

IANNIS XENAKIS

ST/4-1,080262

*Quatuor à cordes · String Quartet
Streichquartett*

*Partition · Score
Partitur*

12.572



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L'oeuvre fut créée à Paris en 1962 par le Quatuor Bernede.
Signification du titre: (qui est dans son intégralité: ST/4-1,080262) ST=(Musique) Stochastique. Stochastique signifie en mathématiques, aléatoire, au hasard, soumis aux probabilités, et a été introduit par Jacques Bernoulli; 4-1=première oeuvre pour quatre instruments, 080262 =le 8 Février 1962, date où cette oeuvre fut calculée par le cerveau électronique. ST/4 est une -version pour 4 cordes de l'oeuvre ST/10 pour dix instruments qui a été calculée par le cerveau électronique 7090 IBM à Paris suivant un "programme" stochastique (=probabiliste), spécial, imaginé par Xenakis. Ce "programme" est un dérivé de la thèse du "Minimum de Règles de Composition", qui avait déjà été formulée dans *Achorripsis* pour 21 instruments mais de n'est que quatre ans plus tard qu'elle a pu être "mécanisée" chez IBM France. Le "programme" est un complexe de lois stochastiques (=du calcul des probabilités) que l'auteur a introduites en composition musicale depuis de nombreuses années. Il commande au cerveau électronique de définir tous les sons d'une séquence calculée préalablement, l'un après l'autre. D'abord sa date d'occurrence ensuite sa classe de timbre (arco, pizzicato, glissando, etc...) son instrument, sa hauteur, la pente du glissando s'il y a lieu, la durée et la forme dynamique de l'émission du son. Ce quatuor utilise toutes les façons de jouer des instruments à cordes, notamment celles inaugurées par Xenakis dans ses œuvres pour orchestre *Metastaseis* (1954) et *Pithoprakta* (1955), tels que la percussion sur les caisses des instruments, les glissandi systématiques avec l'archet, en pizzicati et en frappés avec le bois de l'archet.

Pour plus d'information, lire "A la recherche d'une Musique stochastique", article de Xenakis, dans la revue Gravesaner Blätter n° 11/12, 1958, ainsi que les chapitres I et V du livre "Musiques formelles" également de Xenakis, édition Richard-Masse, 7 place St-Sulpice, Paris VI, 1963. Pour le programme en langage Fortran voir Gravesaner Blätter n° 26, édit. Hermann Scherchen, Gravesano, Tessin, Suisse.

First Performance: Paris, 1962, by the Bernede String Quartet.

Explanation of the title as shown by its components: ST/4-1,080262: ST= stochastic music. Stochastic in mathematics means aleatory, by chance, subject to probabilities, and was introduced by Jacques Bernoulli. 4-1=first work for 4 instruments. 080262=8th February 1962, the date when this work was calculated by the electronic brain.

ST/4 is a version for four strings of the work ST/10 for 10 instruments, which was calculated by the electronic brain 7090 IBM in Paris in obedience to a special stochastic (probabilist) "programme" devised by Xenakis. This "programme" was derived from the thesis of "Minimum of Rules of Composition," which had already been formulated in *Achorripsis*, but it was not until four years later that it became possible to have it "mechanised" at IBM-France. The "programme" is a complex of stochastic laws which the composer had been introducing into musical composition for a number of years. He orders the electronic brain to define all the sounds of a sequence, previously calculated, one after the other. First, the time of its occurrence, next its kind of timbre (arco, pizzicato, glissando, etc.), its instrument, its pitch, the gradient of its glissando where that occurs, the duration and dynamic of the emission of sound. This Quartet makes use of every way of playing these stringed instruments, notably those introduced by Xenakis in his orchestral works *Metastasis* (1954) and *Pithoprakta* (1955), such as tapping the backs of the instruments, glissandi, pizzicato and *col legno* taps on the strings.

For further information, see "In search of a stochastic music", Xenakis's article in the review Gravesaner Blätter Nos. 11/12 of 1958, also chapters I and V of the book "Musiques formelles", also by Xenakis, published by Richard-Masse, 7 place St-Sulpice, Paris VI, 1963. For the programme in Fortran code see Gravesaner Blätter No. 26, published by Hermann Scherchen, Gravesano, Tessin, Switzerland.

