

**ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF ARTS AND SOCIAL
SCIENCES**

JOHN CAGE AND HIS USE OF THE I CHING METHOD

Ph.D. THESIS

Deniz KAYA ELİVAR

Department of Music

Music Programme

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İSTANBUL TEKNİK ÜNİVERSİTESİ ★ SOSYAL BİLİMLER ENSTİTÜSÜ

JOHN CAGE VE I CHING METODUNU KULLANIŞI

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To Emre Elivar,

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TABLE OF CONTENTS

	Page
FOREWORD.....	ix
TABLE OF CONTENTS	xi
ABBREVIATIONS	ixv
LIST OF TABLES	xvii
LIST OF FIGURES	ixix
SUMMARY	ixxiii
ÖZET	ixxv
1. INTRODUCTION AND JOHN CAGE’S LIFE	1
1.1 Purpose of Thesis	3
1.2 Literature Review.....	5
1.3 John Cage’s Childhood and Early Life	7
1.4 Early Career	10
1.5 Later Career	14
1.6 Personal Life	16
1.7 Cage’s Health Problems and Death	17
1.8 His Notable Awards and Achievements	17
2. I CHING, THE BOOK OF CHANGES.....	19
2.1 What Is I Ching	16
2.1.1 The origin of the I Ching	19
2.1.1.1 The divination text of the I Ching.....	21
2.1.1.2 Zhou Yi (Changes of Zhou).....	21
2.1.1.3 Yin and Yang	22
2.1.1.4 Fu Hsi.....	24
2.1.1.5 King Wen of Zhou and his son, the Duke of Chou.....	26
2.1.1.6 Confucius (551-479 BC).....	27
2.1.2 The Ten Wings.....	27
2.1.2.1 T’uan Chuan and Hsiang Chuan	29
2.1.2.3 Hsi T’zu Chuan	30
2.1.2.4 Wen Yen	30
2.1.2.5 Shuo Kua, Hsü Kua and Tsa Kua	30
2.1.3 Structure	31
2.1.4 Eight trigrams.....	31
2.1.5 Sixty-four hexagrams.....	32
2.1.6 How to consult I Ching?	33
2.1.7 Development and use	34
2.1.8 Translations of the I Ching	35
2.2 The Usage and Influences of the I Ching in Some Other Disciplines.....	35
2.2.1 Religion and philosophy.....	35

2.2.1.1 Confucianism	36
2.2.1.2 Daoism (Taoism).....	37
2.2.1.3 Buddhism	38
2.2.2 Medicine.....	38
2.2.3 Visual arts.....	42
2.2.4 Architecture.....	47
2.3 The Reasons of Cage's Usage of the I Ching.....	50
2.3.1 No feeling for harmony.....	50
2.3.2 Cage's seeking for innovation and invention.....	51
2.3.3 Cage's new companion Gita Sarabhai and Indian philosophy.....	52
2.3.4 Daisetz Teitaro Suzuki and lectures on Zen Buddhism	53
2.3.5 Meeting with the I Ching	54
2.3.6 Decision on the benefitting from the I Ching and chance operations	56
2.4 Significant Names Interested in the I Ching	59
2.4.1 Merce Cunningham.....	61
2.4.2 Merce Cunningham and his chance operations.....	63
2.4.3 Andrew Culver	64
2.4.4 Andrew Culver and IC (I Ching)	65
2.4.5 Christian Wolff.....	66
2.4.6 Christian Wolff and his use of the I Ching	67
2.4.7 Lou Harrison	68
2.4.7.1 Lou Harrison and the I Ching.....	69
2.4.8 Jackson Mac Low.....	69
2.4.9 Jackson Mac Low and his chance operations	70
3. INDETERMINACY AND PREPARED PIANO	71
3.1 What Is Indeterminacy?	71
3.1.1 John Cage and indeterminacy	72
3.1.2 John Cage's Lectures in Darmstadt (1958).....	74
3.1.2.1 Changes.....	74
3.1.2.2 Indeterminacy.....	75
3.1.2.3 Communication	76
3.1.3 John Cage, Fontana Mix (1958).....	77
3.1.4 John Cage, Cartridge Music (1960)	79
3.2 What is Prepared Piano?	82
3.2.1 The Birth of the Prepared Piano and Bacchanale (1940).....	83
3.2.2 Cage's Dance Works for Prepared Piano.....	85
3.2.3 Sonatas and Interludes	87
3.2.4 Cage's Two Prepared Piano Works	91
4. CAGE'S WORKS COMPOSED WITH THE I CHING AND CHANCE OPERATIONS	93
4.1 Compositions with the I Ching in the Early Fifties	94
4.1.1 Concerto for Prepared Piano (1951) and Music of Changes (1951).....	94
4.1.1.1 Imaginary Landscape No.4 (1951).....	95
4.1.1.2 Two Pastorales (1951).....	96
4.1.1.3 4'33" (1952).....	96
4.1.1.4 Imaginary Landscape No.5 (1952).....	99
4.1.1.5 Music for Carillon No.1 (1952)	100
4.1.1.6 Seven Haiku (1951-52)	101

4.1.1.7 Water Music (1952)	102
4.1.1.8 Williams Mix (1951-53)	104
4.1.1.9 Music for Piano 1-84(1952-56)	105
4.1.2 Compositions with the I Ching in the Late Fifties	107
4.1.2.1 Radio Music (1956)	107
4.1.2.2 Winter Music (1957).....	108
4.1.2.3 Concert for Piano and Orchestra (1957-58).....	109
4.1.2.4 Solo for Voice 1 (1958)	112
4.1.3 Compositions with the I Ching in the Sixties	112
4.1.3.1 Atlas Eclipticalis (1961-62)	112
4.1.3.2 Cheap Imitation (1969)	114
4.1.3.3 HPSCHD (1967-69).....	116
4.1.4 Compositions with the I Ching in the Seventies	117
4.1.4.1 Sixty-two Mesostics Re Merce Cunningham (1971).....	117
4.1.4.2 Cheap Imitation (orchestra version 1972).....	120
4.1.4.3 Etudes Australes I, II and VIII (1974-75).....	121
4.1.4.4 Renga with Apartment House 1776 (1975-76).....	124
4.1.4.5 Freeman Etudes (1977-90).....	128
4.1.4.6 Etudes Boreales for Cello Solo and for Piano Solo I-IV (1978).....	130
4.1.5 Compositions with the I Ching in the Eighties	131
4.1.5.1 Ryoanji: Solos for Oboe, Flute, Contrabass, Voice, Trombon with Percussion or Orchestral Obbligato (1983-85).....	131
4.1.5.2 Etcetera 2 (1985).....	136
4.2 Typical Features of the Works Based on the I Ching and Chance Operations..	137
4.2.1 Works with common features composed by the I Ching and chance operations.....	139
4.2.1.1 Pieces for piano or piano solo and orchestra	139
4.2.1.2 Pieces for Radio and tape.....	140
4.2.1.3 Pieces composed with the star maps.....	140
4.2.1.4 Pieces for voice	141
4.2.1.5 Pieces for any solo	141
4.2.3 Common or uncommon features of the notations.....	142
4.2.4 The general questions asked to the I Ching	145
4.3 The Applied Analyses for detecting these features.....	146
4.4 Music of Changes	147
4.4.1 The Analysis of Music of Changes.....	149
4.4.2 Sound charts.....	149
4.4.2.1 The examples of the sound chart cells corresponding to the I Ching hexagram charts.....	153
4.4.2.2 The examples of the sound chart no.2, cell no.45.....	156
4.4.2.3 The example of the sound chart no.3, cell no.3	158
4.4.2.4 The example of the sound chart no.4, cell no.11	159
4.4.2.5 The example of the sound chart no.5, cell no.19	162
4.4.2.6 The example of the sound chart no.6, cell no.17	164
4.4.3 Mobile and immobile elements.....	167
4.4.4 Dynamic charts (Amplitudes).....	169
4.4.5 Duration charts.....	170
4.4.6 Tempo chart	172

