SYMPHONY

by

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A DISSERTATION
Presented to the School of Music and Dance
and the Graduate School of the University of Oregon
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“Symphony,” a dissertation prepared by Justin Morell in partial fulfillment of the requirements for the Doctor of Philosophy degree in the School of Music and Dance. This dissertation has been approved and accepted by:

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Title: SYMPHONY

Approved: _________________________________________________  Dr. Robert Kyr

Throughout history, wondrous discoveries of science, like great pieces of music, have often come about through extraordinary feats of creativity, informed by deep rational thought yet not limited by it. Like science, music composition requires a mastery of its own technical features (instrumentation, orchestration, harmony, counterpoint, etc.), but neither music nor science can flourish when too much emphasis is placed upon the mechanical and not enough on the imagination.

Composers have sometimes turned to mathematics as a tool for generating art though the systematization of musical elements. However, music often suffers from the conscious attempt by composers to bring it closer to the world of science and math through the serialization of musical material. This does not mean that mathematics and science do not play an important part in music of great expression. To be sure, composers have used simple mathematical concepts to discuss, analyze, and create music at every stage, whether consciously or unconsciously, since the beginning of Western music.
These ideas are at the very heart of the great music of previous centuries, even if we celebrate those works more for their intrinsic beauty than their rational mechanics. It is the inventiveness and creativity that we find easy to value in music, but the science behind it also makes its creation possible.

My symphony pays tribute to the marriage of creativity, not process, in scientific and musical thought, using the words of scientists and mathematicians as poetic texts, which generate musical imagery. I have chosen a series of quotations by notable scientists and mathematicians throughout history, which serve as textual introductions for each movement of the six-movement, approximately forty-five minute orchestral symphony. Each quotation makes reference to a specific scientific or mathematical discovery of its writer, or displays an aspect of his philosophy. The ideas expressed in the quotations serve as abstract inspiration and suggest musical imagery for each respective movement.
CURRICULUM VITAE

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INSTRUMENTATION

2 Flutes (second doubles Alto Flute and Piccolo)
2 Oboes (second doubles English Horn)
2 Bb and A Clarinets (second doubles Bass Clarinet)
2 Bassoons

4 Horns
2 C Trumpets
3 Trombones
Tuba

Timpani
Percussion 1: Drum Set, Triangle, Tambourine
Percussion 2: Vibraphone, Xylophone, Glockenspiel

Electric Guitar (with delay, volume pedal, tremolo)
Piano
Strings
DRUM SET KEY

- Bass Drum
- Snare Drum
- Suspended Cymbal
- Sizzle Cymbal
- Hi-hat
- Hi-hat pedal (closed)
- Hi-hat pedal (open)
- Tom-tom
- Floor-tom
NOTES

The drum set must include the following: bass drum, snare drum, two tom-toms, hi-hat, cymbals. It is recommended that the drum sizes and tunings resemble those of a standard jazz drum set, which would normally include a 12” tom-tom, a 14” floor-tom, an 18” or 20” bass drum, a 20” riveted ride-cymbal, and a medium crash-cymbal. Larger drum sizes will likely result in sounds atypical to the style of the piece and out of balance with the dynamics of the ensemble. In addition to the jazz bass-drum, a larger bass drum may be added for sections of the piece in which a more traditional concert bass-drum sound is desired. This would require an additional pedal setup.

The Percussion 2 should stack the glockenspiel above the xylophone, since these instruments are played in close succession.

The Electric Guitar requires an amplifier of small to moderate size, preferably with one or two ten-inch speakers and fifteen to thirty watts of power (for example, a Fender Vibrolux). A semi-acoustic or traditional jazz guitar will most effectively capture the range of sounds required for the symphony.

Movements III & VI (ending): Portions of the score have improvisatory passages with chord symbols specified in the piano part. Ideally, the pianist should have some experience with jazz improvisation. Otherwise, the solo passages may be played by the guitarist, and the pianist may follow the guitar cues to accompany the guitar soloist.