Das Werk wurde im Jahre 1962 in Paris vom Streichquartett Bernede uraufgeführt.

Titelerläuterung (vollständig: ST/4-1,080262): ST=stochastische Musik. Stochastisch bedeutet in der Mathematik „ungewiss“, „zufällig“, „der Wahrscheinlichkeit unterworfen“ und ist von Jacques Bernoulli eingeführt worden; 4-1=erstes Werk für 4 Instrumente. 080262=8. Februar 1962, der Tag, an dem das Werk vom Elektronengehirn errechnet wurde.

ST/4 ist eine Version für 4 Streichinstrumente des Werkes ST/10 für 10 Instrumente, das vom Elektronengehirn 7090 der IBM in Paris nach einem vom Komponisten erdachten besonderen stochastischen (Wahrscheinlichkeits-) "Programm" errechnet wurde. Dieses "Programm" ist aus dem Grundsatz vom „Mindestmaß von Kompositionssregeln“ hergeleitet, der schon in *Achorripsis* für 21 Instrumente formuliert worden war, aber erst vier Jahre später von IBM-France „mechanisiert“ werden konnte. Das Programm ist ein Komplex von stochastischen Gesetzen (Wahrscheinlichkeitsrechnung), die der Komponist seit vielen Jahren in die musikalische Komposition eingeführt hat. Es gibt dem elektronischen Gehirn auf, alle Töne einer vorher errechneten Sequenz, einen nach dem anderen, zu definieren. Zuerst den Zeitpunkt des Eintritts, sodann die Klangfarbe (arco, pizzicato, glissando etc.), sein Instrument, seine Lage, die Steilheit des Glissandos soweit erforderlich, die Dauer und Dynamik. Dieses Streichquartett verwendet die Instrumente in jeder nur möglichen Weise, so wie es Xenakis bereits in seinen Orchesterwerken *Metastaseis* (1954) und *Pithoprakta* (1955) gezeigt hat, z.B. das Klopfen auf den Körper der Instrumente, die systematischen Glissandi mit dem Geigenbogen, die Pizzicati und das Schlagen mit dem Rücken des Bogens. Weitere Information ist in Xenakis' Artikel „Auf der Suche nach einer stochastischen Musik“ in den „Gravesaner Blättern“, No. 11/12, 1958, Verlag Hermann Scherchen, Gravesano, Tessin, Schweiz, enthalten, ebenso wie in den Kapiteln I und V des Buches „Musiques formelles“, gleichfalls von Xenakis, im Verlag von Richard-Masse, 7 place St. Sulpice, Paris VI, 1963. Das Programm in Fortran-Sprache siehe Gravesaner Blätter No. 26.

Durée d'exécution · Duration · Spieldauer

ca. 12 min.

$d = 60 \text{ MM en moyenne}$

IANNIS XENAKIS

(1922-)

J.W.1

1^{er} V on

2^d V on

Alto

V IIc

4

legno
arco
sul pont.
Pizz.
arco
spicc.
norm.
sempre pp
s.p.

Pizz.
table
legno
Pizz.
arco
ff
sul pont. gva

Table
legno
Pizz.
arco
sul pont.
Pizz.
arco
legno

10

Pizz.

8va circos. pont.

legno table

pizz legno

arco

JW = 3

legno

table legno

arco sul pont.

legno Pizz.

arco

f > f > p

f > pp

Pizz.

14

(f)

legno arco

pizz. arco

arco

pizz. arco

arco sul pont.

legno

table

arco

Pizz.

arco

JW = 2

19

Table

legno

arco

pizz.

sul pont.

subp.

sempre f

5

ff sub.f

arco

5

ff

5

ff sul pont.

JW = 2

23

Handwritten musical score for page 23. The score consists of three staves. The top staff has a treble clef and a bass clef below it. The middle staff has a bass clef. The bottom staff has a bass clef. Various dynamics and performance instructions are written above the staff, including "arco s. pont.", "f", "p", "ppp", "5 arco sul pont.", and "arco". Measures are indicated by vertical bar lines.

