

Frontenac Axis

Flute

Oboe

Clarinet (B^b)/Bass Clarinet

Real-time Computer System (optional)

Commissioned by Musica Nova

Sherbrooke, Quebec

Bruce Pennycook

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2000

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Flute, Oboe, Clarinet / Bass Clarinet
Real-time computer system (optional)

© Bruce Pennycook
Montreal, January 2000

Program Notes

The title, *Frontenac Axis*, is the formal name for the geological formation known as The Thousand Islands that stand in the St. Lawrence River and effectively link the Cambrian Shield with the Appalachian Mountains. It is a knot of ancient rock that crosses the great river just downstream from Kingston, Ontario and, though stable for hundreds of years, could be the origin of a colossal and devastating geological event at any time. This region has been a fertile zone of conflict and resolution, war and peace, trade and barriers and, in many ways, forms a kind of metaphor the entire composition. All of these powerful symbols - geographical, historical, political, cultural, and temporal - will be freely associated with powerful symbols in the musical work by forming a set of counter-opposed axes of tension through dissimilarity and concurrence. The ensemble consists of a standard woodwind trio (flute, oboe, clarinet/bass clarinet) forming one axis realized through tightly bound counterpoints and advanced computer-controlled and generated electroacoustic forces forming another axis - traditional (historical) orchestral instrumental gestures vs. digital signals emanating from loudspeakers.

Composer Biography

Bruce Pennycook was born in Toronto (1949) and pursued music composition and electroacoustic music at the University of Toronto and Stanford University (DMA, '78). Since his earliest recording activities in the late 1960's, he has maintained a career as composer, new music and jazz performer, author, music and audio systems developer, inventor, and professor. Pennycook has been a guest artist and lecturer in Canada, Mexico, the U.S. and has published numerous papers from his research in music and audio informatics. He is currently Vice-Principal of Information Systems and Technology at McGill University in Montreal.

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Technical Requirements

Computer System

PowerPC G3 Computer with 64 Mb DRAM
SuperCollider 2.2.4 Software (www.audiosynth.com)
Axis Software (B. Pennycook and Mark Ballora)

Audio System

stereo channel sound reinforcement system
minimum 2 concert hall type loudspeakers (4 in an arch behind the trio is better)
3 contact or air microphones (tight mic on all instruments)
mixer: 3 mic inputs from instruments
instrument mix for the hall (pan according to placement on stage)
Mono send to Macintosh Audio Line In
2 channels from Macintosh Audio Line Out

<http://www.brucepennycook.info>
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Axis - 1. Beginning (flute alone)

Bruce Pennycook

♩ = 60

Flute

accel.
pp *sfz* *ppp* *mp*
SI *a tempo*

Fl

pp *cres*
tr tr

Fl

tr *mf* *ppp*
rit. 3

Fl

pp *a tempo*

Fl

pp *accel.*

Fl

ff *ppp* *a tempo*
no vib (whisper)
gliss

2
Fl *accel.*
pp lip gliss

Fl (slight vibrato)
cres

Fl *ppp* *ppp*

Fl *accel.* *a tempo*
tr *sfz*

Fl *slower* *accel.*
pp *ff*

Fl *slower* *accel.*
ppp *accel.*

Fl

Fl

a tempo *accel.*

tr *tr* *tr* *tr* *tr* *tr* *tr*

sfz *sfz* *sfz* *sfz* *sfz* *sfz* *sfz*

Fl

tr *tr* *tr* *tr* *tr* *tr* *tr* *tr*

sfz *sfz* *sfz* *sfz* *sfz* *sfz* *sfz* *sfz*

Fl

a tempo *flz* *flz* *flz*

sffz *sffz* *sffz*

Fl

slower *accel.*

pp *ff*

2 minutes

2. Axis I

Bruce Pennycook

1 $\text{♩} = 80$

Flute *nervously* *p*

Oboe *cantabile* *ff* *sffz* *p*

Clarinet *mp*

System **H** **C**

This system contains the first two measures of the piece. The tempo is marked as quarter note = 80. The Flute part begins in measure 2 with a melodic line marked 'nervously' and 'p'. The Oboe part has a rest in measure 1, followed by a dynamic shift from 'ff' to 'sffz' in measure 2, and then 'p'. The Clarinet part has a rest in measure 1 and begins in measure 2 with a melodic line marked 'mp'. The System line shows a treble clef and common time signature.