Movement III: Measures 1-10 serve as an interlude between the second and main
portion of the third movement. It may be extended as long as desired, but in order to prevent it from overshadowing the mood of the remainder of the second movement its overall dynamic level should never rise above medium-soft. Likewise, its texture should remain fairly sparse. The drum set part may be played literally in measures 1-10, or it may be slightly elaborated if the drummer has the stylistic expertise to do so. The conductor may give the rhythm section (piano, guitar, bass, and drum set) a tempo cue, but during this introductory passage, it should begin and play without the conductor.

Movement VI: The passage between rehearsal letters R and Z should not be conducted except for the cues for entrances and dynamics. The ensemble should adhere strictly to the rhythm section for tempo.

The total duration of the work is 42'40"-46'55", and the timing of each movement is as follows:

I. 10'10"
II. 5'45"-8+
III. 5'
IV. 5'15"
V. 6'30"
VI. 10'-12+
The diagram below is one possible stage plan. Others may be used, but it is most important that the piano, drum set (Percussion I), basses (especially amplified bass if used), and guitar are placed in close proximity.

Please note: Except for the bass section, which must be placed with Percussion I, piano, and guitar, the strings may sit in the conventional placement for orchestra.
“Natural selection acts only by taking advantage of slight successive variations; she can never take a great and sudden leap, but must advance by short and sure, through slow steps.” (Charles Darwin, in *Origin of Species*)
A little more intense

Fl.

Eng. Hn.

Cl.

Vib.

Tuba

Pno.

Vls.

Vc.

Bsn.

Thm.

Tuba

Pno.

E.C.B.

A little more intense

Vln.
Broadly, boldly
With heavy accent—but bouncy
*Note: All single-stemmed note pairs in viola to be played divisi, mm. 241-259.
A bit brighter, lighter

\[ z = 58 \]

```
\begin{align*}
\text{Vln. I solo} & \\
\text{Perc. 2} & \\
\text{Bsn.} & \\
\text{E.Gtr.} & \\
\text{Hn.} & \\
\text{Pno.} & \\
\text{Vla.} & \\
\text{Vc.} & \\
\end{align*}
```

Neck p.u.

A bit brighter, lighter

\[ z = 58 \]

```
\begin{align*}
\text{Vln. I solo} & \\
\text{Vln. II} & \\
\text{Vla.} & \\
\text{Vc.} & \\
\text{Cn.} & \\
\end{align*}
```

A bit brighter, lighter

\[ z = 58 \]

```
\begin{align*}
\text{Vln. I solo} & \\
\text{Vln. II} & \\
\text{Vla.} & \\
\text{Vc.} & \\
\text{Cn.} & \\
\end{align*}
```
MOVEMENT II

“THE IMPORTANT THING . . .”

“The important thing is to know how to take all things quietly.” (attributed to Michael Faraday, source unknown)
Quiet, but always intense

tempo = 120

Flute

Oboe

Bassoon

Horn

Trumpet

Trombone

Tuba

Timpani

Percussion 1

Percussion 2

Electric Guitar

Piano

Violin

Viola

Cello

Contrabass
More flowing
Timp.
Perc. 1
Perc. 2

229

Perc. 1
Perc. 2

237

Vln.

237

Q

Q

Vb.

Q

Vb.
MOVEMENT III

“NATURE USES AS LITTLE AS POSSIBLE . . .”

“Nature uses as little as possible of anything.” (Johannes Kepler, in Harmonices mundi)
Still, lyrical (Meas. 1-10 not conducted)

\[ \text{Still, lyrical (Meas. 1-10 not conducted)} \]

\[ \text{Still, lyrical (Meas. 1-10 not conducted)} \]

\[ \text{Still, lyrical (Meas. 1-10 not conducted)} \]
rit. molto 

B a tempo

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MOVEMENT IV

“THE ETERNAL SILENCE . . .”

“The eternal silence of these infinite spaces frightens me.” (Blaise Pascal, in *Pensées*)
M Gently, as before
Building intensity
Suddenly violent
Suddenly bold, but fading . . .

Tuba

Timp.

