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We Live in Waves

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WE LIVE IN WAVES
for orchestra

Composer:
WILL TRACHSEL

Submitted in Partial Fulfillment of the
Requirements for the Degree
Master of Music in Composition in the School of Music
Jordan College of the Arts, Butler University, Indianapolis, IN USA

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Will Trachsel

We Live in Waves
Will Trachsel
Dr. Michael Schelle
November 1, 2014

We Live in Waves

During the summer of 2012 I found myself watching a TED talk by the artist Reuben Margolin, entitled “Sculpting waves in wood and time.” Margolin is a kinetic sculptor whose work combines craftsmanship, engineering, and artistry to bring waves to life. Some of his sculptures are directly inspired by nature, while others are more abstract and scientific. It would be impossible to adequately describe such brilliant work in prose, so I urge the reader to type the name “Reuben Margolin” into a web browser and see the art firsthand. At the conclusion of his talk, Margolin summarizes the philosophy behind his work in the following way:

“This tension between the need to look deeper, and the beauty and immediacy of the world – where if you even try to look deeper you’ve missed what you’re looking for – this tension is what makes the sculptures move, and for me the path between these two extremes takes the shape of a wave.”

I was captivated by Reuben’s art, and by what he had to say about it. I began to research his work, watching every video I could, and listening to every interview or documentary I could find. I felt a deep connection to Reuben’s work, and after
listening to him discuss its motivation I knew I had to write a piece exploring the idea of waves.

During my childhood I spent a great deal of time on the water, so I first approached Reuben’s artwork from this frame of reference. Some of Margolin’s sculptures directly reference water in their titles, and make beautiful observations about the magic of nature. As I continued to contemplate Reuben’s words and the ideas that inspired them, I began to see waves from a broader perspective. In the natural world waves can be found in the oceans, in the wind, in topography, in weather, in seasons, and in the physics of sound and light. In all of these places we can observe the “beauty and immediacy of the world” as Reuben describes it, and yet from a more introspective point of view each of us experiences the world in a wholly different kind of wave. In a given day we experience waves of a myriad of emotions, urges, thoughts and sensations, while on a larger scale the ups and downs of our entire lives can be observed as waves of joy and sorrow, successes and failures, losses and gains, good health and illness, stress and relaxation, love and loneliness. I began to form my own relationship with the idea of waves in every aspect of existence. Margolin’s sculptures were the portal that first led me to this way of thinking, but they are no longer a necessary part of my relationship with the idea. “We Live in Waves,” certainly makes allusions to water, and it references Reuben’s artwork, but the piece goes much deeper.

Just as waves permeate every facet of our existence, I wanted waves to permeate every facet of the piece. The form of “We Live in Waves” is loosely based on the shape of a sine wave. The piece begins with softly pulsing chords. At letter
“B” the orchestration becomes richer, the dynamic range expands, and momentum builds through an extended crescendo. The first “crest” of the wave occurs at m. 64, before quickly fading away into a more subdued and intimate middle section, with the quietest point in the entire work occurring around m. 94. When similar material is passed to the low strings at rehearsal letter “F,” it is weightier, and the piece begins to crawl out of the lowest point of the trough. At G there is a sudden increase in volume, rhythmic activity, and forward motion as the piece builds towards the second, more extended crest. The loudest point in the work occurs in the first phrase of rehearsal letter “H,” marking the second crest, but this time the momentum of the work remains elevated for a longer duration before finally returning to a soft pulsing end that bears resemblance to the beginning.