3

Fl

Ob

Cl *3*

Sys **H**

This system contains measures 3 and 4. The Flute part continues with a complex melodic line. The Oboe part has a rest in measure 3 and begins in measure 4 with a melodic line. The Clarinet part has a triplet of eighth notes in measure 3, indicated by a bracket and the number '3', and continues with a melodic line in measure 4. The System line shows a treble clef.

5

Fl

Ob

Cl

Sys

p

cres

6

Fl

Ob

Cl

Sys

f

f

7

Fl

Ob

Cl

Sys

This system of musical notation covers measures 7 and 8. It features four staves: Flute (Fl), Oboe (Ob), Clarinet (Cl), and System (Sys). The Flute part begins at measure 7 with a sixteenth-note scale ascending from G4 to D5, marked with a slur and a sharp sign. The Oboe part has a whole note G4 in measure 7 and a whole note G4 in measure 8, with a slur spanning both. The Clarinet part has a whole rest in measure 7 and a sixteenth-note scale from G4 to D5 in measure 8, marked with a slur and a sharp sign. The System part has a double bar line in measure 7. A dynamic marking of *p* is placed below the Clarinet staff in measure 8.

8

Fl

Ob

Cl

Sys

This system of musical notation covers measures 8 and 9. It features four staves: Flute (Fl), Oboe (Ob), Clarinet (Cl), and System (Sys). The Flute part begins at measure 8 with a quarter-note scale from G4 to D5, marked with a slur and a sharp sign. The Oboe part has a quarter-note G4 in measure 8, followed by a triplet of quarter notes (A4, B4, C5) in measure 9, marked with a slur and the number '3'. The Clarinet part has a whole rest in measure 8 and a quarter-note G4 in measure 9, marked with a slur and a sharp sign. The System part has a double bar line in measure 8.

9

Fl

Ob

Cl

Sys

This system contains measures 9 through 12. Measure 9 shows a Flute (Fl) staff with a whole rest, followed by a quarter rest, and then a half note G4 with a dynamic marking of *mf*. The Oboe (Ob) staff has a half note G4 with a slur over it. The Clarinet (Cl) staff has a half note G4 with a slur over it, followed by a half note F#4, and then a half note E4. The System (Sys) staff has a double bar line. Measure 10 shows the Flute staff with a half note G4, a quarter rest, and then a half note G4 with a slur over it. The Oboe staff has a half note G4 with a slur over it. The Clarinet staff has a half note G4 with a slur over it, followed by a half note F#4, and then a half note E4. The System staff has a double bar line. Measure 11 shows the Flute staff with a half note G4, a quarter rest, and then a half note G4 with a slur over it. The Oboe staff has a half note G4 with a slur over it. The Clarinet staff has a half note G4 with a slur over it, followed by a half note F#4, and then a half note E4. The System staff has a double bar line. Measure 12 shows the Flute staff with a half note G4, a quarter rest, and then a half note G4 with a slur over it. The Oboe staff has a half note G4 with a slur over it. The Clarinet staff has a half note G4 with a slur over it, followed by a half note F#4, and then a half note E4. The System staff has a double bar line.

10

Fl

Ob

Cl

Sys

This system contains measures 13 and 14. Measure 13 shows the Flute (Fl) staff with a half note G4, a quarter rest, and then a half note G4 with a slur over it. The Oboe (Ob) staff has a half note G4 with a slur over it. The Clarinet (Cl) staff has a whole rest. The System (Sys) staff has a double bar line. Measure 14 shows the Flute staff with a half note G4, a quarter rest, and then a half note G4 with a slur over it. The Oboe staff has a half note G4 with a slur over it. The Clarinet staff has a whole rest. The System staff has a double bar line.

