

Black Onyx

The Human Brain on Music and Sound

MFA Simon Fraser University
Music Psychology Graduation Project

2018

Aryan B

Instrumentation:

Prelude

Flute

First Movement

ViolonCello

Second Movement

Grand Piano

Flute:**General:**

j.w - jet whistle

Violon Cello**Prelude:**

play with molto rubato

Electronic music with no meter and sense of rhythm will be playing alongside like a backing track

General:

all "x" noteheads mean mute the strings with the left hand while col legno
to get a percussive sound (no pitch whatsoever)

First Movement:

Measure 88 onwards - go back and forth muting the strings and letting the
chord sound with col legno without changing the finger position.

Normale noteheads should have clear pitch

Easure 98 and 99: that beam indicates gradually bringing the bow behind the bridge
let it ring out a lot while maintaining the rhythm

Second Movement:

arpeggiated gestures introduced first on measure 10 - do not kill the sound immediately,
let it ring slightly

Grand Piano:**General:**

all "x" noteheads mean tap the exposed strings with palm of hand while depressing
the pedal (let it ring out)

all cluster chords are white note clusters

First Movement:

Chord first introduced on measure 53 - is simply an arpeggio
written with grace notes for the ease of reading

Measure 138 onwards are explained in the score

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The Human Brain on Music and Sound

Prelude

Instrumentation:

Solo ViolonCello
Flute (Tacet)
Grand Piano (Tacet)

Black Onyx

The Human Brain on Music and Sound

Prelude:

Aryan B

$\text{♩} = 54$
molto espressivo rubato

Violoncello

p *f*

3

3

3

6

8

mf

11

ff gliss

13

mf *f* 3

15

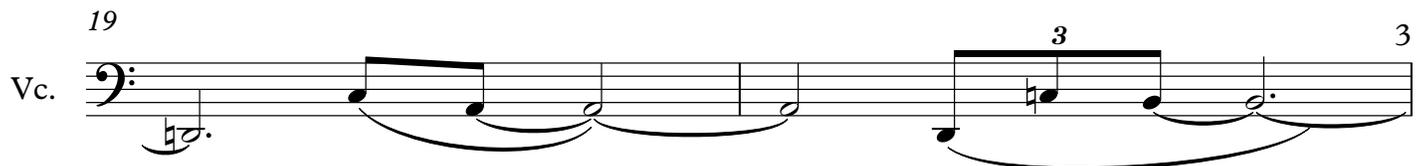
3

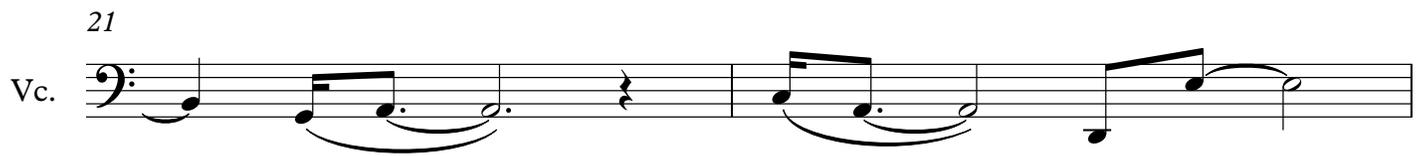
17

gliss gliss

molto dolente

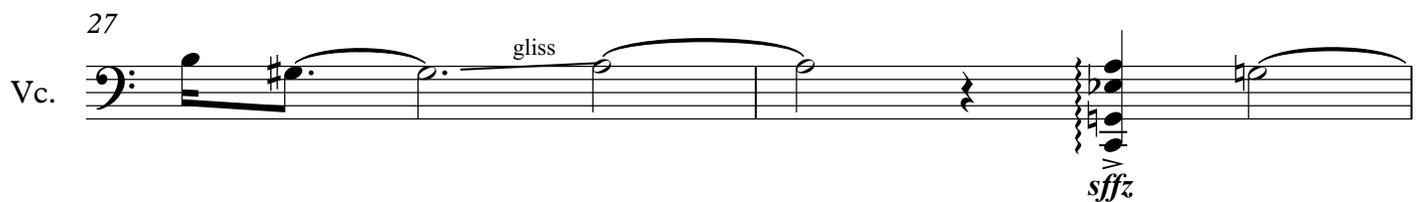
mf

19 Vc. 

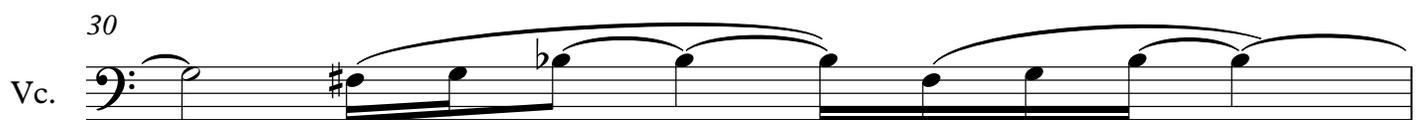
21 Vc. 