My earliest experiments consisted of slowly moving canons that contained between three and ten voices imitating the principal line, which I thought would be the perfect musical analog for a wave. At any given moment different isolated points of one of Reuben’s sculptures could be found anywhere along the path of its wave, from crest to trough, in spite of its motion, and the same could be said for one of my canons. I spent a couple of months composing canons, experimenting with different numbers of voices, different kinds of themes, different rhythmic foundations, making use of canonic techniques that resembled those found in Ligeti’s "Atmospheres" and "Lux Aeterna," and much of Reich’s early work. Each canon was interesting at first, but quickly became monotonous, mechanical, and uninspiring. Thus I determined that imitation would play an important role in the work, but true canon would not serve the piece well.
After several weeks of experimentation I finally arrived at the conclusion that meticulous dynamic counterpoint, and not canon, would become the foundation of the piece. I had tried to use canon in order to imitate the shape of a sine wave, but in lieu of imitating the symmetrical crests and troughs of the waveform in each individual voice, I instead endeavored to create the impression of this waveform through the way that collections of voices interact with one another. This can be found in the very first measure of the composition (Figure 1). The violins are split into three different groups, each playing chords that begin *niente*, then crescendo to a peak before fading back into silence. The entrances of these chords, as well as the timing of the dynamic shaping, are staggered in such a way that we do not hear the entrances clearly. Rather each chord seems to emerge from the texture before sinking beneath the surface once again. This type of activity creates a slow and steady pulsing, which gives the impression of deep breathing, or the eternal rhythm of waves washing up onto the shore. This steady pulsing, while varied extensively, became the connective tissue of the piece, and can be heard in some form throughout every section of the work.

Figure 1: mm. 1-8. Dynamic “waves.”
Dynamic counterpoint served a crucial role in developing thematic material. It was also an important textural device, which I employed within the context of individual harmonic sonorities to highlight individual pitches or combinations of pitches within the texture, and also to highlight different timbres. This device allows each harmony and each collection of colors to be heard “from every angle.” One of the earliest and clearest examples of this can be found in the woodwind writing between rehearsal letters “A” and “B.” (Figure 2)

Figure 2: mm. 22-26. Dynamic counterpoint in a static texture.

The third way dynamic counterpoint was heavily used throughout the work is reminiscent of the third movement of Ruth Crawford-Seeger’s “String Quartet.” Rather than stating the thematic content of the piece entirely within 1 voice, it is often distributed between groups of voices. By using staggered dynamics, individual voices each emerge from the texture in a contrapuntal fashion, creating an intentionally ambiguous impression of a theme. The clearest example of this can be
found in the string writing at rehearsal letters “E,” (Figure 3) and “F.” My goal was to obscure the thematic material in the same way that the outline of an object becomes blurry when it is viewed through the gently rippling surface of a clear body of water.

Figure 3 mm. 81-83. Composite melody using staggered dynamics.

The opening thirty-six measures introduce the listener to many of the thematic and structural elements that become prevalent throughout the work. The violins are the main focus in the first few bars, where they introduce the slow, wave-like pulsing chords. The first five measures give the listener a chance to grow accustomed to the sound, and the slow tempo, before the winds enter. From the beginning measure we also hear a very faint suspended cymbal roll, which is present during most of the quieter sections of the work. This roll should be almost inaudible, but it provides a delicate layer of support, and fills the space between
pulses. When the cymbal roll disappears at letter “F,” the listener may have forgotten that it was there, but its absence will create a startling emptiness. The viola and cello sections become dominant in mm. 13-16 (Figure 4). The chord on the downbeat [E-F#-B] is the same as the first chord of the piece, but as violas ascend B-C#-D, and cellos descend E-D-C#, arriving at Bm1/C#, the material develops a more tragic character. I have great affection for this material, and it becomes integral later in the piece.

Figure 4: mm. 13-17. Viola and cello motive.

At letter A, the woodwinds introduce dynamic phasing within a static chord for the first time. The flute sextuplets in m. 27, and clarinet sextuplets in mm. 32-33 also create a subtle “gurgling” in the background, creating motion in spite of the very slow tempo (Figure 5). The harp follows suit with the flute and clarinet, commenting three times following prominent melodic fragments. These textural elements foreshadow the prominently featured vibraphones, piano, and harp at
letter B. Another important characteristic of this moment is the way in which the melodic fragments interact with each other (Figure 6). Each voice has a similar rhythmic structure, and each voice presents a melodic fragment that feels incomplete in isolation. However, each fragment is interrupted by the next voice before it has reached its conclusion, thus creating a continuously flowing stream of melodic ideas.