4.4.7 Rhythmic structure of the Music of Changes.....	176
4.4.8 Superpositions (Layers)	179
4.5 Diagnosis and Assessment of the Analysis of the Music of Changes	182
4.5.1 Rhythm, time and tempo	183
4.5.2 Tone, timbre and effects.....	184
4.5.3 Pedals	187
4.5.3.1 Sustain pedal (damper pedal)	188
4.5.3.2 Una corda pedal (soft pedal)	189
4.5.3.3 Sostenuto pedal	190
4.5.4 Sounds and silences.....	190
4.5.5 Non-western tradition and Eastern philosophy in the Music of Changes	191
4.5.6 Interpretations of the Music of Changes	192
4.5.6.1 David Tudor's interpretation.....	192
4.5.6.2 Joseph Kubera's interpretation.....	193
4.5.6.3 Martine Joste's interpretation.....	193
4.5.6.4 Steffen Schleiermacher	194
4.5.6.5 Herbert Henck	194
4.5.6.6 Personal opinions on these interpretations.....	195
5. CONCLUSION.....	197
REFERENCES.....	205
APPENDICES.....	227
CURRICULUM VITAE.....	253

ABBREVIATIONS

UCLA	: University of California, Los Angeles
L. A.	: Los Angeles
UDK	: Berlin University of Arts
CBS	: Colombia Broadcasting System
ASCAP	: The American Society of Composers, Authors and Publishers
ABC	: American Broadcasting Company
D. C.	: District of Columbia
TCM	: Traditional Chinese Medicine

LIST OF TABLES

	<u>Page</u>
Table 2.1 : Charts of Ten Wings	29
Table 2.2 : List of Trigrams and their association with parts of body and organs....	40
Table 3.1 : The order of the Sonatas and Interludes	89
Table 4.1 : Cage's works composed by I Ching and chance operations	93
Table 4.2 : Cage's color charts for Etudes Australes	124
Table 4.3 : Chart mobility at the outset of the Music of Changes	168
Table 4.4 : Parametric chart device of the Music of Changes.....	169
Table 4.5 : Dynamic chart no.8	170
Table 4.6 : Superposition chart structure in the Music of Changes	179
Table A.1 : John Cage's complete work list	229
Table A.2 : John Cage's computer programs by Andrew Culver	244
Table A.3 : Richard Wilhelm's list of eight symbol	247
Table A.4 : The Chinese names and Richard Wilhelm's translations of the sixty-four hexagrams	248

LIST OF FIGURES

	<u>Page</u>
Figure 1.1 : John Cage, Jr. is in High School	8
Figure 1.2 : Merce Cunningham and John Cage, c. 1958.....	12
Figure 1.3 : Xenia Kashevaroff.....	16
Figure 2.1 : An example of the whole and divided six lines, hexagram no.62.....	22
Figure 2.2 : The symbol of the Yin Yang	23
Figure 2.3 : Eight figures of three lines	24
Figure 2.4 : Sixty-four figures of six lines, ordered by Fu His	32
Figure 2.5 : Early Heaven bu Fu Hsi	32
Figure 2.6 : Later Heaven by King Wen.....	41
Figure 2.7 : Correspondences between the trigrams, the seasons, the five elements and the eight directions	43
Figure 2.8 : Not Wanting to Say Anything About Marcel.....	44
Figure 2.10 : Master score for 17 Drawings by Thoreau	45
Figure 2.11 : Changes and Disappearances No.16.....	45
Figure 2.12 : Changes and Disappearances No.27.....	46
Figure 2.13 : On the Surface No.27	46
Figure 2.14 : On the Surface No.29	47
Figure 2.15 : The Bagua Map	48
Figure 2.16 : The final rendered plan of Barry R. Morse	49
Figure 2.17 : An example of a Magic Square	56
Figure 3.1 : John Cage, graphic notation for Fontana Mix	78
Figure 3.2 : John Cage, graphic score for Cartridge Music	81
Figure 3.3 : Prepared Piano.....	82
Figure 3.4 : Table of the preparations for Sonatas and Interludes	90
Figure 4.1 : John Cage, score of 4'33"	97
Figure 4.2 : The Horseshoe spread. The Tarot card-spread used by Cage in composing 4'33"	99
Figure 4.3 : Excerpt from Music for Carillon No.1, page 1.....	100
Figure 4.4 : John Cage, Water Music.....	103
Figure 4.5 : John Cage, Williams Mix, page 5	105
Figure 4.6 : John Cage, Radio Music, Part A	108
Figure 4.7 : John Cage, Concert for Piano and Orchestra, page 9-10.....	111
Figure 4.8 : John Cage's Score (sketch) for Atlas Eclipticalis	113
Figure 4.9 : Antonín Bečvář's sky atlas for Atlas Eclipticalis.....	113
Figure 4.10 : Short passage from the first three pages of Finnegans Wake.....	119
Figure 4.11 : Appendix of Cage's Etudes Australes.....	122
Figure 4.12 : Excerpt from Etudes Australes, Book I, No.1	123
Figure 4.13 : Graphic notation of Renga	126

Figure 4.14 : Excerpt from John Cage's Etudes Boreales	131
Figure 4.15 : John Cage, Where R=Ryoanji (4R)4 7-83, Pencil on paper.....	132
Figure 4.16 : John Cage, Ryoanji for Oboe, page 8.....	133
Figure 4.17 : John Cage,Ryoanji, percussion part, page 1	135
Figure 4.18 : I Ching hexagram chart	150
Figure 4.19 : Music of Changes, sound chart 2.....	151
Figure 4.20 : Sound chart no.1, cell no.1	153
Figure 4.21 : Example of the Measure 1	153
Figure 4.22 : Hexagram no.1, Ch'ien / The Creative.....	154
Figure 4.23 : Sound chart no.1, cell no.43	154
Figure 4.24 : Example of the Measure 3	154
Figure 4.25 : Hexagram no.43, Kuai / Break-through (Resoluteness).....	155
Figure 4.26 : Sound chart no.1, cell no.47	155
Figure 4.27 : Example of the Measure 1	155
Figure 4.28 : Hexagram no.47,K'un / Oppression (Exhaustion)	156
Figure 4.29 : Sound chart no.2, cell no.45	156
Figure 4.30 : Example of the Measure 1	156
Figure 4.31 : Hexagram no.45, Ts'ui / Gathering together (Massing).....	157
Figure 4.32 : Sound chart no.2, cell no.49	157
Figure 4.33 : Example of the Measure 1	157
Figure 4.34 : Hexagram no.49, Ko / Revolution (Molting)	158
Figure 4.35 : Sound chart no.3, cell no.3	158
Figure 4.36 : Example of the Measure 2	158
Figure 4.37 : Hexagram no.3, Chun / Difficulty at the Beginning.....	159
Figure 4.38 : Sound chart no.4, cell no.11	159
Figure 4.39 : Example of the Measure 1	159
Figure 4.40 : Hexagram no.11, T'ai / Peace	160
Figure 4.41 : Sound chart no.4, cell no.21	160
Figure 4.42 : Example of the Measure 2-3.....	160
Figure 4.43 : Hexagram no.21, Shih Ho / Biting through.....	161
Figure 4.44 : Sound chart no.4, cell no.35	161
Figure 4.45 : Example of the Measure 3	161
Figure 4.46 : Hexagram no.35, Chin / Progress	162
Figure 4.47 : Soun chart no.5, cell no.19	162
Figure 4.48 : Example of the Measure 1	162
Figure 4.49 : Sound chart no.5, cell no.33	163
Figure 4.50 : Example of the Measure 1	163
Figure 4.51 : Hexagram no.33, Tun / Retreat	163
Figure 4.52 : Sound chart no.5, cell no.41	164
Figure 4.53 : Example of the Measure 2	164
Figure 4.54 : Hexagram no.41, Sun / Decrease.....	164
Figure 4.55 : Sound chart no.6, cell no.17	165
Figure 4.56 : Example of the Measure 1	165
Figure 4.57 : Hexagram no.17, Sui / Following.....	165
Figure 4.58 : Sound chart no.6, cell no.27	166
Figure 4.59 : Example of the Measure 1	166
Figure 4.60 : Hexagram no.27, I / Corners of the Mouth (Providing Nourishment).....	166