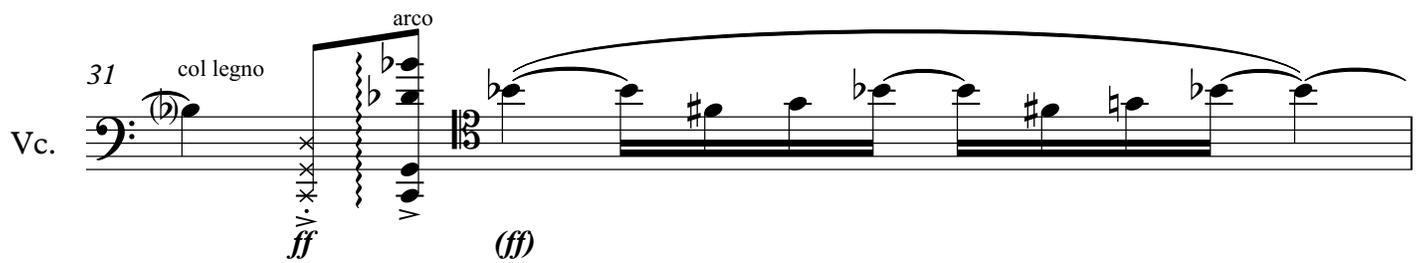
23 Vc. 

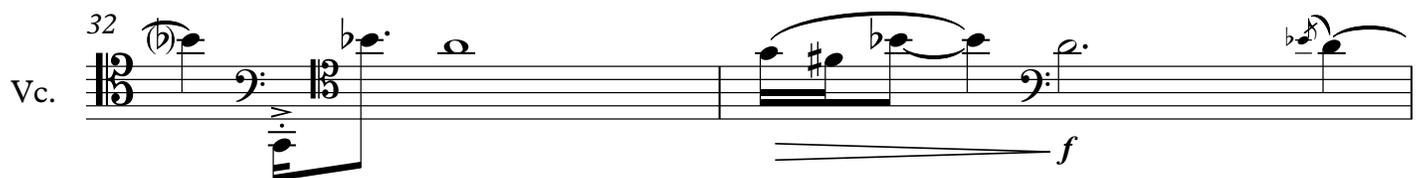
25 Vc. 

27 Vc. 

29 Vc. 

30 Vc. 

31 Vc. 

32 Vc. 

4 34

Vc.

36

Vc.

gliss

molto vib

col legno behind bridge

molto rit.

let ring

ff

mp

Black Onyx

The Human Brain on Music and Sound

Movement I

Instrumentation:

ViolonCello

Grand Piano

Flute (Tacet)

Approximate duration 10 min 30 sec

Black Onyx

The Human Brain on Music and Sound

Movement I:

Aryan B

A

$\text{♩} = 60$
molto dolente sempre

The musical score is written for Violoncello (Vc.) and Piano (Pno.). It begins in 5/4 time with a tempo of 60 beats per minute and the instruction "molto dolente sempre". Section A starts with a box around the letter 'A'. The piano part features a "mf pedal ad lib" instruction. The score is divided into four systems, with measures 4, 7, and 10 marked at the beginning of each system. The Vc. part includes dynamic markings like *pp* and *f*, and performance directions such as "gradually towards molto vib" and "molto espressivo". The piano part includes dynamic markings like *p*, *mp*, *mf*, and *f*. The score concludes with a 3/4 time signature.

13 3

Vc.

Pno.

16

Vc.

Pno.

gliss

19

Vc.

Pno.

mp *mf*

22

Vc.

Pno.

f *mp* *f*

25

Vc.

Pno.

28

Vc.

Pno.

31

Vc.

secco

Pno.

34

Vc.

rit. *a tempo*

p

Pno.

rit. *a tempo*

mp *p*

B
37

Vc. *mp*

Pno. *mp*

40

Vc. gliss

Pno.

43

Vc. gliss

Pno.

46

Vc. gliss

Pno. *f* *8^{vb}*

49

Vc. *mf* gliss 3

Pno. *mp* *f* *mp* 3

(8)-----

52

Vc. gliss # gliss

Pno. *p* *sfz* *p*

55

Vc.

Pno. *pp* *p*

58

Vc. pizz strum with thumb let ring *f* pizz strum with thumb let ring

Pno. *pp* *f* *mp* Ped.

60

Vc. *pizz* 3 *(pizz)* *let ring* *f*

Pno. *mp* *p* *f* *8^{vb}*

62

Vc. *(pizz)* 3 *mf* *sfz*

Pno. *mp* *mf*

65

Vc. *(pizz)* *f* *arco molto espressivo* *mf* *f*

Pno. *mp* *mf*

68

Vc. *(mp)* *(mf)*

Pno. *(mp)* *(mf)*

8 71

Vc.