11

Fl *f*

Ob

Cl *mf*

Sys

This musical score block covers measures 11 and 12. It features three staves: Flute (Fl), Oboe (Ob), and Clarinet (Cl). The Flute part begins in measure 11 with a forte (*f*) dynamic, playing a melodic line with a slur over measures 11 and 12. The Oboe part has a single note in measure 11 and a half note in measure 12. The Clarinet part plays a melodic line in measure 11 with a mezzo-forte (*mf*) dynamic, followed by a rest in measure 12. The system (Sys) staff shows a double bar line at the end of measure 11.

12

Fl *ff*

Ob *ff*

Cl *ff* *mp*

Sys

This musical score block covers measures 12 and 13. It features three staves: Flute (Fl), Oboe (Ob), and Clarinet (Cl). The Flute part has a fortissimo (*ff*) dynamic, playing a half note in measure 12 and a half note in measure 13. The Oboe part has a fortissimo (*ff*) dynamic, playing a half note in measure 12 and a half note in measure 13. The Clarinet part plays a melodic line in measure 12 with a fortissimo (*ff*) dynamic, followed by a rest in measure 13, and then a melodic line in measure 14 with a mezzo-piano (*mp*) dynamic. The system (Sys) staff shows a double bar line at the end of measure 12.

13

Fl

Ob

Cl

Sys

Musical score for measures 13-14. The Flute (Fl) and Oboe (Ob) parts feature long, sustained notes. The Clarinet (Cl) part has a complex rhythmic pattern with a triplet of eighth notes. The System (Sys) part has a double bar line.

14

Fl

Ob

Cl

Sys

p

mf

Musical score for measures 14-15. The Flute (Fl) part has a melodic line starting with a piano (*p*) dynamic. The Oboe (Ob) part has a long note. The Clarinet (Cl) part has a melodic line with accents. The System (Sys) part has a double bar line. The dynamic *mf* is indicated at the end of the Clarinet part.

15

Fl

Ob

Cl

Sys

p

p

17

Fl

Ob

Cl

Sys

pppp

ppp

3. Flow (oboe alone)

Bruce Pennycook
Montreal Jan. 2000

0 $\text{♩} = 120$ *accel.*
Oboe *pp sfz ppp mp*

3 $\text{♩} = 180$ *legato*
Ob *mf*

6
Ob *mf*

9
Ob *ff mp*

12
Ob *f*

15
Ob *f*

18
Ob *p*

21
Ob *f*

2

24
Ob *sfz* *ff*

27
Ob *ff*

30
Ob *ff*

32
Ob

35
Ob

38
Ob *f*

41
Ob *mp*

44
Ob *rall.*

47 *allargando* 3

Ob

mf

51 *accel.*

Ob

sfzp *mf*

54 $\text{♩} = 160$

Ob

fff

58 *rapidly* , *Moderato*

Ob

mp

61

Ob

mp

65 *rit.*

Ob

mp

segue to IV

4. Axis II (trio)

Bruce Pennycook
Montreal 2000

1 $\text{♩} = 100$ *cantabile*

Flute *ff* *sfz p*

Oboe *p*

Clarinet *ff* *p*

System **C**

3

Fl *p*

Ob *p*

Cl *p*

Sys **C**

5

Fl

Ob

Cl

Sys

Musical score for measures 5-6. The Flute (Fl) part begins with a melodic line starting on a dotted quarter note. The Oboe (Ob) and Clarinet (Cl) parts play a rhythmic accompaniment of eighth notes, featuring a sextuplet (6) and a triplet (3) in the first measure. Dynamic markings include *mf* and *pp*. The system (Sys) is marked with a double bar line.

7

Fl

Ob

Cl

Sys

cresc

Musical score for measures 7-8. The Flute (Fl) part continues with a melodic line, marked with a triplet (3) and a sextuplet (6). The Oboe (Ob) and Clarinet (Cl) parts continue with their rhythmic accompaniment, also marked with triplets (3) and sextuplets (6). The word *cresc* (crescendo) is written above the Oboe and Clarinet parts. The system (Sys) is marked with a double bar line.