Figure 5: m. 27. "Gurgling" flutes.

Figure 6: mm. 28-31. Fragmented melodic orchestration.

Upon arriving at letter B, the entire string section continues to provide a pulsing foundation, but the nature of the pulsing changes. Each chord enters in
layers, and each layer grows louder and softer independently from the rest of the texture. The low voices enter first, then gradually the chord seems to transform as the low-mid voices, then the high-mid voices, and finally the highest voices emerge from within the texture. By the time the highest voices begin to fade away, the lowest voices of the next chord have already entered. This creates a steadily rolling texture of harmonies that seem to be getting louder and softer, ascending and descending simultaneously. I took great care in selecting a chord progression that creates forward motion and builds tension, but that does not clearly imply functional harmony. The woodwind section at letter “B” supports the material in the strings by creating secondary motion within the harmonic texture, and adding coloristic variety.

Figure 7: mm. 37-43. Four simultaneous soloists.

The most prominent voices at B are the two vibraphones, the piano, and the harp, each of which are featured as soloists at the same time. They have rhythmically active material, which they are instructed to play flexibly, and their entrances are staggered in the same way that the melodic fragments at A were, so
that the four soloists constantly interrupt each other (Figure 7). Since they are not
playing in rigid tempo, and their instruments are all bright timbres, the result is a
steady stream of shimmering and colorful activity supported by the ever-flowing
waves of string harmony in the background. Two measures before letter “C,” the
woodwinds gradually begin to steal the foreground, providing even more
rhythmically active material. The flowing harmonies become more intense, the
winds and some of the violins produce a cloud of chattering 32\textsuperscript{nd} notes, and the
brass are briefly featured to add weight to the build. The brass here also foreshadow
the more heavily brassy orchestration of the second large build to letter H. The
entire orchestra builds to a peak at m. 64, before gradually fading away. When the
last chattering woodwinds fade away in m. 66, all that remains is the soft pure tone
of bowed crotale and vibraphone supported by a quiet suspended cymbal roll.

The first wave comes crashing down just before rehearsal letter “D.” The
sparse and delicate atmosphere that follows creates a dramatic contrast,
introducing the middle third of the work. The section opens with an exact repetition
of the material presented by viola and cello in mm. 15-17, before continuing to
develop this material until letter “F.” The incredible ability of string instruments to
blend with one another made them an ideal voice to explore this material. With such
a monochromatic orchestrational pallet, each voice seamlessly emerges from the
texture before retreating below the surface. I wanted the multitude of overlapping
hairpins to create a rippling effect, obscuring the shape of the melodic line (Figure
8). This material is perhaps the most directly related to Margolin’s sculptures. It was
for this reason that I chose to use only the string section until letter “E.” At m. 94 the
flute and keyboard colors join the texture once again, offering some variety after two minutes of strings. Despite the more colorful orchestration, mm. 94-97 are the softest point of the entire composition.

Figure 8: mm. 89-91. Overlapping violin motives.

Rehearsal letter "F" marks a number of subtle, yet significant changes. By this point the listener has forgotten that there is a very soft suspended cymbal roll in the background, but when it stops at letter "F" it leaves behind a noticeable emptiness. High voices have largely dominated the texture since "D," but at "F" the cellos and basses become the focus. The key signature also changes here, with F-sharp and C-sharp becoming natural. The lowering of these two pitches enhances the "lowness" of this section. The harmonic language becomes more dissonant, and muted violins introduce very soft, very high pedal tones. This gulf of several empty octaves between the soft violins and the dark, dissonant low strings enhances the sense of heaviness and desolation.