Pno.

74

Vc.

Pno.

sul G

77

Vc.

Pno.

3

p

t.h

mf

f

tr

80

Vc.

Pno.

col legno let ring

mf sfz

f

tr

p

f

83 pizz strum quick strum with fingernail pizz strum with thumb col legno let ring

Vc.

Pno.

mf *ff* *tr* *f*

85 col legno pizz strum slow with thumb on the sustained chords quick strum with fingernail

Vc.

Pno.

mf

87

Vc.

Pno.

f *mp*

D

88 col legno with partial wood

Vc.

Pno.

p *mp* *f*

10 90

Vc.

mf *f*

Pno.

tr

8^{vb}

92 with the wood part of the bow

Vc.

f

Pno.

ff

3

8^{vb}

94

Vc.

Pno.

tr

mf *ff*

8^{vb} *mf* *sfz*

96

Vc.

Pno.

f

3

98 11

Vc.

Pno.

100

Vc.

Pno.

(white note cluster)

tr

mf *ff* *f*

mp

102

Vc.

Pno.

104

Vc.

Pno.

106

Vc.

Pno.

tr

mp

f

mf

E

108

Vc.

Pno.

arco martele secco

(white note cluster)

ff

E

110

Vc.

Pno.

gliss

molto vib

ff

F

112

Vc.

Pno.

gliss

senza vib

fff

fff molto intenso

F

114

Vc. *gliss*

Pno.

Detailed description: This system covers measures 114 and 115. The Violin (Vc.) part begins with a glissando (gliss) over a whole note chord, followed by a melodic line of eighth notes. The Piano (Pno.) accompaniment consists of two staves. The upper staff features arpeggiated chords with a rhythmic pattern of eighth notes. The lower staff has a bass line with eighth notes and some rests.

116

Vc. *gliss* *espressivo con vib*

Pno. *f*

Detailed description: This system covers measures 116 and 117. The Violin (Vc.) part features a glissando (gliss) over a whole note chord, followed by a melodic line with expressive vibrato (espressivo con vib). The Piano (Pno.) accompaniment consists of two staves. The upper staff features arpeggiated chords with a rhythmic pattern of eighth notes. The lower staff has a bass line with eighth notes and some rests.

118

Vc.

Pno.

Detailed description: This system covers measures 118 and 119. The Violin (Vc.) part features a melodic line of eighth notes. The Piano (Pno.) accompaniment consists of two staves. The upper staff features arpeggiated chords with a rhythmic pattern of eighth notes. The lower staff has a bass line with eighth notes and some rests.

120

Vc.

Pno.

Detailed description: This system covers measures 120 and 121. The Violin (Vc.) part features a melodic line of eighth notes. The Piano (Pno.) accompaniment consists of two staves. The upper staff features arpeggiated chords with a rhythmic pattern of eighth notes. The lower staff has a bass line with eighth notes and some rests.

122

Vc.

Pno.

124 *secco*

Vc.

Pno.

126 *gliss*

Vc.

Pno.

128

Vc.

Pno.

130

Vc.

Pno.

132

Vc.

Pno.

tr

pedal softly hold till measure 137

f

133

Vc.

Pno.

fff

mf

G

135

molto intenso

mf

tr

G

Pno.

Vc. *gliss*

Pno. *gliss strum with fingernail apply written density*
p ————— *ff*
scratch the lower strings with finger nail apply written density
mf ————— *p*
 Ped.

Vc. *let ring through this bar*

Pno. *scratch the lower strings with finger nail apply written density*
p ————— *mf* *p* ————— *mf*

Vc. *3* *f* ————— *mf* *gliss*

Pno. *mf*

Vc. *f* ————— *mf*

Pno. *gliss strum with fingernail apply written density*
p ————— *ff*

Ped.

145

Vc. *3* *3* *7*

Pno. *mp* *Red.*

scratching sounds with fingernails

147

Vc. *f* *mf*

Pno. *ff* *mf*

149

Vc. *3*

Pno. *ff* *mp*

gliss strum with fingernail apply written density

tap with palm of hand

3

Red.

151

Vc. *(mf)*

Pno. *mp*

153

Vc. *f*

Pno. *p* *f* *mf*

gliss strum with fingernail apply written density

scratching sounds with fingernails

Ped. *mp*

Detailed description: This system covers measures 153 and 154. The Violin (Vc.) part begins with a glissando from a lower note to a higher one, followed by a series of notes with slurs. The Piano (Pno.) part features a glissando strum with fingernails, indicated by a dense cluster of notes and a dynamic range from *p* to *f*. Below this, there are 'scratching sounds with fingernails' represented by a wavy line. The right hand of the piano plays a series of notes with slurs, and the left hand has a few notes. The Pedal (Ped.) part has a sustained note with a dynamic of *mp*.