Figure 4.61 : Sound chart no.6, cell no.57	167
Figure 4.62 : Example of the Measure 3.....	167
Figure 4.63 : Hexagram no.57, Sun / The Gentle (The Penetrating, Wind)	167
Figure 4.64 : Excerpt of the duration chart no.8	171
Figure 4.65 : Tempo chart in the Music of Changes.....	173
Figure 4.66 : Music of Changes, Book II. Measures 22-31	174
Figure 4.67 : Tempo chart, David Tudor Papers. 1884-1998	175
Figure 4.68 : The First Construction (in Metal), rhythmic structure	176
Figure 4.69 : Structure of a complete phrase group.....	177
Figure 4.70 : Structure of three-quarter-sized groups	178
Figure 4.71 : Structure of three-quarter-sized groups	178
Figure 4.72 : Score and constituent layers no.1	180
Figure 4.73 : Score and constituent layers no.2	181
Figure 4.74 : Score and constituent layers no.2	182
Figure 4.75 : Stroken on the keyboard lid and wooden strip	185
Figure 4.76 : John Cage, Music of Changes, Book II, fourth page.....	186
Figure 4.77 : John Cage, Music of Changes, Book IV, third page	187
Figure 4.78 : John Cage, Music of Changes, Book I, measures 33-34.....	188
Figure 4.79 : Sustain pedal (damper pedal)	188
Figure 4.80 : After the attack, sustaining overtones	189
Figure 4.81 : Una corda pedal (soft pedal).....	189
Figure 4.82 : Sostenuto pedal.....	190

JOHN CAGE AND HIS USE OF THE I CHING

SUMMARY

John Cage (1912 – 1992) is an American composer in twentieth century. Beginning with his work *Music of Changes* in 1951, he utilized the method of the I Ching (or Book of Changes), which is emerged around 3000 years ago in China and still practiced by the masters. This book, the most ancient system of wisdom, philosophy, and divination, gives answers to questions about the future with its sixty-four hexagrams. This thesis is primarily written to create a scientific research, which examines the connections between John Cage and the I Ching, his system of using this method as well as his works produced by consulting the I Ching. Additionally, it is explained, how this method used in religion and philosophy, medicine, visual arts, and architecture, as well as the purpose of the usage.

John Cage studied with one of the most important composers of the twentieth century, Arnold Schoenberg. During these studies, he realized that he did not have any interest for the classical and standard harmony, thus he started to seek for newness in the music. This seeking began with knowing and understanding himself better, and continued with learning Zen Buddhism and Indian philosophy. In the following years, he met the I Ching through Christian Wolff, a student of him. Briefly, he discovered how to eject his own tastes likes and dislikes, even his ego from the process of creating. After this discovery, he produced nearly thirty musical compositions, as well as visual and literary works by making use of the I Ching, which has not been applied by a known composer until this era.

The contents of the works of John Cage by utilizing the method of I Ching and their common features are explained in this thesis. Besides the charts, he created for sounds, durations, amplitudes, superpositions and layers, the hexagrams are also examined, which are matching with these charts. Furthermore, the facts about the other methods Cage used, such as *Indeterminacy* and *Prepared Piano* are described.

The purpose of this thesis is to create a scientific study that investigates the influences of this ancient Far-Eastern method on John Cage's music, the features of his works produced by consulting the I Ching, and the characteristics of this unconventional creating method.

JOHN CAGE VE I CHING METODUNU KULLANIŞI

ÖZET

John Cage, 1912 - 1992 yılları arasında yaşamış olan Amerikalı yirminci yüzyıl bestecisidir. 1951 ve sonrasında *Music of Changes* adlı eseri ile birlikte Çin'de ortaya çıkmış, en az 3000 yaşında olduğu tahmin edilen ve günümüzde hala başvurulana I Ching (Değişimler Kitabı) metodunu kullanmıştır. Dünyanın en eski bilgelik, felsefe ve kehanet sistemi olan bu kitap, içinde bulunan altmış dört hezagram (altı köşeli yıldız) aracılığıyla gelecek ile ilgili sorulan sorulara cevaplar veren bir metottur. Bu tez, öncelikle John Cage'in I Ching ile olan bağlantılarını ve I Ching'i hangi yöntem ile hangi eserlerinde kullandığını inceleyerek, bilimsel bir araştırma oluşturmak amacıyla yazılmıştır. Buna ek olarak, I Ching metodunun din ve felsefe, tıp, görsel sanatlar ve mimari gibi disiplinlerde nasıl etkili olduğu ve hangi amaçlarla kullanıldığı anlatılmıştır.

20. yüzyılın en önemli bestecilerinden biri olan Arnold Schoenberg ile çalışmış olan John Cage, bu çalışmalar sırasında standart armoniye karşı herhangi bir ilgi duymadığını fark etmiş ve müzikte yenilik arayışlarına yönelmiştir. Bu arayışlar kendini daha iyi tanımak ve anlamak ile başlayıp, Hint felsefesini ve Zen Budizm'ini öğrenmek ile devam etmiştir. 1946 yılında tanıştığı Gita Sarabhai'den Hint müziği ve felsefesi üzerine dersler almış olan Cage, ayrıca Japon bilgin ve yazar Daisetsu Teitaro Suzuki'nin Zen Budizm'i üzerine verdiği derslere de katılmıştır. İlerleyen yıllarda Christian Wolff adlı öğrencisi aracılığıyla tanıştığı I Ching sayesinde, özetle, sanatsal yaratılarında kendi özel zevkini, beğenisini ve hatta egosunu üretim sürecinden nasıl çıkarabileceğini keşfetmiştir. Bu keşif ile birlikte, daha önce başka bilinen hiçbir besteci tarafından kullanılmamış olan I Ching metodundan yararlanarak otuza yakın müzikal eser ve ayrıca görsel ve edebi yaratılar ortaya koymuştur.

Ses ve sessizlik arasındaki bağlantı ile derinden ilgilenmiş ve eserlerini bu iki öğeden yola çıkarak şekillendirmiş olan Cage'in en tanınmış eserlerinden biri olan *4'33''*, dört dakika otuz üç saniye boyunca sessizliğin sunulduğu bir başyapıttır. Bu eserde, yorumcu sadece bölüm geçişlerinde piyanonun kapağını kaldırıp indirir ve tek nota bile çalmaz. Ortaya çıkan tek müzik, izleyicilerin konser salonunda çıkarttığı uğultu/gürültü karışımı seslerdir. Cage bu eseri ile sessizliğin müziğin en önemli yapı taşlarından biri olduğunu anlatmayı amaçlamıştır.