Letter G begins with a splash. There is a dramatic change in rhythmic activity, volume, and density of orchestration. Vibraphone, harp, horn in F, double reeds, and suspended cymbal punctuate the downbeat with a sustained chord. The violins, keyboards, and harp create an active backdrop; each voice playing fragmented moving lines that overlap in such a way that the motion is continuous. At first only
eighth notes are present, but triplets, sixteenth notes, and thirty-second notes are gradually introduced to the texture, intensifying the rhythmic activity. The build to letter “H” is similar to the previous build, but there are some key differences. The flute, oboe, and clarinet prepare the listener for the theme at “H” by introducing obscure fragments of this theme in the preceding measures (Figure 9). The harmonic language employed by the low strings and winds to create “pulsing wave chords” is both darker and less stable than the previous build, and the brass section is more heavily featured. In fact, the trumpets take the foreground in the final measures before the massive impact at letter “H.”

Figure 9. mm. 132-136. Fragmented foreshadowing of “H” theme.

Rather than crashing down and fading away, the second build culminates in a powerful unison melody (Figure 10), initially orchestrated in flute, oboe, bassoon, piano, violin, and cello, while a brass chord on the downbeat accentuates the first note of the tune. The violin and cello sections continue the tune, while the flute and oboe rejoin the rest of the wind section playing rapid passagework to create additional motion. Meanwhile, the brass, bassoon, viola, and contrabass provide supporting harmonic material. Just as the impact of this unison arrival begins to
wane, the entire brass section takes up the overlapping wave texture, supported by similar material in viola, cello, and bass. While the brass and string sections are both involved in the wave texture, they are slightly offset rhythmically, so that each section retains it's own identity. Shortly thereafter, melodic counterpoint returns on a much broader scale than can be found previously in the work.

Figure 10: mm. 146-155. Primary climactic theme.

The most actively contrapuntal section of the piece – and incidentally the section most closely related to my earliest canonic sketches – begins at letter “I.” In the earliest drafts of this section, the melodic content was orchestrated much more heavily in the brass, and used strict imitation within section of the orchestra. It used the stratification of a two opposing canons in horn and trumpet respectively, while the low brass provided supporting harmonic material. Once the rest of the piece had been written it became apparent that this version of the material would be too jarringly different in comparison with the rest of the piece. The regularity of the rhythm, the strictness of imitation and repetition of material, as well as the heavily brassy, fanfare-like orchestration had to be re-written to better serve the piece as a whole.
I used the canon as a blueprint to compose new lines, each of which only contained fragments of the theme. By carefully planning which voices would play which notes I was able to present the melodic material in a way more closely related to the dynamic counterpoint found earlier in the work. The same overall intervallic content is present, but the texture is less cluttered. I also reconsidered the orchestration, making use of the entire orchestra to create a lush, full, more colorful sound than the original version. My final alteration was to adjust the rhythmic structure. The original canonic version was heavily downbeat oriented, and this created an undesirably rigid feeling. By displacing entrances, and augmenting or diminishing certain rhythms, particularly in the imitative voices, I was able to create a more naturally flowing, less regimented temporal structure. The melodic writing in this section, particularly the trumpet theme in mm. 182-189 (Figure 11), is an intentional nod to the music of Aaron Copland, whose work had been very dear to me for several years even before I began to study with one of his former students.

Figure 11: mm. 182-189. Implied canon, nod to Copland.

The pulsing chords return to the low strings one final time at letter “L.” The violins create motion using similar material to their parts at “G,” while the piano,
vibraphone, and crotales add a delicate layer of color in the background. These three voices occasionally land on pitches unrelated to the harmonic texture, thus creating a hint of unrest throughout an otherwise peaceful conclusion (Figure 12). The effect is subtle, but noticeable. Suspended cymbal and marimba also return at “L” to provide another soft, yet shimmering color to the texture. The metallic instruments during this final section are intended to evoke the impression of the soft glimmer of moonlight dancing around the surface of a gently rippling pool. The piece ends almost as it began, with gently swelling chords in the string section. This time the primary chords are played by viola, cello, and bass, while the violins fill in the space between these chords with waves of their own. These waves gradually fade away, leaving complete silence when a solo violin releases its final note. The waves have not stopped; they have simply become inaudible. This is not a resolution.