155

Vc. *mf*

Pno. *p* *f*

gliss

tap with palm of right hand

scratching sounds with fingernails

Ped. *mp*

Detailed description: This system covers measures 155 and 156. The Violin (Vc.) part starts with a glissando, followed by notes with a dynamic of *mf*. The Piano (Pno.) part features 'tap with palm of right hand' on the strings, indicated by a series of notes with a dynamic range from *p* to *f*. Below this, there are 'scratching sounds with fingernails' represented by a wavy line. The right hand of the piano plays notes with slurs, and the left hand has a few notes. The Pedal (Ped.) part has a sustained note with a dynamic of *mp*.

157

Vc.

Pno.

3

3

Detailed description: This system covers measures 157 and 158. The Violin (Vc.) part has a single note with a dynamic of *p*. The Piano (Pno.) part features triplets of notes in both hands, with slurs over them. The Pedal (Ped.) part has a sustained note.

159

Vc. *f*

Pno. *p* *f* *mf*

gliss

scratching sounds with fingernails

Ped.

Detailed description: This system covers measures 159 and 160. The Violin (Vc.) part starts with a glissando, followed by notes with a dynamic of *f*. The Piano (Pno.) part features 'scratching sounds with fingernails' represented by a wavy line, with a dynamic range from *p* to *f*. The right hand of the piano plays notes with slurs, and the left hand has a few notes. The Pedal (Ped.) part has a sustained note.

161

Vc.

Pno.

mp scratching sounds with fingernails

Red.

H

163

Vc.

Pno.

mp

f

f

165

Vc.

Pno.

mp

gliss

167

Vc.

Pno.

gliss

169

Vc.

Pno.

171

Vc.

Pno.

173

Vc.

Pno.

175

Vc.

Pno.

177

Vc.

Pno.

mp

mf

179

Vc.

Pno.

(white note cluster)

p

181

Vc.

Pno.

gliss

f

mf

p — *f* — *mp*

183

Vc.

Pno.

185

Vc.

Pno.

3

3

p

187

Vc.

Pno.

tr

mp ————— *f*

mf

3

tr

189

Vc.

Pno.

gliss

f

mf

3

3

8^{vb}-----|

191

Vc.

Pno.

mf

3

3

mp

8^{vb}-----|

Vc. *gliss*

Pno.

(8).....

Vc. *gliss*

Pno.

(8).....

Vc. *gliss*

Pno.

tr

Vc. *gliss*

Pno.

(tr)

200

Vc.

Pno.

pedal softly

mf

Ped.

201

Vc.

Pno.

ff

mf

fff

Black Onyx

The Human Brain on Music and Sound

Movement II

Instrumentation:

Flute

ViolonCello

Grand Piano

Approximate duration 12 min 30 sec

Black Onyx

The Human Brain on Music and Sound

Approximate duratio: 12 min 30 sec

Aryan B.

Movement II:

A $\text{♩} = 72$
intenso sempre

Flute

Violoncello

Piano

Detailed description: This block contains the first four measures of the score. The Flute part (treble clef, 5/4 time) has a dynamic marking of *mp* and a tempo marking of $\text{♩} = 72$. It plays a sustained note with a breath mark. The Violoncello part (bass clef, 5/4 time) has a dynamic marking of *mp* and plays a sustained note with a breath mark. The Piano part (grand staff, 5/4 time) is silent, indicated by a whole rest in both staves. Dynamic markings *mf* are shown with hairpins at the end of the measures.

3

Fl.

Vc.

mp

mf

molto sul pont senza vib

gliss

Detailed description: This block contains measures 3 and 4. The Flute part (treble clef, 5/4 time) has a dynamic marking of *mp* and plays a sustained note with a breath mark. The Violoncello part (bass clef, 5/4 time) has a dynamic marking of *mp* and plays a sustained note with a breath mark. Performance instructions for the Cello include "molto sul pont senza vib" and "gliss". Dynamic markings *mf* are shown with hairpins at the end of the measures.

5

Fl.

Vc.

gradually towards molto vib and normale

gliss

normale molto vib

mp

Detailed description: This block contains measures 5 and 6. The Flute part (treble clef, 5/4 time) has a dynamic marking of *mp* and plays a sustained note with a breath mark. The Violoncello part (bass clef, 5/4 time) has a dynamic marking of *mp* and plays a sustained note with a breath mark. Performance instructions for the Cello include "gliss" and "normale molto vib".

7

Fl.

Vc.