9

Fl

Ob

Cl

Sys

11

Fl

Ob

Cl

Sys

13

Fl

Ob

Cl

Sys

ff

dim

15

Fl

Ob

Cl

Sys

p

p

3

6

3

6

17

Fl

Ob

Cl

Sys

Musical score for measures 17-18. The Flute (Fl) part features a long slur over measures 17 and 18, with notes on the staff. The Oboe (Ob) and Clarinet (Cl) parts have triplet and sextuplet figures. The System (Sys) part is empty.

19

Fl

Ob

Cl

Sys

Musical score for measures 19-20. The Flute (Fl) part features a slur over measures 19 and 20, with notes on the staff. The Oboe (Ob) and Clarinet (Cl) parts have sextuplet figures. The System (Sys) part is empty.

20

Fl

Ob

Cl

Sys

23

Fl

Ob

Cl

Sys

fff

fff

fff

25

Fl

Ob

Cl

Sys

Musical score for measures 25-27. The Flute (Fl), Oboe (Ob), and Clarinet (Cl) parts are shown. The Flute and Oboe parts feature long, sustained notes with slurs. The Clarinet part has a few notes in the first measure and a long note in the second measure. The System (Sys) part is empty.

28

Fl

Ob

Cl

Sys

ff

ppp

ff

ppp

ff

ppp

Musical score for measures 28-30. The Flute (Fl), Oboe (Ob), and Clarinet (Cl) parts are shown. Each part features a sixteenth-note run in the first measure, marked *ff*, followed by a triplet in the second measure, marked *ppp*. The System (Sys) part is empty.

30

Fl

Ob

Cl

Sys

Musical score for measures 30-31. The Flute (Fl), Oboe (Ob), and Clarinet (Cl) parts are shown in treble clef. Measure 30 features a triplet of eighth notes (F#4, G4, A4) followed by a quarter rest, and a sextuplet of eighth notes (F#4, G4, A4, B4, C5, D5) followed by a quarter rest. Measure 31 features a sextuplet of eighth notes (F#4, G4, A4, B4, C5, D5) followed by a quarter rest. The System (Sys) part is empty.

31

Fl

Ob

Cl

Sys

mf

sfz

sfz

mf

Musical score for measures 31-32. The Flute (Fl), Oboe (Ob), and Clarinet (Cl) parts are shown in treble clef. Measure 31 features a sextuplet of eighth notes (F#4, G4, A4, B4, C5, D5) followed by a quarter rest. Measure 32 features a half note (F#4) followed by a quarter rest. The Flute part has a dynamic marking of *sfz*. The Oboe part has a dynamic marking of *mf* for the first eighth note and *sfz* for the second eighth note. The Clarinet part has a dynamic marking of *sfz* for the first eighth note and *mf* for the second eighth note. The System (Sys) part is empty.

32

Fl

Ob

Cl

Sys

Detailed description: This system contains measures 32 and 33. The Flute (Fl) part starts with a dotted quarter note on G4, followed by a sixteenth-note run: G4-A4-B4-C5-D5-E5-F5-G5. The Oboe (Ob) part has a dotted quarter note on G4, followed by a sixteenth-note run: G4-A4-B4-C5-D5-E5-F5-G5. The Clarinet (Cl) part has a dotted quarter note on G3, followed by a sixteenth-note run: G3-A3-B3-C4-D4-E4-F4-G4. The System (Sys) part is empty.

34

Fl

Ob

Cl

Sys

mp

mp

mp

Detailed description: This system contains measures 34, 35, and 36. The Flute (Fl) part starts with a dotted quarter note on G4, followed by a triplet of eighth notes: G4-A4-B4. The Oboe (Ob) part has a dotted quarter note on G4, followed by a triplet of eighth notes: G4-A4-B4. The Clarinet (Cl) part has a dotted quarter note on G3, followed by a long slur over the next four notes: G3-A3-B3-C4. The System (Sys) part is empty. Dynamics include *mp* for Flute, Oboe, and Clarinet.

37

Fl

Ob

Cl

Sys

39

Fl

Ob

Cl

Sys

ppp

ppp

41

Fl

Ob

Cl

Sys

Musical score for measures 41-42. The Flute (Fl), Oboe (Ob), and Clarinet (Cl) parts are shown. Measure 41 features a triplet in the Flute and Clarinet. Measure 42 features sextuplets in the Flute and Clarinet. The Flute and Clarinet parts end with a sforzando (*sfz*) dynamic. The Oboe part has a single note in measure 42. The System (Sys) part is empty.