Vurmalı çalgılara karşı büyük merak duyan besteci, 1938 yılında Seattle'da bir vurmalı çalgılar orkestrası kurduktan sonra, bu merakını piyano telleri ve tuşları üzerinde de denemeye karar vermiştir. Piyanyoyu bir vurmalı çalgı olarak kullanan Cage, *Prepared Piano* (Hazırlanmış Piyano) adını verdiği bir sistem ile piyano tellerinin arasına lastik, tahta, küçük ve büyük vidalar, bozuk paralar gibi cisimler yerleştirerek piyanodan daha önce duymadığımız sesler yaratmaya çalışmıştır. O dönemlerde aynı okulun bale bölümünde okuyan dansçı Syvilla Fort'un isteği

üzerine *Bacchanale* adındaki dans koreografisi için bu sistemi kullanarak bir eşlik yazmıştır. Daha sonra, yarattığı bu sistemi başka dansçıların koreografilerine müzik yazmak için de kullanmıştır. *Totem Ancestor* ve *Primitive*, Cage'in hazırlanmış piyano ile bestelediği dans müziklerine örnek teşkil ederler. Aynı sistemi solo piyano, iki piyano ve orkestra için de kullanan Cage, *Sonatas and Interludes*, *A Book of Music* ve *Concerto for Prepared Piano and Orchestra* gibi eserler bestelemiştir.

Yaklaşık 3000 yıl önce Çin'de ortaya çıkmış olan I Ching (Değişimler Kitabı), Çin felsefesinin atası olarak bilinir. I Ching, ona soru soran kişiye şimdiki zaman ve gelecekle ilgili neler yapıp yapmaması gerektiği konusunda cevaplar vermenin yanı sıra, kişiyi kötü kaderden korur. Bu kitap, hayattaki her türlü olasılığı altmış dört hegzagram (altı köşeli yıldız) ile eşleştirerek, kişiyi başa gelebilecek kötülüklerden korumak üzere bir takım tavsiye ve öğütler veren yazılı metinlerden oluşur. I Ching'in temeli Yin ve Yang adı verilen iki temel kuvvete dayanır. Yang erkek, sert, güçlü ve aydınlık enerjilerini temsil ederken, Yin dişi, yumuşak, zayıf ve karanlık enerjileri temsil eder. Trigramlar ve onların devinimleriyle ortaya çıkan hegzagramların kaynağı bu iki kuvvete dayanır. I Ching, antik bir Çince metin olan *Tao Te Ching*'in, Konfüçyüs'ün rasyonel hümanizminin ve Sun Tzu'nun analitik stratejisi olarak kabul edilen *Savaş Sanatı* adlı eserin başlıca kaynağı olarak görülmektedir. Günümüzde filozoflar, politikacılar, mistisizmle ilgileneler, simyacılar, yoga ustaları, kâhinler, büyücüler ve daha ötesi, bilim adamları ve matematikçiler tarafından kullanılan I Ching'in sakın bir şekilde doğru soru sorulduğunda, duruma tam olarak uygun olan bir cevap verdiği bilinmektedir.

I Ching'in çok zor olmayan fakat matematiksel bir kullanım şekli vardır. En önemli kısım, soracağınız soruya odaklanmak ve bu soruyu zihninizde belirginleştirmektir. Net bir şekilde ortaya konmayan sorular yanıltıcı cevaplara sebep olabilir. En eski kullanım yöntemi olarak kandil çiçeği sapıyla bakılan I Ching günümüzde Çin parası veya bozuk paralarla bakılmaktadır. Ayrıca gelişen teknoloji ile birlikte bilgisayar ortamında kullanılmak üzere oluşturulan programlar da mevcuttur. Bozuk para ile I Ching okuması yapıldığında tura olarak adlandırdığımız tarafın adı Yang'dır ve sayı değeri üçtür. Yazı olarak adlandırdığımız taraf ise Yin'dir ve sayı değeri ikidir. Yang için tek bir düz çizgi, Yin için ise iki kesik çizgi kullanılır. Düz ve kesik çizgilerden oluşan ve üst üste çizilen üç çizgiye *Trigram* (Üç-dizim), aynı şekilde çizilen altı çizgiye ise *Hegzagram* (Altı-dizim) adı verilir. Bozuk paralar düz bir zeminde toplam altı kez olmak üzere atılır. Elde edilen sayı altı, yedi, sekiz veya dokuz toplam değerine ulaşır. Altı; Yaşlı Yin, yedi; Genç Yang, sekiz; Genç Yin ve dokuz; Yaşlı Yang olarak tanımlanır. Soruyu sordumuz andan itibaren her atıştan sonra ortaya çıkan sayı yazılır ve hegzagram aşağıdan yukarıya doğru çizilmeye başlanır. Yaşlı Yang ve Yaşlı Yin'in ayrı ayrı gösterilebilmesi için onları bir daire ile işaretlemek gerekmektedir. Altı sayısı çarpı ile yedi sayısı nokta ile sekiz sayısı iki nokta ile ve dokuz sayısı bir daire ile temsil edilmektedir. Bu yaşlı çizgiler değişebilmekte ve bu altı çizginin birkaç noktasında yer alabilmektedirler.

I Ching ve chance operations (şansa bırakılmış müzik) uygulamasını ilk olarak *Music of Changes* adlı eserinde derin bir biçimde kullanan Cage'in eserin başlığını Değişimler Kitabı'ndan esinlenerek koymuş olduğu bilinmektedir. Cage bu eser için I Ching'e sorularak cevap almak üzere, ses, ses uzunluğu, dinamik, tempo, bileşen ve katmanlar için bir takım şemalar yaratmıştır. Bu şemalar sesli ve sessiz, hareketli ve