Perc. 1

Perc. 2

E.Gtr.

Tuba

Timp.

Pno.

Vln.

div. a 2

Pno.

Vla.

Vc.

Ob.

Cl.

Hn.

Tpt.

Bsn.

Tbn.

Suddenly bold, but fading . . .
MOVEMENT V

“EVERY SENTENCE I UTTER...”

“Every sentence I utter must be understood not as an affirmation, but as a question.”

(attributed to Niels Bohr, source unknown)
Very Slowly—with patient, long breaths

\( \text{Very Slowly—with patient, long breaths} \)

\( \text{Very Slowly—with patient, long breaths} \)
“Physics constitutes a logical system of thought which is in a state of evolution, whose basis (principles) cannot be distilled, as it were, from experience by an inductive method, but can only be arrived at by free invention.” (Albert Einstein, in *Physics and Reality*)
Frantic!—and a steady wall of sound

Frantic!—and a steady wall of sound
A glassy reflection of the past
hold back a bit
Just a bit slower than before—like pebbles dropped in a pond
Heavy, but not slowing down
Still heavy, and building...
Perc. 2

Hn.

Ob.

Tuba

Cb.

Vc.

Vln.

Timp.

pull ahead slightly

pull ahead slightly

neck pick up dry

pull ahead slightly

original tempo

original tempo

neck pick up dry

pull ahead slightly

original tempo
Steadily, lighter

Steadily, lighter

136

Fl. 1

Obo. 1

Cl. 1

Bsn.

Ob.

Cl.

Hn.

Tbn.

Tuba

Flp.

Ps. 1

Ps. 2

E.Gtr.

Perc. 1

Perc. 2

Timp.

Vln.

Vcl.

Vc.

Ct.
In strict tempo, but a bit agitated (no accent on \( \text{ff} \))

- Fl
- Ob.
- Cl.
- Bsn.
- Vln.
- Pno.
- Perc. 1
- Perc. 2
- E.Gtr.
- Vla.
- Vc.
- Cb.
- Hn.
- Tbn.
- Vln.
- Pno.
- Fl.
- Ob.
- Cl.
- Bsn.
- Hn.
- Tbn.
- Vln.
- Pno.

In strict tempo, but a bit agitated (no accent on \( \text{ff} \))
Rigidly (follow drums for tempo)

Fl. 1

Ob. 1

Cl. 2

Bsn. 2

Perc. 1

Perc. 2

E.Gtr.

Vla.

Vc.

Cb.

Fl.

Ob.

Cl.

Hn.

Tpt.

Tbn.

Vln.

Pno.

Ob. 2

Cl. 2

(Violin)

(Bass line for cue only)

Begin solo

Rigida

(follow drums for tempo)
S Repeat ad-lib (approx. 4x, but possibly more)

227
Y Repeat ad-lib (approx. 2 to 4 times), winding down

226

Z

237

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APPENDIX
LIST OF QUOTATIONS

“Natural selection acts only by taking advantage of slight successive variations; she can never take a great and sudden leap, but
must advance by short and sure, through slow steps.” (Darwin, Charles. Origin of Species. Edited by Gillian Beer. Oxford:
Oxford University Press, 1996.)

“The important thing is to know how to take all things quietly.” (attributed to Michael Faraday, chemist and physicist, source
unknown)

“Nature uses as little as possible of anything.” (Kepler, Johannes. Harmonices mundi. Translated by E. J. Aiton, A. M. Duncan

“The eternal silence of these infinite spaces frightens me.” (Pascal, Blaise. Pensées. Translated by Honor Levi. Edited by

“Every sentence I utter must be understood not as an affirmation, but as a question.” (attributed to Niels Bohr, physicist, source
unknown)

“Physics constitutes a logical system of thought which is in a state of evolution, whose basis (principles) cannot be distilled, as
it were, from experience by an inductive method, but can only be arrived at by free invention.” (Einstein, Albert. “Physics and
Reality.” Translated by Jean Piccard. Journal of the Franklin Institute 221 (March 1936): 348-382.)