(molto vib)

senza vib sul D

gliss

p

Detailed description: This block contains measures 7 and 8. The Flute part (treble clef, 5/4 time) has a dynamic marking of *p* and plays a sustained note with a breath mark. The Violoncello part (bass clef, 5/4 time) has a dynamic marking of *p* and plays a sustained note with a breath mark. Performance instructions for the Cello include "(molto vib)", "senza vib sul D", and "gliss".

9

Fl. *fl.*

Vc. *sffz* *mf* *sul D*

11

Vc. *sffz*

Pno. *mp* *Ped.*

tap the exposed strings with palm of hand

13

Fl. *poco vib* *mp*

Vc. *mp* *sul D gradually towards molto vib* *molto vib*

Pno. *Ped.*

15

Fl.

Vc. *sffz* *mp* *sul C + G (con vib on D)*

Pno. *Ped.*

4 17

Fl. *secco* *fl.*
(mp) *sfffz* *mf* *f*

Vc. *(mp)*

Pno. *mp*
Ped.

19

Fl. *molto vib* *gliss pitch bend senza vib*
mp

Vc.

Pno.

21

Fl. *secco* *fl.*
sfffz *mf* *f* *ff*

Vc. *sul pont senza vib*
mf

Pno. *Ped.*

23

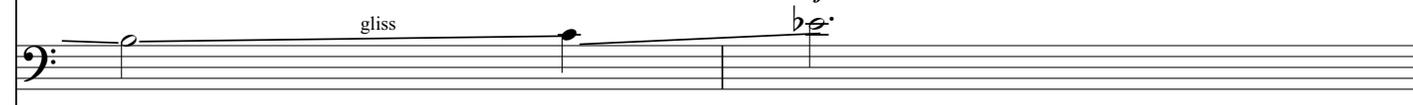
Fl. *mf* *ff* *f* *molto vib*

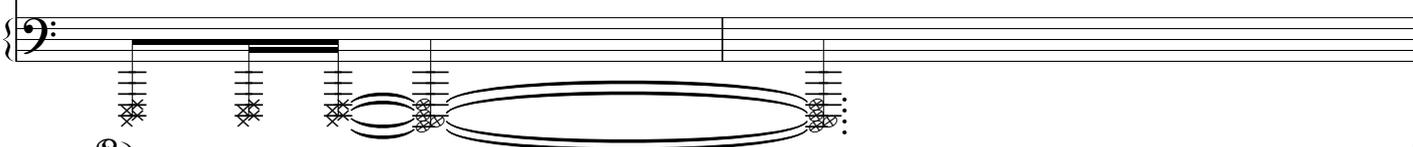
Vc. *sul D normale* *gliss* *gliss*

Pno. *Ped.*

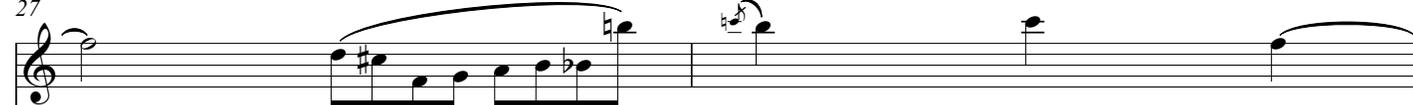
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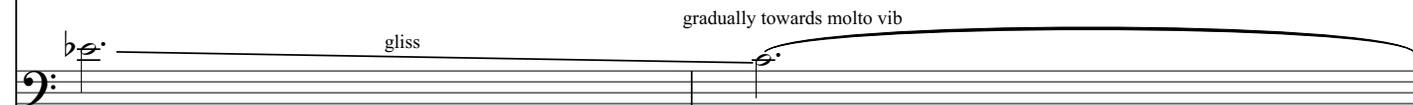
Fl. 

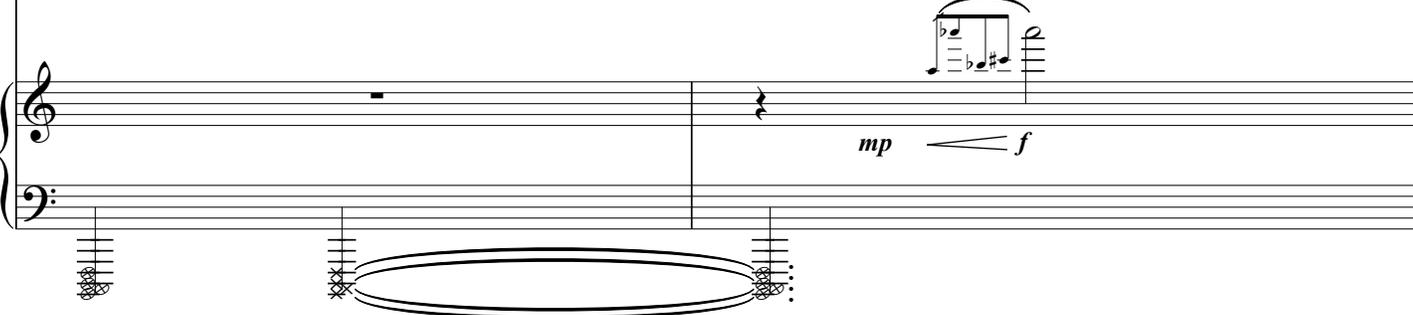
Vc.  gliss *mf*

Pno.  *Ped.*

27

Fl. 