hareketsiz olmak üzere birbirine tamamen zıt olgulardan oluşan hücrelere bölünür. Cage bu hücreleri eşit bir dağılımla otuz ikisi sesli, otuz ikisi sessiz ve otuz ikisi hareketli, otuz ikisi hareketsiz olarak ayırmıştır. Bu şemalara göre tek sayılar, ses şemalarındaki sesli hücreleri gösterirken, çift sayılar sessiz hücrelerle eşleşir. Aynı şekilde, tek sayılar hareketli hücreleri gösterirken, çift sayılar hareketsiz hücreler için kullanılmıştır. Eserde, sekiz ses şeması, sekiz ses uzunluğu şeması, sekiz dinamik şeması, bir tempo şeması ve bir de bileşen ve katman şeması bulunmaktadır. Ses şemaları, piyanodan yeni sesler elde etmeyi, salkım akorlar kullanmayı, armoniyi en uç şekilde ortaya çıkarmayı ve piyano tellerinden parmak ya da tırnak yardımıyla yeni sesler üretmeyi amaçlayan ses hücrelerini temsil eder. Ses uzunluğu şeması hiçbir hücrenin boş bırakılmadığı bir şekilde tasarlanmıştır. Şema içindeki altmış dört hücre birlik ve otuz ikilik değerler aralığındaki notalardan oluşmaktadır. Eserin dinamik şeması *pppp* ile *ffff* nüans aralığına göre kurulmuştur. Bu şemada aynı zamanda aksanlar, *crescendo* ve *diminuendo*'lar yer almaktadır. Dinamik şemasında, altmış dört hücrenin sadece on altısı kullanılmış, geri kalan kırk sekiz hücre boş bırakılmıştır. Bozuk paralar atıldığında bu on altı hücreden biri gelirse, yeni bir dinamik yazılmakta, şayet kırk sekiz hücreden biri gelirse, bir sonraki rakam ortaya çıkana kadar eski dinamiği kullanmaya devam edilmektedir. Tempo şemasının ana kaynağı hızlanan ve yavaşlayan tempolardır. Altmış dört hücre ile düzenlenen bu şema, otuz iki aktif (tempo içeren hücre) ve otuz iki pasif (boş bırakılan hücre) tempodan oluşur. Bozuk paralar atıldığında tek sayı geldiğinde tempo değiştirilmiş, çift sayı geldiğinde ise tempo bir önceki haliyle kalmaya devam edilerek kullanılmıştır. Son olarak, Cage, zayıf ve yoğun seslerle bestelemek adına bileşen ve katmanlardan oluşan bir şema ortaya çıkarmıştır. Bu şemaya göre, örneğin, dokuz ile on altı arasında bir hegzagram ortaya çıktığında iki katmanlı, elli yedi ile altmış dört arasında bir hegzagram ortaya çıktığında ise sekiz katmanlı bir yoğunluk kullanılarak besteleme oluşumuna devam edilmiştir. Bu tezde, spesifik olarak Cage'in *Music of Changes* adlı eserinde kullandığı ses, ses uzunluğu, dinamik, tempo, bileşen ve katmanlar için yaratmış olduğu şemalar ile bu şemalarla eşleşen hegzagramlar, nota örnekleri ve hegzagram sembolleri aracılığı ile ortaya konulmuştur.

Amerika ve Avrupa'da entellektüeller, yazarlar, şairler, fizikçiler, psikologlar, filozoflar, roman yazarları ve film yapımcıları tarafından kullanılmaya başlayan I Ching, John Cage'in bu metodu müzikte kullanmaya başlaması ile birlikte, 20. Yüzyılda yaşayan diğer bestecilerinde ilgisini çekmiş ve bu sistemi eserlerinde kullanmalarını sağlamıştır. Kanadalı besteci Andrew Culver bu isimlerin önde gelenlerindendir. Elektronik müzik ve bilgisayar müziği ile yakından ilgilenen besteci, 1980'lerde Cage'in asistanlığını yapmış ve ayrıca bozuk para ve kandil çiçeği sapı ile okuma yapılmasının çok zaman isteyen bir teknik olması sebebiyle, IC (I Ching) adını verdiği, hızlı cevap alınabilen bir bilgisayar programı kurmuştur. Cage'in I Ching'e olan derin merakı dolayısıyla bu sistem üzerinde çalışan ve onu benimseyen bir diğer isim de, Cage'in uzun yıllarca büyük bir dayanışma ile ortak projelere imza attığı dansçı ve koreograf Merce Cunningham'dır. Cunningham, 1950'lerde kendi koreografileri için I Ching kullanmaya başlamış, dansçıların nerede ve ne zaman sahneye girip çıkacakları, dans müziklerinin uzunlukları, koreografinin oluşumu, el, kol ve ayakların nasıl hareket edeceği ve bu hareketlerin nasıl değişeceği ile ilgili sorularını I Ching'e danışmıştır.

Adeta bir kâşif gibi daimi olarak yeni arayışlar ve yeni tekniklere ilgi duyan Cage, rastlamsallık ve şansa bırakılmış müziğin de öncüsü olmuştur. Eserlerinde, gerekli kurallar dışında yorumcuyu özgür bırakmak ve hatta yorumcuya esere katkıda bulunma şansı vermek Cage'in besteleme sisteminin en önemli parçalarından biridir. Bu tezde, John Cage'in I Ching metodu kullanarak bestelediği eserlerin içerikleri, nasıl bestelendikleri ve bu eserlerin tipik özellikleri anlatılmıştır. Ayrıca Cage'in kullandığı diğer iki metot/teknik olan *Indeterminacy* (Belirsizlik) ve *Prepared Piano* (Hazırlanmış Piyano) hakkında da bilgiler sunulmuştur.

Bu tezin sonucunda varılmak istenen nokta; eski bir Uzak Doğu metodu olan I Ching'in John Cage'in müziği üzerinde yarattığı etkilere, bestecinin bu kitaba sorarak aldığı cevaplarla nasıl bir müzik yarattığına ve bu standart olmayan besteleme yöntemi ile ortaya çıkan müziğin/eserlerin ne gibi özelliklere sahip olduğuna değinerek bilimsel bir araştırma ortaya koymaktır.

1. INTRODUCTION AND JOHN CAGE'S LIFE

John Cage (1912 – 1992) is an American composer in the twentieth century. He permanently searched on newness and is known by his unconventional manner. Prepared piano, chance operations and his usage of the I Ching are the most significant examples of his searches on new methods and techniques, and his experimental work 4'33 is a masterpiece that presents the term “silence” (to listen and try to understand the silence), which he learned with Zen Buddhism. Later on, he met with I Ching and continued to learn, how to remove his own ego with these systems.

I Ching or Book of Changes is an ancient method of fortune telling, based on wisdom and philosophy. It is presumably emerged around 3000 years ago in China and still practised by the masters. This method gives answers to questions through its 64 hexagrams (patterns of six broken and unbroken lines). It works by asking a question about something unclear in the mind, trying to find and understand the answer and finally acting in accordance with it.

John Cage is the first known musician in the twentieth century who applied this method in his own works. He employed it not only in his music, but also in his writings and visual works. Using I Ching method provides to compose a piece of music or draw a picture by a non-spontaneous decision. Therefore, he began with the utilization of this system for his chance operations. Composing accordingly to the I Ching method gives Cage a unique status, in the entire music history. However, he applied this method not only in his works such as in the third movement of Concerto for Prepared Piano and Chamber Orchestra (1950–51), *Music of Changes* (1951), HPSCHD (1969) or in Etudes Australes (1974–75). He also consulted the I Ching in his private life, when he was in trouble or unclear with his situation, and accepted the results with a certain loyalty.

In fact, nothing, what I read and learned in the searching process, have surprised me; because I already understood that I was not alone, when I learned in the course for the piano literature of the 20th century in MIAM that John Cage was interested in the

I Ching. This truly delighted me. During this entire semester, all composers and works, which I learned, fascinated me and I had to ask myself, why I was not interested in the music of 20th century until then. Also at this time, I had the idea to learn the connection between John Cage and the I Ching profounder. My intention in this thesis was to understand John Cage, his works and his usage of the I Ching; but it was also a great motivation to me, to learn and understand the I Ching, which I met first 13 years ago.

I was studying piano at Ankara State Conservatoire. I was practicing without any break, spending the whole day alone and forgetting even to eat something. Without any contact with other students, I was living totally introverted and after all the tiredness I could just find time to sleep. The only focus of my life was practicing and becoming a very good pianist, and for this reason, I was living an asocial, monotonous and unhappy life.

Then, I received a warning from above (heaven), which I identified years later as help or gift, and I was stopped. I had a big accident in February 2002. I had a six-part fractured foot and two fractures at my backbone. I could escape a paralysis with only one mm. and had two big surgeries, where six medical doctors and specialists worked collectively. I had to stay in hospital for a very long time and use permanently strong medication such as cortisone and morphine. I was a research object for medicine students. While answering their questions, I was thinking about the accident in depth. The only thing I had in my mind was returning to play the piano, and every single day I asked questions to my medical doctor regarding this. I had to live a big phase of silence and immobility.