23

Handwritten musical score for page 23, continuing from the previous page. The score consists of three staves. The top staff has a treble clef and a bass clef below it. The middle staff has a bass clef. The bottom staff has a bass clef. Dynamics and performance instructions include "legno", "frappé", "legno", "pizz.", "6:4", "ppp", "p", "f", "mf", "p", "ff", "5 arco s. pont.", and "5 arco pont.". Measures are indicated by vertical bar lines.

35

Handwritten musical score for page 35. The score consists of a single staff with a bass clef. Dynamics and performance instructions include "5 arco", "p", "ff", "f", and "5 Pizz.". Measures are indicated by vertical bar lines.

Handwritten musical score page 41. The score consists of four staves. The top staff uses a treble clef, the second staff a bass clef, the third staff a C-clef, and the bottom staff a bass clef. Measure 1 starts with a dynamic of *ff*, followed by *pizz.*. Measure 2 starts with *f*. Measure 3 starts with *pp*, followed by *ff*, and includes a triplet marking over two measures. Measure 4 starts with *p*, followed by *pizz.*, and includes a dynamic of *ff*.

Handwritten musical score for string quartet (Violin 1, Violin 2, Cello, Bass) on five staves. The score includes dynamic markings such as *pizz.*, *p*, *ppp*, *ff*, *f*, *fff*, *fff*, *pos. norm.*, and *arco*. Measure 1: Violin 1: *pizz.*, *f*; Violin 2: *pizz.*, *fff*; Cello: *pizz.*, *fff*; Bass: *pizz.*, *fff*. Measure 2: Violin 1: *pizz.*, *p*; Violin 2: *pizz.*, *p*; Cello: *pizz.*, *p*; Bass: *pizz.*, *p*. Measure 3: Violin 1: *ppp* (with *3* above), *ff*; Violin 2: *ppp* (with *5* above), *ff*; Cello: *ppp* (with *5* above), *ff*; Bass: *ppp* (with *5* above), *ff*. Measure 4: Violin 1: *ppp* (with *3* above), *ff*; Violin 2: *ppp* (with *5* above), *ff*; Cello: *ppp* (with *3* above), *ff*; Bass: *ppp* (with *5* above), *ff*. Measure 5: Violin 1: *ppp* (with *3* above), *ff*; Violin 2: *ppp* (with *5* above), *ff*; Cello: *ppp* (with *3* above), *ff*; Bass: *ppp* (with *5* above), *ff*.

61

Handwritten musical score for string quartet. The score consists of four staves. The first three staves are in treble clef, and the fourth staff is in bass clef. The music includes dynamic markings such as *ff*, *f*, *p*, *pp*, and *fff*. Performance instructions include *arco*, *legno*, *Pizz.*, and *Table*. Measure 61 ends with a repeat sign and a section labeled *J.W=5*.

70

Handwritten musical score for string quartet. The score consists of four staves. The first three staves are in treble clef, and the fourth staff is in bass clef. The music includes dynamic markings such as *f*, *p*, *pp*, *fff*, *ppp*, and *sempre ppp*. Performance instructions include *table*, *arco*, *sul pont.*, *Pizz. onglo*, and *legno*. Measure 70 ends with a repeat sign and a section labeled *J.W=5*.

73

Handwritten musical score for string quartet. The score consists of four staves. The first three staves are in treble clef, and the fourth staff is in bass clef. The music includes dynamic markings such as *f*, *mf*, and *sempre ppp*. Performance instruction *legno* is present in the first staff. Measure 73 ends with a repeat sign.

106

Handwritten musical score for string quartet. The score consists of four staves. Measure 106 starts with a dynamic of *sempre p*. It includes various performance instructions such as *Pizz.*, *arco*, *legno*, *table*, and specific bowing techniques like *sul pont.* and *arco sul pont.*. The music is written in common time with a key signature of one sharp.

112

Handwritten musical score for string quartet. The score consists of four staves. Measure 112 features complex rhythmic patterns and dynamics including *ff*, *p*, *f*, and *pp*. Performance instructions include *sul pont.*, *arco*, *legno*, *table*, and *arco sul pont.*. The music is in common time with a key signature of one sharp.