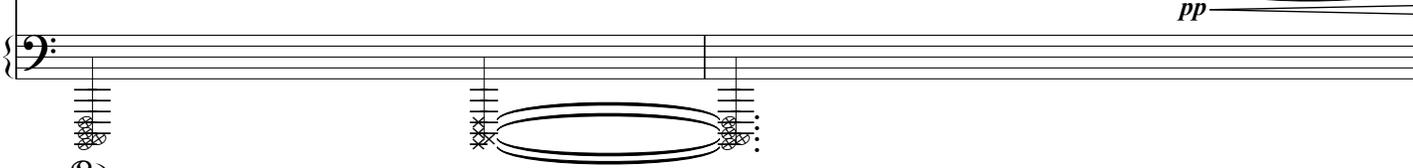
Vc.  gliss gradually towards molto vib

Pno.  *mp* \triangle *f* *Ped.*

29

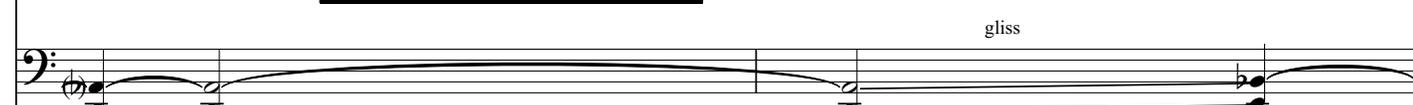
Fl. 

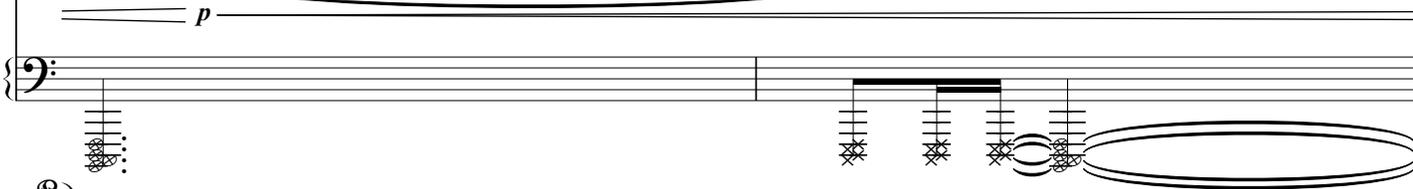
Vc.  *molto vib* *mf* \triangle *f* senza vib sul pont (sul C+G all the way to measure 39 without changing the interval shape) *pp*

Pno.  *Ped.*

31

Fl. 

Vc.  *p* gliss

Pno.  *Ped.*

6 33

Fl. *ff* towards normale normale *f* gliss

Vc.

Pno. *mp* < *f* *mp*

35

Fl.

Vc. gliss *f*

Pno. *Red.*

37

Fl.

Vc. gliss gliss pitch bend

Pno.

39

Fl.

Vc. sul D + A gliss

Pno. *mp* < *f* *mf*

Red. (mp)

41 *molto vib* 7

Fl. *mp* *fff* *sffz* *mp*

Vc.

Pno.

Red.

43 **B** *secco martele/marcato* *f*

Fl. *f*

Vc. *f*

Pno. *f*

Red.

45 *fl.* *mp* *ff* *5*

Fl. *mp* *ff*

Vc. *mp* *ff*

Pno. *mp* *ff*

8

47 *fl.*

Fl.

Vc.

Pno.

mp \triangle *f*

Ped. *mf*

49 *fl.*

Fl.

Vc.

Pno.

mp \triangle *ff* *f* $\#$ *8^{vb}*

Ped.

51 *fl.*

Fl.

Vc.

Pno.

mp

Ped.

53 *fl.* *molto vib*

Fl.

Vc.

Pno. *f* 7

Ped. *f*

55

Fl. 3 3

Vc.

Pno. *f* 7 *mp* *ff* *mf* 5

Ped. *f*

57 *molto vib* 5

Fl.

Vc.

Pno. *f* *ff*

Ped.

10 59 *fl.* *b* *j.w.*
Fl. *sffz* *mf*
Vc.
Pno. *f* *ff* *mp*
Ped.

61 *b* *j.w.*
Fl. *f* *sffz* *mf*
Vc.
Pno. *ff* *secco senza ped angriily* *f*
Ped.