To avoid a lost year and because I knew that playing piano was the only thing, which could take me back to life, I got a grip on myself and returned to school with my crutches. Some days later, a much-appreciated piano teacher wanted me to write three questions on a paper. It has been 13 years since then and I cannot remember my questions anymore. Because I was not able to walk, this piano teacher brought my questions to an I Ching master, and I received the answers on an audio cassette. Even though I cannot remember my questions, the answers are still on my mind. The master said: The sooner you learn to be in peace with yourself and love yourself, the better you will get well. I thought almost two years of this answer, and in this period I neither consulted the I Ching nor had any contact to this I Ching master.

Nevertheless, after these two years I called him and asked who he was what the I Ching was and how these answers came. Then I decided to face with all; the answers, Master and my life. To bear the answers of the I Ching is quite hard, because you could get answers you cannot tolerate or you would definitely not like. For this reason, it is recommended not to consult the I Ching, if you are not ready to accept the answers. As far as I experienced, there is a very low probability to get wrong answers. The only thing you should do is to focus on your question and to trust the I Ching, to the life and to the things, what life brings. Since September 2003, I have been permanently consulting the I Ching and asking important questions concerning my professional and private life; and it always saved me from a big mistake, or even from ignoring something quite important, although it seemed wrong or irrelevant to me at first sight. My spiritual life has begun with the I Ching, and then became profounder with reiki, meditation and yoga. These all guided me to keep staying in still waters. Thanks to this thesis, I could learn the history, structure and usage of the I Ching, which I only consulted to ask my questions in the past. Now I am able to ask my questions and receive the answers on myself. For a while, I have the intention to experience it alone, but when I feel myself more professional, I would like to use it for the sake of other people. Furthermore, I feel happy, when I find common points between John Cage and myself at this working phase.

Besides analyzing John Cage's musical experimentations and the new techniques and methods he discovered, the aim of this thesis is to seek and study – starting from the story based on my own life – the I Ching, the communication between Cage and the I Ching, and how he utilized it in his works, and finally to create therewith a scientific research.

1.1 Purpose of Thesis

The aim of this thesis is to discover John Cage's usage of the I Ching method. Nevertheless, the thesis will examine specific features of the I Ching, by explaining its origin, structure and its usage, and try to comprehend John Cage's works, which composed with it.

John Cage is first known composer, who created a number of unconventional works in music, writing and visual art with a new method called I Ching. Even if it is around 3000 years old, most of the musicians have less information about this

subject. However, John Cage learned to use this system with the coins and later a computer program has been progressed for him.

His extraordinary compositions and approaches to art gave way to a new era of thoughts. He is more philosopher than a musician, with his new ideas and innovative views on art.

The thesis will examine respectively these issues:

- looking at to the John Cage's life and works
- explain the history, structure and the usage of the I Ching
- John Cage's approach to the Indian philosophy and Zen Buddhism
- the impressions of the I Ching method on Cage's musics and works
- what kind of works John Cage created through getting the answers by asking to the I Ching method
- the features of the works which composed with an uncommon technique by John Cage and this method
- analysis of the work which are written with the I Ching method

When we talk about the I Ching, everyone has – more or less – an idea; but the musicians, who are informed of the creation, history and the process, how and by whom it is written, are mostly those, who are interested in the music of 20th century. Even though I Ching is a book, which is generally mentioned only in connection with John Cage and his works in music, I think it is important to make known this book by a large number of artists.

The “Book of Changes” teaches primarily “to accept”. This acceptance means to calmly agree with everything, whatever we experience in our lives, whether we name it “good” or “bad”. To achieve this, we should learn to stop fighting with ourselves and to get rid of our egos. Every artist, by nature, lives with his own ego and presents it. However, this fact becomes exaggerated and finally problematic to many artists, which I observe. Cage, in contrast, could learn to detach himself from his own professional experiences, even from his own aesthetic taste thanks to this book.

I Ching gives answers to the questions through 64 hexagrams. Each hexagram has a specific meaning, and additionally, ten interpretations – called “Ten Wings”, written

by Confucius – are existing. I Ching tells us not to consult it, if we are not willing to accept its answer and interpretations. As a person, who has been consulting the I Ching since 13 years, I have never witnessed that it guided me to a wrong path. Quite the contrary, the given answers made me always feel more protected, indulgent and open-minded and let my issues progressing much better.

One of the special points, which I have tried to explain in this thesis, is the fact that John Cage fought with himself to be able to remove his ego. I Ching was the most decisive system on his way. Musical analysis is surely essential to understand a musical piece and its composer; but for understanding Cage, a creating artist in various disciplines and with a multifaceted personality, it is also hugely important to understand I Ching, which took a highly influential role in the major part of his creative life.

This thesis is written to deeply examine the spiritual world, which I learned from the I Ching, and to share the emerging results with musicians, who are interested in Cage and his usage of this method.

1.2 Literature Review

This thesis contains gathering, analyzing and interpreting of the parameters and documents about John Cage and the I-Ching method.

In the research period, it has been used biographic books, magazines and encyclopedic resources about John Cage's life, his understanding of arts and his connection to the eastern philosophy. Furthermore, the CD and live recordings of David Tudor, Martine Joste, Joseph Kubera, Steffen Schleiermacher and Herbert Henck to analyze John Cage's *Music of Changes*, Book I. Besides, the characteristic and meaning of the I-Ching method have been thoroughly explored for understanding both the system of Book of Changes and the art of Cage's use in his works after 1951.

Since there is unfortunately no possibility to find sufficient materials in Turkey, a longstanding literature survey has been done abroad before beginning to the thesis. Most of the written and published materials for these topics were brought from the Libraries of Berlin University of Arts (UdK), Technical University of Berlin and Music Academy "Hanns Eisler". Some of biographic, historical and analytical

resources which based on John Cage's musical and technical thoughts were bought from the United States and England.

Furthermore, it has been utilized from the global resources on web, such as the articles and dissertations, and the written and oral interviews made before.

This dissertation had covered with musical and personal life of John Cage; the appearance, the development and the entire history of the I Ching as well as its profound meaning. Additionally, the impression of the I Ching on music and some other disciplines, such as religion and philosophy, medicine, architecture and visual arts has been observed. After the examination of John Cage's reasons for the use of the I Ching, I have underlined some other important figures, who were interested in the I Ching as well. Besides the I Ching method, Cage also worked with two other techniques; namely Indeterminacy and Prepared Piano. Thus, I have given general information about these techniques and wrote about the creation and substance of his works composed with these techniques. Afterwards, I have listed the compositions of John Cage which are composed with the I Ching and chance operations. All of these works are thoroughly analyzed and their features are presented. Cage's *Music of Changes* was known as the first distinctive work composed with the I Ching; therefore this work has been exhaustively analyzed. Some of the sound, dynamic, duration, tempo, rhythm and superposition charts that Cage created for composing and the other materials, which I could find in my resources as well as their use on the score, are shown. Finally, I have examined how Cage composed these works with I Ching and how different his approach to the music was than the usual Western sense.

While working on this dissertation, I have started to read the Book of Changes in a more detailed manner and could comprehend the symbols as well as their meanings much deeper. During my research, I have seen that Cage only used the number of the symbols as a mathematical parameter, but he did not consider the text and philosophical meaning of the Book of Changes. This point was interesting to me, because I have also found out that the I Ching for John Cage was more than a compositional tool in his life, especially in his personal life.