Figure 12: mm 190-194. Textural elements of the conclusion.
We Live in Waves

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Instrumentation:

3 Flutes  
(1st doubling piccolo)
3 Oboes
3 Clarinets in B-flat  
(1st doubling E-flat)
2 Bassoons
Contra Bassoon

4 Horns in F
4 Trumpets in C
2 Tenor Trombones
Bass Trombone
Tuba

4 Percussion
(2 Vibraphones, Crotales [2 octaves], Sus Cymbal, Crash Cymbals,
Bass Drum, Tam-Tam, Mark Tree)

Harp
Piano

Violin 1
Violin 2
Viola
Cello
Contrabass

Transposed Score

Duration: c. 17 Minutes

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On Performance

Relative Dynamics

Dynamic indications such as "pp" will sometimes indicate that pianissimo is the overall character and volume design throughout the entire orchestra. At other times, such dynamic indications refer to relative volumes within a given section, or the shape of an individual performer’s phrase. The context of each dynamic indication should inform performers which way to interpret them at any given point.

Dynamic Phasing

Dynamic phasing between individual players, and between whole sections of the orchestra is a crucial aspect of the entire work. The numerous hairpin indications throughout the score must be followed exactly. At many times, dynamic shaping of individual parts is intentionally out of sync to create a desired effect. As with other dynamic indications, these hairpins quite often show the relative balance between individual players, as well as balance between sections. The success of the piece largely relies on the proper execution of these hairpin indications. If there is no beginning dynamic indication preceding a crescendo, or no final indication following a diminuendo, "niente" is implied.

Dynamic phasing is used to achieve multiple effects at various times throughout the work:
- Dynamic phasing creates shifting color within a static texture. (e.g. woodwinds in m. 24)
- Dynamic phasing distributes various notes of the thematic material between different players, thus creating an impression of melody. (e.g. violins in mm. 81-86)
- Dynamic phasing creates perpetually flowing waves of harmony, providing the music with its forward momentum. (e.g. strings at "C")

"Freely"

Any time an individual part is indicated "freely," the performer may stretch rhythms expressively, as would a soloist. Performers should not stray too far from the conductor's beat, and performed rhythms should closely resemble those written on the page, however these parts should not be played rigidly in time. For example, the two vibraphones, harp, and piano at letter "B" are free to interpret their solos with more rubato than would usually occur in an orchestral set. Likewise the flutes at m. 26 (or any time this gesture returns) should play the precise number of notes indicated, and begin and end the gesture at the correct time, however the sextuplets should begin slightly under tempo, gradually accelerate to the peak of the crescendo, then slightly slow again. The interpretation of sextuplets in this gesture may vary from player to player.

"Gradually slowing, out of time" *

In m. 64 several parts contain stemless noteheads in boxes, with the indication "gradually slowing, out of time." Performers should begin repeating notes in the exact order they are indicated. These notes should begin at approximately the same speed as the 32nd notes that preceded them. They are then repeated continuously, gradually slowing down no regard for the conductor or other players. Once the horn section reaches the peak of their crescendo in m. 65, all players with the "gradually slowing" indication should begin to diminuendo. When an individual player is ready to drop out of the texture, they must move seamlessly from the repeated notes to the stemless noteheads in m. 66. The stemless notes in m. 66 should be played only once, and should fade to silence. The order in which players drop out is unimportant but all players must drop out sometime during the final 5 seconds of the effect. The final speed of each player should no faster than 16th notes, and no slower than 8th notes relative to the speed of the original 32nd notes. The result should be a cloud of rapidly chattering notes with no discernible tempo or meter. this cloud gradually slows and fades until nothing remains but the the bowed metallic percussion. The entire effect, from the downbeat of m. 64 to the beginning of the fermata in m. 66, will require more time than the actual number of beats indicated, and should last between 15 and 20 seconds.

Breath Marks

There are many breathmarks notated throughout the score, particularly in the string section. These indicate a brief break in the sound, but not a pause in the forward progress of the music. Tempi should not be affected.

— Will Trachsel, 2014

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poco rit.