118

Handwritten musical score for string quartet. The score consists of four staves. Measure 118 shows a variety of dynamics and performance techniques. Instructions include *sul pont.*, *arco sul pont.*, *table*, *semperf*, *arco*, *legno pizz.*, *mettez sourdine*, and *pizz.*. The music is in common time with a key signature of one sharp.

This image shows a page from a handwritten musical score for orchestra, page 139. The score consists of six staves, each with a different instrument's part. The instruments include strings (two staves), woodwind (one staff), and brass (three staves). The music is written in common time. Various dynamics are indicated throughout the score, such as *p*, *f*, *pp*, *fff*, *pizz.*, *legno*, *arco*, and *sul pont.*. The score is highly detailed, with many specific performance instructions and markings.

143

arcos
sul pont.

legno arco
sul pont.

ppp f ppp f

arco sul pont. Pizz.

legno Pizz.

ff pp

Pizz. table legno Pizz.

3 legno

ff p

arco

ff pp f Pizz. arco

ff p Pizz. arco sul pont.

- 10 -

151

Pizz.

table

pizz

arco *sul pont.*

p

ava 16

p

f

8va

p *f* *pp*

8va 16

arco

ff *pp* *ff*

p

sul pont. *legno* *sul pont.*

p *f* *ff*

arco

p *ff* *p*

legno *Pizz.*

pp *f* *ff*

pp *ff* *p*

arco

pp *ff* *p*

5

sempr pp

ff *f* *ff* *pp*

ff *f* *ff* *pp*

164

168

172

176 -12-

Arco legno arco legno Table

Arco sul pont. 3 Pizz. 5 Arco (ff) 3 legno Table

legno, Pizz. arco sul pont. 3 Pizz. legno arco sul pont.

180

Handwritten musical score page 180 featuring two staves of music. The top staff uses a treble clef and the bottom staff uses a bass clef. Various dynamics are indicated, including *p*, *ff*, *pp*, *sf*, *mf*, *arco*, *pizz.*, *legno*, and *Table*. Performance instructions like 'sul pont.' and '3' are also present. The score is divided into measures by vertical bar lines.

195

legno

arco

sul pont.

Pizz.

arco

legno Pizz.

legno

arco

sul pont.

Pizz.

sempre

arco

Pizz.

legno

arco

sul pont.

legno arco

Pizz.

Handwritten musical score for string quartet, page 221, measures 1-10. The score consists of four staves: Violin 1 (top), Violin 2, Cello, and Double Bass (bottom). The key signature is A major (no sharps or flats). Measure 1: Violin 1 starts with a dynamic of *p*, followed by *pp*, *ff*, and *f*. Measure 2: Violin 1 has a dynamic of *ppp*, followed by *f*, *pp*, *ff*, *mp*, and *p*. Measure 3: Violin 1 has a dynamic of *ppp*, followed by *ff*, *ff*, *ff*, *ff*, *legno*, and *p*. Measure 4: Violin 1 has a dynamic of *Pizz.*, *arco*, *bip*, *#P*, *f*, and *p*. Measure 5: Violin 1 has a dynamic of *p*. Measure 6: Violin 1 has a dynamic of *Pizz.*, *molto vibrato*, *f*, *ppp*, *ff*, *f*, *ff*, and *mf*. Measure 7: Violin 1 has a dynamic of *ff*, *ff*, *p*, *f*, *f*, and *ff*. Measure 8: Violin 1 has a dynamic of *ff*, *f*, *ff*, *ff*, *ff*, and *mf*. Measure 9: Violin 1 has a dynamic of *Pizz.*, *arco*, *onglo*, *#P*, *f*, and *p*. Measure 10: Violin 1 has a dynamic of *f*, *mf*, *pp*, *pp*, *p*, *b>*, *p*, *b>*, *p*, *b>*, *f*, *pp*, and *p*.

226

Pizz.
ongle $\text{b} \ddot{\text{o}}$

Pizz.