1.3 John Cage's Childhood and Early Life

John Milton Cage Jr. was born in Los Angeles on September 5, 1912, and died in New York City on August 12, 1992. Cage was an experimental, innovative and controversial composer. He was an avant-garde who worked on aleatoric (chance-controlled) and electroacoustic music, influenced by *Zen Buddhism* and Indian philosophy.

His father, *John Milton Cage*, “worked as a freelance inventor; cheerful, somewhat wandering in spirit, and a little absent-minded” (Haskins, 2012, p.17). His mother *Lucretia Harvey Cage*, is a journalist, worked for the *Los Angeles Times*, and “was part of a nationwide group of women that took leading roles in shaping both small- and large-scale cultural institutions of all sorts in America” (Haskins, 2012, p.18).

In the early years of the twentieth century, Cage began to take his first piano lessons from his Aunt *Phoebe James*. She was a singer, pianist and piano teacher. Cage learned how to sight-read with her (Silverman, 2012). According to Haskins (2012), moving quickly from one piece to another without feeling obligated to learn any single work thoroughly, made him have a supply of new experiences and new discoveries.

He was gifted for words. Young John created a Boy Scout radio program, and won the oratorical contest with his speech *Other People Think*, when he was fourteen years old. He graduated Los Angeles High School (see figure 2.1) as class valedictorian (Larson, 2012).



Figure 1.1 : John Cage, Jr. is in High School, (Silverman, 2012).

After graduation from the High School in 1928, he entered Pomona College, when he turned sixteen. However, he was disappointed with his college career¹; at Pomona, he felt a general aura of malaise and no longer interested in becoming a minister. In an interview with Kostelanetz (1993), he explained his glance about the collage as follows:

I was shocked at college to see one hundred of my classmates in the library all reading copies of the same book. Instead of doing as they did, I went into the stacks and read the first book written by an author whose name began with Z. I received the highest grade in the class. That convinced me that the institution was not being run correctly. I left. (p.237)

After two years, he convinced his parents, dropped out the college, and sailed to Le Havre (Perloff and Junkerman, 1994).

His goal of being a writer was now easier and for his education, he could spend most of his time with art. He studied Gothic architecture in the Bibliothèque Mazarine, read books on Gothic art, and worked drawing Greek columns, but one day when he heard that an architect had to devote his life to architecture, he resigned it (Haskins,

¹ From his straight A record at L.A High, he dropped at Pomona to the B and C level and he complained that at the college he had to read the same boks as everyone else (Perloff and Junkerman, 1994, p. 79).

2012). After a while, he pursued the new modern. “He wandered through Paris –at the time the world metropolis of advanced modernist painting –and spent hours studying striking new works by *Picasso*, *Klee*, *Matisse*, and their peers in the art galleries” (Larson, 2012, p.28). He also took piano lessons with *Lazare-Lévy*², discovered *Bach* and *Mozart*, and expanded his musical tastes with *Scriabin*, *Stravinsky*, *Bartok* and *Hindemith* (Haskins, 2012). He spent a year visiting Capri – where he met his first lover *Don Sample*³– Madrid and Berlin. In Mallorca, he painted and wrote poetry throughout the time and for the first time he tried to compose music (Silverman, 2012). In 1931, he and Don Sample back to the United States, and moved to Santa Monica. Cage took private lessons from American pianist *Richard Buhling*. He showed several pieces to *Henry Cowell*, who was the former student of Buhling. With Cowell’s suggestion, Cage sent some compositions to *Adolph Weiss* in New York. Although Cage did not have enough money to take private lessons, Weiss accepted him as a student (Silverman, 2012). In 1934, Cage set off for New York. “While studying with Weiss, Cage also studied at the New School with Cowell” (Silverman, 2012, p.14). Six months later, he felt ready to present himself to *Arnold Schoenberg*⁴ and went to Los Angeles. After many questions about Cage’s works, “Schoenberg accepted him into a private class in counterpoint at his home” (Silverman, 2012, p.17). They started to study and Cage composed for Schoenberg’s class. However, after a while Cage understood that he was not volunteer to study in the system of Schoenberg and finally they had a conversation as follows:

After I had been studying with him for two years, Schoenberg said, ‘In order to write music, you must have a feeling for harmony’. I explained to him that I had no feeling for harmony. He then said that I would always encounter an obstacle that it would be as though I came to a wall through which I could not pass. I said, ‘In that case I will devote my life to beating my head against that wall’. (Haskins, 2012, p.39)

² Lazare-Lévy was a noted pianist, organist, composer and teacher. He studied with Louis Diémer who supervised his studies at the Paris Conservatoire (Url-1).

³ Don Sample was a poet, who studied English literature at Harvard. They remained together for several years. He helped to shape Cage’s interests in art (Haskins, 2012).

⁴ At that time, Schoenberg was teaching music courses at the University of Southern California and UCLA (University of California at Los Angeles), and taking private pupils at home (Silverman, 2012).

1.4 Early Career

By the influence of *Oskar Fischinger*'s⁵ incarnate sound, Cage interested in Percussion music and the art of noise and this music moved him to another world. Modern dancers were great for him to have sounds or noises to use at the recitals. With his aunt Phoebe James, he gave courses, entitled "Musical Accompaniments for Rhythmic Expression" at UCLA (Silverman, 2010). In 1938, after he completed his studies with Schoenberg, began to work at the Cornish School in Seattle, Washington as a composer and accompanist for *Bonnie Bird*'s⁶ dance classes (Perloff and Junkerman, 1994).

In 1940, *Syvilla Fort*⁷, one of the dance students of Cornish School prepared her graduate recital on *Bacchanale*, the piece that she worked with Cage. For composing a dance accompaniment, the musical response of Cage followed on earlier innovations by Cowell (Haskins, 2012). Including weather stripping, he inserted pieces of rubber, screws and bolts into a grand piano, and then he called it *Prepared Piano* (Silverman, 2012). At the end of the 1940 spring semester Cage resigned from Cornish and moved to San Francisco. There he served at the Mills College as an accompanist for dancers, and gave a course in the Music for the Dance program together with *Lou Harrison*⁸ (Silverman 2012). "For the 1941 academic year, *Moholy-Nagy*⁹ invited Cage to move to Chicago and teach a course called 'Sound Experiments' at the newly established School of Design (Haskins, 2012, p.44). There, "Cage wrote a percussion score for poet *Kenneth Patchen*'s¹⁰ script *The City*

⁵ Oskar Fischinger was born in Germany but in 1936 he set sail for Hollywood never to return to Germany. He was an abstract filmmaker and painter (Moritz, 2004).

⁶ Bonnie Bird: An American modern dancer and international dance educator. She was a Martha Graham dancer in the 1930's and she worked with Cage as well.

⁷ Syvilla Fort was the first African-American student dancer at Cornish School. Cage honored her as "extraordinary" (Larson, 2012).

⁸ Lou Harrison was a student of Henry Cowell. He was interested in new means of producing sounds and wrote for percussion as well (Silverman, 2012).

⁹ Born in Hungary in 1895, Moholy-Nagy had been an influential teacher at the Bauhaus. In 1937, he became director of the New Bauhaus, and in 1939, he and other faculty members renamed the School of Design in Chicago, which was an abandoned bakery, but was used as a school (Silverman, 2012).

¹⁰ Kenneth Patchen was a West Coast poet, writer and painter. In 1957, he pioneered in the "public birth of poetry-jazz" by reading his poems to the accompaniment of jazz (Patchen, 2012).