43

Fl

Ob

Cl

Sys

Musical score for measures 43-45. The Flute (Fl), Oboe (Ob), and Clarinet (Cl) parts are shown. Measure 43 features a sixteenth-note run in the Flute and Clarinet. Measure 44 features a sixteenth-note run in the Flute and Clarinet. Measure 45 features a sixteenth-note run in the Flute and Clarinet. The Flute and Clarinet parts end with a fortissimo (*ff*) dynamic. The Oboe part has a single note in measure 43. The System (Sys) part is empty.

46
Fl
Ob
Cl
Sys

ffff
ffff
ffff
ffff
ffff

sffz
sffz
sffz
sffz

Detailed description: This system contains measures 46, 47, and 48. Measures 46 and 47 are marked with *ffff*. In measure 48, the woodwinds transition to *sffz*. The woodwinds (Flute, Oboe, Clarinet) play a melodic line with a rising eighth-note pattern. The strings play a simple accompaniment.

49
Fl
Ob
Cl
Sys

molto rit
a tempo
pp
a tempo
pp

ffff
ffff
ffff
ffff
ffff

tr
tr
tr
tr

Detailed description: This system contains measures 49, 50, and 51. Measure 49 is marked *molto rit* and *ffff*. Measures 49-50 feature trills (*tr*) on the woodwinds. Measure 51 is marked *a tempo* and *pp*. The woodwinds play a descending eighth-note figure with trills. The strings play a simple accompaniment.

52

Fl

Ob

Cl

Sys

ff

ff

ff

Detailed description: This is a page of a musical score, page 14, starting at measure 52. It features four staves: Flute (Fl), Oboe (Ob), Clarinet (Cl), and System (Sys). The Flute, Oboe, and Clarinet parts are written in treble clef. The Flute and Oboe parts have a long slur over the first two measures, with a fermata over the second measure. The Clarinet part also has a slur and fermata. In the third measure, all three woodwind parts enter with a forte (*ff*) dynamic. The Flute and Oboe parts play a series of eighth notes with accents (>) and breath marks (v). The Clarinet part plays a similar pattern but with a different rhythmic grouping. The System part consists of a single staff with a double bar line at the beginning and a few notes in the second and third measures. The page ends with a double bar line at the end of the third measure.

5. Coelescense (Clarinet)

Bruce Pennycook

Clarinet $\text{♩} = 60$ mysteriously

pp *fp*

Cl

rapid trem. gradually slower

multiphonic (ad lib) multiphonic (ad lib)

fp *mp* *pp*

Cl

multiphonic (ad lib) very rapidly

ppp *sfzp* *ff* *ppp*

3X repeat, become more erratic

Cl

ppp *sfzp* *ff* *ppp*

Cl

ppp *sfzp* *ff* *ppp*

Cl

molto accel.

mf *f*

2

Cl

ff

slower

Cl

pp

Cl

3X repeat, become more erratic

sfzp

trm

trm

slowly **molto accel.**

Cl

ppp

Cl

sus.

fff

Cl

multiphonic (ad lib)

sim. - new multiphonic each time

4x repeat to fade

To Bass Clarinet

pp

system continues

6. Axis III (trio)

Bruce Pennycook
2000

♩ = 96

1

Flute

Oboe

Bass Clar

System

slurred

p

p

sfz

system - from #5

ff

3

Fl

Ob

B. Cl

Sys

6

6

6

6

4

Fl Flute part with sixteenth-note sextuplets. Ob Oboe part with rests and a melodic phrase. B. Cl Bass Clarinet part with a long note. Sys System part with a bar line.

5

Fl Flute part with sixteenth-note sextuplets. Ob Oboe part with rests and a melodic phrase. B. Cl Bass Clarinet part with a note and a rest. Sys System part with a bar line.

6

Fl Flute part with sixteenth-note sextuplets. Ob Oboe part with rests and a melodic phrase. B. Cl Bass Clarinet part with a note and a rest. Sys System part with a bar line.