$\overbrace{\quad \quad \quad}^3$ Pizz.

sul pont.

p ff f p

ff'

f

sempr. mf

Pizz. arco

ff $\text{ff} \text{ pp sub.}$

mp



- 16 -

legno
232

legno
ff
pp
Pizz.
f
fff
p
baissez la corde d'Ut sur Sol
Pizz.
mp
sempre mp

239

legno
pp
arco
f
Pizz. arco
f
pp
refaire l'accord
sempre pp
Pizz.
en tournant la cheville à chaque note
8va b8

246

sans vibrato
ff
p
f
legno
arco sans vibr.
refaire l'accord
ff
f=p=ff
8va b8

Table

- 7 -

253

260

A handwritten musical score for string quartet. The score consists of four staves: Violin I (top), Violin II, Cello, and Double Bass (bottom). The key signature is B-flat major (two flats). The time signature varies between common time and 5/8. Dynamics include *p*, *pp*, *f*, *fff*, *sfp*, *sffz*, and *Pizz. onglo*. Articulations include accents, slurs, and grace notes. Measure numbers 1 through 10 are indicated above the staves.

268

Pizz.

2

ff

Pizz.

2

ff

2

2

2

9:

fff

sempre

ppp

arco

pp sempre

3

5

legno

arco

p

pp

5

sul pont.

ppp

278 J.W.13 - 18 -

283 J.W.14

288

sempre ff

Handwritten musical score for string quartet (Violin 1, Violin 2, Viola, Cello) on three staves. The score includes dynamic markings like *p*, *f*, *ff*, *pp*, *legno*, *arco*, *Tegno*, *Pizz.*, and *spicc.*. It also features performance instructions such as *(sol)*, *3*, and *5* (indicated by a bracket over five notes). Measure 1 starts with *Pizz.* and *#*. Measure 2 begins with *legno* and *pizz.* Measure 3 starts with *arco*.

Handwritten musical score for orchestra, page 301, measures 1-10. The score includes ten staves of music with various dynamics, articulations, and performance instructions such as Pizz., spicc., arco, legno, ff, f, p, pp, and sforzando.

- 20 -

304

307

310

322

3 Pizz. ongle arco legno - 22 - spicc. sul pont. legno

arco sul pont. 5 Pizz. 5 arco

pp ff pp f = p = f 5 Pizz. 5 arco

legno mp ff 5 sul pont. f = p ff = p = f 5 Pizz.

f *p* *f* = *p* *f* *p* *f*

328

5

sempre ff

*arco
sul pont.*

Pizz.

pp > f p pp

sempre p

f p

f = p

Pizz. legno

(Pizz.)

3 arco

ff = p

ff arco

ff-p-ff

Handwritten musical score for orchestra, page 334, measures 1-3. The score includes three staves of music with various dynamics, articulations, and performance instructions such as 'arco', 'pizz.', 'legno', 'table', and 'pont.'. Measure 1 starts with a dynamic of fff followed by ppp . Measure 2 begins with f , followed by ff and p . Measure 3 starts with p , followed by f and ff .

6 battements aller à 3 batt. aller à ... 10 battements aller à 2 battements les maintenir
(battements entre fa# et sol, le fa# IV côte de se rapprochant ou s'éloignant du sol.)
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340

340

3
sul pont. $\text{f} \text{-->} \text{p}$

Pizz. legno 3
 $\text{ff} \text{-->} \text{p}$
 $\text{f} = \text{p} < \text{ff}$

legno arco sul pont.
 $\text{f} > \text{p}$
 p

-24- 3 norm
 $\text{p} < \text{ff} > \text{f} \text{-->} \text{p}$
arco sul pont.
 $\text{p} < \text{f} > \text{p}$

sempre p
 $\text{f} = \text{p}$

legno 3
 $\text{f} = \text{p}$

arco
 $\text{p} < \text{f} > \text{p}$
 $\text{f} = \text{p} < \text{f}$

Pizz. arco sul pont.
 $\text{f} = \text{p}$
 $\text{p} < \text{f} > \text{p}$

2 battements aller à 6 batt

2 bailemenos aler a ...

Pizz. — 5 — arco

legno

343

legno

legno

arco

legno

(legno)

Pizz. sul pont.

sempre p

arco

552

Handwritten musical score for string instruments, page 552. The score consists of four staves of music with various performance instructions like "arco", "pizz.", "legno", and dynamic markings like "ff", "pp", "f", "p". The score is written in 2/4 time with a key signature of one sharp.

358 -26-

PizzD = apres le pizz. la corde doit battre sur l'ongle qui l'effleure