class in microtonality at the time I studied at CUNY, but he kindly agreed to a meeting. I recorded his words on cassette tape; while I started by asking about his path to microtonality, and inquired about his own music, more than an interview, our rendezvous was a private lesson or lecture for an enthousiastic beginner, on the workings of the 19-tone and 31-tone equal temperaments, as well as the use of the pure intervals of the harmonic series. During the recording, I mostly kept silent, as I had in mind that I could later use it in a radio program. However, the talk concerned such a specialized subject that I gave up on that idea. Recent decades have witnessed a growing international interest in microtonality and alternative tuning systems among musicians from all genres, thanks to synthesizer and computer technology, as well as internet communities. I believe that publishing this 1994 interview now makes available a fine short introduction to a remarkable microtonal composer and theorist, and two of the most important and popular microtonal tuning systems: 19 and 31 equal divisions of the octave.

After his most illuminating talk, Mr. Mandelbaum demonstrated various intervals and tunings on his Motorola Scalatron, an early digitally retunable electronic organ, which at the time was still in working condition.

Juhani Nuorvala

Helsinki, Finland, February 1, 2018

Path to microtonality

Juhani Nuorvala: How did your interest in microtonal music begin?

Joel Mandelbaum: The origin of my interest in microtonal music is interesting in itself. I had forgotten about it. When I thought of, as any other student, doing research for a doctoral dissertation, I had been advised: "Do it in theory, not in composition." This was because even then I was writing in a very conventional style, and the fashions were very different. They said, you'll never get a job as a composer; you'll get a job as a theorist. So I had to find a theory topic, and I thought of a number of topics, and one of the things in the back of my mind was: "If I ever have a lot of time, I'd like to explore microtones." I didn't know at that moment where I got the idea, but somehow it had been there as one of several topics I proposed, and the people in Indiana University liked it better than my other topics, so I said "fine, I'll do it." Then, later on, after I had done the thesis, I discovered notes that I had taken as a freshman in college. I realized that was the source of my fascination with microtones – it was a lecture on microtones given by Paul Hindemith. He spent most of the hour describing these fascinating advocacies of microtonal tuning. During the last ten minutes he debunked them all – he didn't believe in any of them. I found the first forty-five minutes absolutely riveting and the last ten minutes totally unconvincing. So in the back of my mind I knew wanted to go through this material too. And when, finally, having to find the dissertation topic, the people at Indiana University knew about the 19-tone per octave tuning, since one of them had read Joseph Yasser. So they suggested that I explore the 19-tone per octave tuning, which was not so difficult to do: I got their harpsichord and tuned the two keyboards differently, and could experiment and started to do it. I also read their reading list and followed up their bibliographies with their reading list and read other things. It wasn't long till I decided that this was an absolutely undeveloped field, that nobody knew what anybody else was writing, and that there needed to be a kind of overall map and survey. The last reasonable survey of any sympathy had been done by Robert Bosanquet almost a century earlier. The survey made by Murray Barber had been so hostile to microtones that there was simply no real presentation of what was going on. So the thesis expanded into a survey of the entire field, and still I retained as a portion of it some theoretical exploration of 19-tone tuning, including some pieces. Among the people I researched in the thesis was Adrian Fokker in Holland, and the correspondence I got back from him was so warm and supportive and invitational that when I got a chance a few years after I finished my doctorate, I spent a summer in Holland working on the organ there and composing in the 31-tones-per-octave tuning, and I liked very much what I found and discovered. So I maintained that tie to the 31-tone people in Holland and contributed some impetus to supporting George Secor and getting the Motorola company to make some experimental 31-tone keyboards. That was before the days of the expansion of the synthesizers into microtones. We have one right across the hall here. And I wrote a set of preludes in the 31-tone scale. Then I wrote a scene from the opera I was writing from 1966 to 1971, which was a setting of *The Dybbuk*, in which the natural seventh was used consistently as a harmonic interval between the voice of the girl who is possessed and the man who possesses her. Only where that happens were microtones used, but I thought that is was effective to do that. I wrote a number of pieces – I never liked the sounds of the various organs that I used to find the pitches. So I experimented with writing for standard instruments. I found some string players could find the notes, and some couldn't, and it was a little unreliable. What I found reliable were the upper partials of the French horns, and that the flutes could maintain a fairly good scale, if you tune them about a third of a semitone flat, so that they could play seventh partials of the notes that other people had. A lot of my microtonal writing since then has focused on those instruments. For instance, I wrote a little study for woodwind quintet, where the flute was tuned flat.