63 *b*
Fl. *ff*
Vc.
Pno. *5* *5* *5* *5* *5* *5*

65 *fl.*

Fl.

Vc.

Pno.

67

Fl.

Vc.

Pno.

69 *j.w.* *fl.* *secco* *fl.*

Fl.

Vc.

Pno.

sfz *mf* *ff* *mf*

71

Fl. *ff*

Vc.

Pno.

73

Fl.

Vc.

Pno.

75

Fl. *molto vib*

Vc.

Pno.

76 *secco* *fl.* *fff* 13

Fl.

Vc.

Pno. *fff* *Ped.* *fff*

78 **C** *senza vib*

Fl. *p* *mf* *p* *mf*

Pno. **C** *8^{va}* *fff* *Ped.* *mf*

80 *molto misterioso*

Fl. *ff* *f*

Pno.

82

Fl. *mp* *f* *mf*

Pno. *Ped.* *(mf)*

84

Fl. *senza vib* towards *con vib*

f *mp*

86

Fl. *con vib* *poco vib* *espressivo*

mf *f* *mf* *f*

3

88

Fl.

90

Fl.

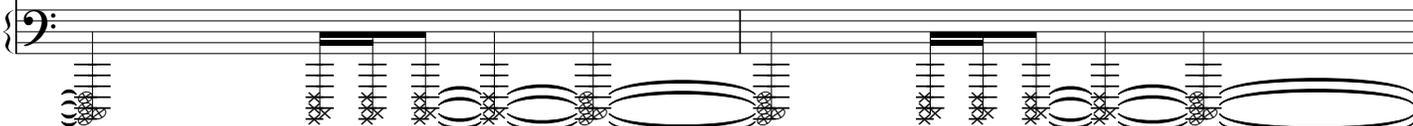
5

92

Fl. *molto vib*

94

Fl. 

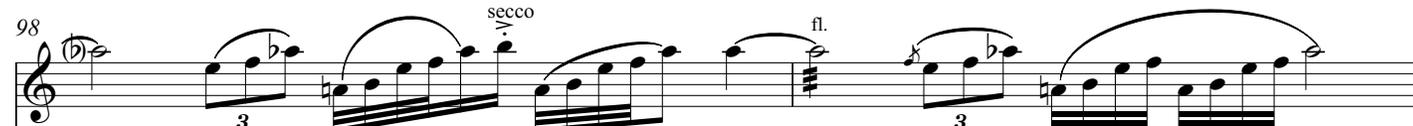
Pno. 

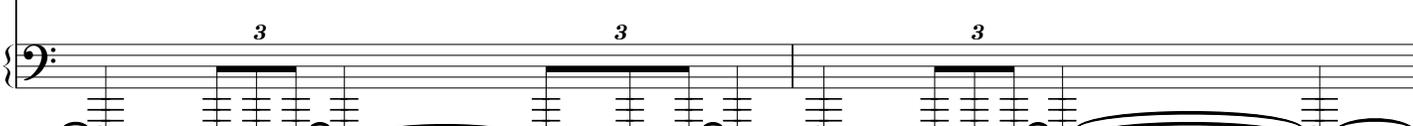
96

Fl. 

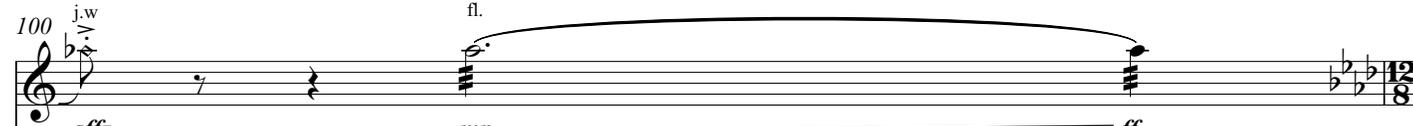
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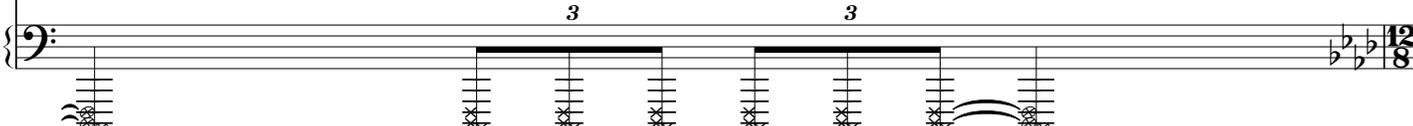
98

Fl. 

Pno. 

100

Fl. 

Pno. 

16

101 **D** $\text{♩} = 120$ senza vib under one full breath if possible pitch bend gliss

Fl. *mp* *f* *mp*

Pno. $\text{♩} = 120$ **D** molto espressivo *mf* Ped.

