Expanding and Contracting

Expanding and Contracting is a meditative work that happens to have intricate mathematical processes underlying it. There is no need to be aware of these processes in order to experience the piece – perhaps they will even inhibit your enjoyment of it – so feel free to stop reading now and just sit back and let the piece wash over you. Or, it might work best to sit back and listen first, then come back and read these notes after you hear it.

But for the brave and/or musically/mathematically geeky souls out there who are interested in knowing the processes, you may continue reading. The piece is in three parts and the instrumentation is open-ended; one part is for any keyboard, strummed, or mallet instrument(s); another part is for any treble melodic instrument(s); and the third part is for any two drums of indefinite pitch. Each part rhythmically expands for the first half of the piece and then contracts for the second half, but each does this according to a different mathematical pattern.

The keyboard/strummed/mallet part is in an undulating eighth-note pattern throughout, moving through a sequence of seven chords. The first iteration is a sequence of only the first two of these chords, but each iteration thereafter adds one more chord on the end until it reaches all seven chords. Not only does it expand by adding one more chord each time, but the number of beats that each chord lasts also increases by one prime number each time, and each chord lasts a number of beats that is a prime higher than the previous chord in the sequence. This process peaks at 37 beats for the 7th chord in the series, and then the process runs in reverse, with each iteration articulating one fewer chord, and each chord in the iteration lasting one prime number of beats shorter than the previous.

The treble melodic part undergoes a somewhat similar process, but using the Fibonacci series instead of prime numbers. The Fibonacci series is a pattern found frequently in nature in which the next number in the set is the sum of the previous two numbers in the set (1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, etc.). The treble melody part consists of an ascending scale, starting with three pitches and adding one pitch each time it starts over from the bottom. The number of beats of each pitch follows the Fibonacci series, with each new melodic pitch lasting the number of beats of the next number in the series. The length of rests in between each iteration of the melody also increases along the Fibonacci series. This goes up to 55 beats on the highest note reached and then the process runs in reverse, with the melody moving in retrograde, descending and contracting.

The drum part starts with three increasing squares of eighth note groupings (2 sets of 2, 3 sets of 3, 4 sets of 4), and then increases arithmetically, peaking

at groupings of 10 eighth notes before running in reverse.

This may all sound very abstract and intellectual, but my ear and intuition were always closely involved in the compositional process. The processes weren't an abstract and pre-determined imposition, but rather grew out of compositional experiments and tests as I worked on the piece and tried different combinations of processes. I also cheated ever so slightly in the middle of the piece, making small adjustments to the numbers to make sure that the different strands came together in the manner I wanted at the end of the piece. Still, this whole approach (in which I had a calculator close at hand throughout the compositional process, and worked with graph as well as manuscript paper) is unlike any piece I've composed before or since (I am usually a quite intuitive composer). What I find most remarkable and beautiful about this work is that, unlike any other piece I've composed, even to me, the composer, it is mysterious and utterly unpredictable every time I hear it.