19-tone equal temperament

Juhani Nuorvala: Is the reason why you use 31-equal, and is the importance of 19-equal and 31-equal that you can approximate just-intonation intervals conveniently?

Joel Mandelbaum: In 19-equal it does not work so well. The point of this scale is mostly getting new intervals into the system. The minor thirds are almost perfectly in tune in 19-tone equal temperament. The major thirds are fairly close, but they are actually smaller than pure major thirds – and we are so used to hearing major thirds larger than pure that I am not so sure it helps, and the fifths are pretty much shortened. The triads are recognizable. An

interesting experiment I did when I was doing my thesis at Indiana University, I wanted to accompany some songs. After the harpsichord we tuned two pianos, and we had singers come in and sing standard repertoire, while accompanying them with regular scales in 19-equal. And they were amazed that it wasn't so difficult. As a matter of fact, later with *The Dybbuk*, where, of course, we rehearsed with the singers with piano, and then shifted the last minute to microtonal instruments, Paul Sperry was very resistant to the change, and then when the change came, he said "this was so easy, you shouldn't have even bothered using microtones, just indicated regular notes, and it would have been the same." In fact, the intervals are not the same, but this is easy to do, because the intervals are pure. One of the things we discovered was that it was not a great burden if you used the conventional scales in 19 or 31. Singers adjust very easily to keyboard instruments that are tuned to 19 or 31. In 19, the scale wasn't improved, it was just different.

In the pieces published in my thesis (Nine Preludes for Two Pianos in 19-tone Equal Temperament, 1961), I tried to illustrate different speculations. There was a writer named Theovald Kornerup, who advocated 19-tone tuning based on the golden ratio. And so I had some golden ratio intervals, which essentially produce a sort of a very sharp E in the middle from C to C – a pitch between E and F. That makes the golden cut on the octave, a very close approximation. Following Yasser's suggestion, I built some scales according to his ideas, which sort of came down to using equivalents of whole-tone scales, and tended to create consonant and dissonant principles, in which the major second seems to come up as a consonace. I composed one piece, which I enjoyed writing, in which I set up a twelve-tone row and used the twelve tones out of 19 as a kind of tonal field. Although the piece was entirely serially created around the row, the row modulated first to closely related rows with 11 notes in common and one new, and, finally, at its climactic point, to as many new notes as possible – seven new, retaining five old pitches – and then came back. It was interesting to sort of explore the synthesis between tonal movement and serial twelve-note structures. I thought it kind of worked, but I've never done the process again. It felt quite satisfying to me. It was a very short piece. I haven't really tried my luck over a long haul. But I had a sense, when I came back at the end, that it was a rounding and a closure, which I don't usually hear in twelve-tone music. And then I took something, which was as close to the equal pentatonic as I could, but 19 isn't a multiple of five, so it wasn't equal. But it still created a kind of gamelan effect. I also wrote a few other compositions – for instance, a bitonal piece, in which the two keys were one 19th of an octave apart, and kept in a separate hand. All that was fun.