102 gliss pitch bend

Fl. *p*

Pno. *f* *mf*

104

Pno.

106

Pno.

108

Pno.

110 *tr* *mp* *ff* *mf* *tr* *ff* *mf* *8va*

112 *8va* *tr* *mp* *ff*

114 *Fl.* *mp* *molto espressivo* *tr* *f* *mf*

116 *Fl.* *f* *fl.*

118

Fl. *ff* *fl.* *secco* *fl.*

Pno. *ff*

120

Fl. *mp* *f* *mf* *tr*

Pno. *mf* *mp* *ff* *f*

122

Fl. *f* *mp* *ff*

Vc. *mf* *espressivo*

Pno. *f* *mp* *fff*

124 **E**

Vc. *f* gliss *ff*

Pno. *f* pedal similarly

126

Vc. gliss

Pno.

128 *con amore*

Fl. *mf* *ff*

Vc.

Pno. *rit.*

130

Fl. *f* *fl.*

Vc. *gliss* *f*

Pno. *mf* *ff* *f*

(8)

132

Fl. *molto vib* *fl.* *ff* *fl.*

Vc. *gliss* *fff*

Pno. *tr* *tr*

(8)

134

Fl. *fl.* *molto dolente* *fff*

Vc. *gliss* *ff* *gliss*

Pno. *tr*

136

Fl. *ff*

Vc.

Pno. *mf* *ff*

tr

138

Fl. *sffz* *f* *fff*

Vc. *senza vib* *fff*

Pno. *f* *fff* *8^{va}*

j.w *fl. senza vib under one full breath*

F

140

Fl. *mf*

Vc. *mf*

Pno.

F

141

Fl. *p*

Vc. *p*

Pno. *f* 8^{vb}

♩=60

143

Fl.

Vc. *(p)* molto sul pont senza vib gliss

Pno. *mp*

Red.

145

Fl. *senza vib*

Vc. *mp* *p* *normale*

Pno.

147

Fl.

Vc.

Pno.

149

Fl. *molto vib*

Vc. *mp*

Pno. *mp* *f*

24 151

Fl. *mf* *sffz* *mf*

Vc. *mf* 3

Pno. *mp* 7 *ff* *mp* *ff*

Ped. *f* *ff* 8^{vb}

j.w. *fl.* *tr*

153

Fl. *ff*

Vc. *f* *secco molto martele*

Pno. *mf*

G  molto agitato con vib

155

Fl. *fff*

Vc. *gliss* *sffz*

Pno. *mf* 7 *ff* *f* 5 *fff*

Ped. *f*

tr

157

Fl.

Vc. *gliss*

Pno. *ff*

f

Ped.

159

Fl.

Vc. *molto vib*

Pno.

molto furioso sempre (breaths should be taken under the rests as much as possible for legato)

160

Fl.

Vc.

Pno. *mp* *7* *ff* *mp*

f

Ped.

26 161

Fl. *7*

Vc. *molto martele secco*
ff

Pno. *ff* *mf* *7*

162

Fl. *tr*
mp *ff* *ff* *molto vib*

Vc. *gliss* *fff*

Pno. *mf*

Ped. *mp*

163

Fl. *pizz*
sffz *ff*

Vc. *7*

Pno. *p* *fff* *f*

164 27

Fl.

Vc.

Pno.

165

Fl.

Vc.

Pno.

166

Fl.

Vc.

Pno.

28 167 *secco*

Fl. *secco*

Vc. *gliss*

Pno. *mp* *fff* *mf* *mp*

169

Fl.

Vc.

Pno.

170

Fl.

Vc. *gliss*

Pno. *ff* *mf*

171 **H**

Fl. *secco*

Vc. *gliss*

Pno. *p* *fff*

172

Fl.

Vc. *molto dolente* *(fff)*

Pno. *mf* *7* *ff* *f* *ff*

t.h.

173

Fl.

Vc. *(secco) molto martele*

Pno. *f* *ff* *mp*

30

175

Fl.

Vc.

Pno.

f

gliss

176

Fl.

Vc.

Pno.

p

fff

mp

senza vib under one full breath

177

Fl.

Vc.

Pno.

fffz

fff

pedal ad lib

fff

178

Fl.

Pno.

ff

f

180

Fl.

Pno.

sfffz

f

secco

fl. con fuoco

182

Fl.

Pno.

ff

p

I

senza vib

I

(ff)

(f)

184

Fl.

Pno.

sfffz

mf

ff

mf

mp

secco

fl.

gliss pitch bend senza vib

tr

32

186

Fl.

f

mf

f

Pno.

188

Fl.

molto lacrimoso

Pno.

190

Fl.

3

Pno.

192

Fl.

Pno.

tr

b

194

Fl. *mp* 3

Pno. (tr)

196

Fl. *p* 3

Pno.

198

Fl.

Pno.