7

Fl

Ob

B. Cl

Sys

This system contains measures 7 and 8. The Flute part (Fl) features a descending sixteenth-note scale with a slur and a '6' fingering, followed by a triplet of eighth notes and another sixteenth-note scale with a '6' fingering. The Oboe part (Ob) has a descending sixteenth-note scale with a slur and a '6' fingering, followed by a half note and a quarter note. The Bassoon part (B. Cl) has a dotted quarter note, followed by a half note with an accent (>) and a slur, and then a half note. The System part (Sys) shows a drum set icon and a bar line.

8

Fl

Ob

B. Cl

Sys

This system contains measures 8 and 9. The Flute part (Fl) has a continuous sixteenth-note scale with slurs and '6' fingerings. The Oboe part (Ob) has a half note, followed by a slur over a quarter note and a half note, and then a quarter note. The Bassoon part (B. Cl) has a long, sustained note with a slur. The System part (Sys) shows a drum set icon and a bar line.

9

Fl

Ob

B. Cl

Sys

This system contains measures 9 and 10. The Flute part (Fl) has a continuous sixteenth-note scale with slurs and '6' fingerings. The Oboe part (Ob) has a whole note with a slur and a '6' fingering. The Bassoon part (B. Cl) has a long, sustained note with a slur. The System part (Sys) shows a drum set icon and a bar line.

10

Fl

Ob

B. Cl

Sys

11

Fl

Ob

B. Cl

Sys

12

Fl

Ob

B. Cl

Sys

slurred

13 *rit.*

Fl

Ob

B. Cl

Sys

15 *a tempo*

Fl

Ob

B. Cl

Sys

18

Fl

Ob

B. Cl

Sys

21 *cres.* 7

Fl

Ob

B. Cl

Sys

23 *ff* *ff* 6

Fl

Ob

B. Cl

Sys

24 6 6

Fl

Ob

B. Cl

Sys

25 slurred 3 6 6 6

Fl *p*

Ob

B. Cl 3

Sys

26 6 6 6 6

Fl

Ob 7

B. Cl 3

Sys

27 6 6 6 6

Fl

Ob 7

B. Cl

Sys

28

Fl

Ob

B. Cl

Sys

29

Fl

Ob

B. Cl

Sys

30

Fl

Ob

B. Cl

Sys

10

31

Fl

Ob

B. Cl

Sys

ff

ff

ff

This system contains measures 31 and 32. The Flute part features sixteenth-note sixteenth-note triplets, each marked with a '6' above it, indicating a sixteenth-note triplet. The Oboe and Bass Clarinet parts play whole notes. The dynamic marking *ff* is present for all three parts. The System part shows a bar line.

32

Fl

Ob

B. Cl

Sys

This system contains measures 33 and 34. The Flute part continues with sixteenth-note sixteenth-note triplets, each marked with a '6' above it. The Oboe and Bass Clarinet parts play whole notes. The System part shows a bar line.

33

Fl

Ob

B. Cl

Sys

This system contains measures 35 and 36. The Flute part continues with sixteenth-note sixteenth-note triplets, each marked with a '6' above it. The Oboe and Bass Clarinet parts play whole notes. The System part shows a bar line.

34

Fl

Ob

B. Cl

Sys

6

6

6

6

35

Fl

Ob

B. Cl

Sys

6

6

6

6

36

Fl

Ob

B. Cl

Sys

6

6

Musical score for measures 37-38. The score includes staves for Flute (Fl), Oboe (Ob), Bassoon (B. Cl), and System (Sys). Measure 37 features a Flute part with a grace note and a sixteenth-note triplet. The Oboe and Bassoon parts play a sixteenth-note triplet. Measure 38 continues the triplet in the Oboe and Bassoon parts. The System staff shows a drum pattern.

Musical score for measures 39-40. The score includes staves for Flute (Fl), Oboe (Ob), Bassoon (B. Cl), and System (Sys). Measure 39 features a Flute part with a grace note and a sixteenth-note triplet. The Oboe and Bassoon parts play a sixteenth-note triplet. Measure 40 continues the triplet in the Oboe and Bassoon parts. The System staff shows a drum pattern. Dynamics include *rit.* and *p*.