31-tone equal temperament

Joel Mandelbaum: What made 19 interesting was the extra notes and the particular relationships which they provided, whereas in 31 the charm was that the major thirds were really pure, and the natural sevenths were very close to pure too, so that you suddenly had a system in which even though you still could modulate with the freedom of equal temperament, you basically were working with the overtone series through the 12th partial, even though the 11th partial is not quite so good but it's much purer than in 12-equal. In 12-tone equal temperament 11 is a quarter-tone off, while in 31 it's pretty close – you take the note between F and F#, and you have a pretty good 11th partial of C. So up to the 12th partial the system works pretty well in 31. In no other system short of 70s or 80s you could get tuning that close [except 41-equal? – J. N.]. However, what I found in 19 was that I was using all the notes quite logically. With 31 I wasn't interested in using all the notes. I was interested in creating systems that use some of them. My own particular proclivities were harmonies with the seventh partial. One thing I liked very much was the ratio 6:7, which is a little smaller than the minor third, but a lot larger than the major second. And it is a small minor third, and three of them add up to a pure minor sixth – not a major sixth but a minor sixth! – and four of them to a major seventh. I found that this provided an interesting set of relationships, which would come with a certain surprise to the ear, and yet things would fit pretty well. I also discovered a kind of a jazzy idiom as though you had a minor third with a sort of blue note character to it, which was very attractive. So that's something I've used quite a bit in several of my pieces.

Have you met Johnny Reinhard? He is the one who keeps his attention on all the activities of the city. In any case, he asked me to write a 31-tone woodwind quintet, saying: "Just write the notes, and don't worry about how we'll play them, and we'll play them," which was a little optimistic.

It didn't quite turn out quite that well, but it was close. The horn, curiously enough, had the greatest problems doing it that way. Fairly recently I wrote a woodwind quintet entirely in 31-tone tuning, without worrying about it. (Woodwind Quintet # 2, 1991) But I found that I was using a 13-tone scale most of the time.

On the techniques of writing microtonal music

Juhani Nuorvala: Do you use Fokker's notation for 31-equal?

Joel Mandelbaum: Yes, I do. I like his notation, it makes very good sense, because it relates to the standards of intonation that existed back in the Renaissance, when F# was lower than G-flat, and everybody knew that. So semi-sharps and sesqui-sharps in this context make good sense. I think that it's a very logical notation system. I did one work for about ten instruments, including a microtonal keyboard, which was in it a little bit, but did not play a big role. And the woodwind instruments there were all instructed to play normal diatonic and chromatic music, but they had to tune in odd ways. So I could probe the pitch by the tuning. And of course the result of that was Klangfarbenmelodie, simply because in order to write a microtonal melody I had to jump from one instrument to another, and different instruments had control over different parts of the pitch spectrum. It came out experimental, but I was pleased with the results. Another work was for three horns and trombone, and the idea there was simply the upper partials. In the outer movements all the horns are in F, and everything is in sympathy, almost like a single chord all the way through the piece. In the inner movement I have one horn in F, one in E and one in C, and I go for as many microtonal pitches as I can, including some cluster chords, where all four notes are within a semitone, but all playing different pitches. The work I was describing earlier had, in addition to the woodwinds, also three string instruments including a double bass. One passage turned out remarkably well. I had a double bass solo in the middle of it in which, all of a sudden, the double bass was playing all the units of the system, a melody with the tiniest intervals, and the double bass player plays figures in one position like a violin, which is the easiest thing in the world, and something they never do, but it's perfectly natural, and it turned out very well. Each movement of that piece is based on a totally different conceptual premise, which is also the way the movements of my 19-tone composition in my thesis worked out.

Now I tend to use microtones in fragments of larger non-microtonal pieces. My opera on which I am working now (*The Village*, 1995) has two microtonal scenes out of thirteen. On certain special occasions, for instance, when a horn plays a seventh, I ask it to play a natural, flat seventh. I regard that as routine. That doesn't make the piece microtonal, but it's only when I decide to tune the flutes down, so that the whole segment is systematically lowered, that I consider it microtonal, even if it's just for the seventh chord.

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