Wears a Slouch Hat, broadcast nationwide on CBS”¹¹ (Larson, 2012, p.93). In 1942, after the open invitation of *Max Ernst*¹², Cage came to New York and stayed in Ernst’s house, which was shared with his wife *Peggy Guggenheim*¹³. Here Cage met such important personalities as *André Breton*, *Gypsy Rose Lee*, *Piet Mondrian*, *Marchel Duchamp*, *Jackson Pollock* and *Edgard Varése* (Haskins, 2012). Peggy Guggenheim was a person who really supported Cage a lot. However, once, happened an unpleasant incident between them. In a conversation, Cage explained the situation and his feelings as follows:

Peggy had agreed to pay for the transport of my percussion instruments from Chicago to New York, and I was to give a concert to open her gallery, ‘The Art of This Century’. Meanwhile, being young and ambitious, I had also arranged to give a concert at the Museum of Modern Art. When Peggy discovered that, she cancelled not only the concert but also her willingness to pay for the transport of the instruments. (Kostelanetz, 2003, p.12)

Later on, Guggenheim gave up supporting Cage and wanted him to leave her home. Cage moved to dancer *Jean Erdman*¹⁴’s house and stayed there for two months. Jean Erdman and *Merce Cunningham*¹⁵ (see figure 1.2) were working with *Martha Graham*¹⁶.

¹¹ CBS: Colombia Broadcasting System.

¹² Max Ernst (1891-1976), German surrealist artist who brought *Dadaism* from Paris to Cologne. He developed the techniques of painting (Jones, 2013).

¹³ Peggy Guggenheim (1898-1979), was an American art collector. She was the niece of the creator of the *Solomon R. Guggenheim Foundation* (Gill, 2003).

¹⁴“Jean Erdman, had been dancing since her childhood at the Punahou School in Honolulu, Hawaii, and she continued in the performing arts when she entered Sarah Lawrence, adding strong interests in art history, Buddhism, and Irish culture” (Larson, 2012, p.100).

¹⁵ Merce Cunningham, was a dancer at the Cornish School, where he and Cage first met. Cunningham sometimes played in Cage’s percussion group” and Cage accompanied to his dances on the piano as well (Silverman, 2012, p. 60).

¹⁶ Martha Graham was a dancer and choreographer. She was an artist of the twentieth century, who choreographed more than 180 dances, based upon exhalation and inhalation of breath (Ware and Braukman, 2005).



Figure 1.2 : Merce Cunningham and John Cage, c.1958, (Haskins, 2012).

They asked Cage to write some music for a dance, and so *Credo in US* was emerged (Kostelanetz, 2003). In 1943, Cage gave his debut concert at the *Museum of Modern Art*, in New York. In this concert, Cunningham, Erdman and Kashevaroff¹⁷ performed in the percussion orchestra (Larson, 2012). For the event, he gathered fourteen percussionists. Nearly 125 instruments featured many kinds of drums as well as electrical sound equipment and a prepared piano (Silverman, 2012). “From then on, Cage’s work was regularly discussed in the New York musical press and in the pages of such journals as *Modern Music* (Pritchett, 1996, p.11). In 1946, he met with his new companion *Gita Sarabhai*¹⁸. Gita’s wish was to study Western music and therefore she came to the United States. Cage offered to teach her about

¹⁷ Xenia Andreyevna Kashevaroff, daughter of the Eastern Orthodox Russian-Greek archpriest of Alaska, married to John Cage. She was an artist, who even performed in Cage’s percussion ensembles. She had interested in fine bookbinding, sculpture and collage (Silverman, 2012).

¹⁸ Gita Sarabhai, she was an Indian, who studied Hindustani singing, drumming and music theory (Silverman, 2012).

contemporary music; in return, he asked that she teach him about Indian music (Silverman, 2012). Cage mentioned Gita Sarabhai as follows:

We began to read the works of Ananda K. Coowaraswamy¹⁹ and we met Gita Sarabhai, who came like an angel from India. She was a traditional musician and told us that her teacher had said that the purpose of music was to concentrate the mind. (Kostelanetz, 1993, p.41)

Later, Cage's studies helped him with Indian aesthetics and its emotions; the heroic, the erotic, the wondrous, the mirthful, sorrow, fear, anger and tranquility (Haskins, 2012). In 1948, Cage and Cunningham got an offer from the Black Mountain College, where the experimentalist artists were supported well. Here Cage presented his debut of *Sonatas and Interludes* and devoted the summer to lecturing. Since there were no pupils, he arranged a festival of *Erik Satie's* music (Larson, 2012).

Late in the thirties at the Cornish School, there was a lecture on *Zen* and *Dada*, which impressed Cage very much. However, he was not impressed sufficiently to read Zen texts. In the middle forties, when he divorced from Xenia, and got into depression, instead of Zen, he involved with Oriental philosophy (Kostelanetz, 2003). Then he began searching on the literature of Zen Buddhism. The works of *Ramakrishna*²⁰ and *Aldous Huxley*²¹ made him approach more to the spiritual life. Now the connection between art and spirituality was more important to him (Pritchett, 1996). He began traveling from Greenwich Village to Columbia University, to attend classes on Zen Buddhism, which were taught by *Daisetz Teitaro Suzuki*²². He found new directions in his personal and musical way of thinking (Silverman, 2012).

¹⁹ "Ananda K. Coowaraswamy was an Indian art historian and critic, who had a strong impact on Cage's approach to music (Pritchett, 1996).

²⁰Ramakrishna: Sri Thakur Gadadhar Chattopadhyaya Ramakrishna Paramahansa, the Hindu mystic (1836-1886), was the teacher of Vivekananda (Larson, 2012, p.125).

²¹ Aldous Huxley: English writer and philosopher (1894-1963) who interested in parapsychology and mysticism.

²²Daisetz Teitaro Suzuki was a philosophical scholar of Zen, who considers the arts an important part of Zen practice (Silverman, 2012).

1.5 Later Career

The aesthetic conviction was important for Cage in breaking down the barriers between art and life. This conviction drew Cage to use many techniques by the Dadaist movement, which resulted as simultaneity and chance methods (Bernstein and Hatch, 2000). One day with a gift came from *Christian Wolff*²³, Cage began to use a new method. Wolff brought him the English translation of *I Ching*, the Chinese *Book of Changes*, which was published in 1950. For Cage, this book meant to open the heart to chance and change. In 1951, Cage composed his work *Music of Changes* (Larson, 2012). In an interview, he spoke on I Ching as follows:

I was first introduced to the *I Ching* by Lou Harrison before I went to Seattle, and it made no impression on me, but I remembered it. And later, Christian Wolff brought me a copy that his father had just published—of the Bollingen edition, a translation from the German of Wilhelm by Cary Baynes. At that point, when I saw it—I’m speaking now of the chart with the hexagrams—I suddenly understood how to write *Music of Changes*. (Dickinson, 2006, p.40)

Using the I Ching method, Cage composed considerable works, such as *Music of Changes*, *Imaginary Landscape no.4* and *no.5*, *Music for Piano* and *Two Pastorales*.

“Although his early percussion works gave noise a musical vitality that went far beyond the Dadaist and futurist experiments, this new direction in his musical style was influenced, in part, by the historical avant-garde” (Bernstein and Hatch, 2000, p.13).

The notion of ‘the birth of the silent piece’ had been with him for years. He knew that Harvard University had an anechoic chamber, a room with sound-absorbing baffles to suppress echoes and noises. In the room, he heard two sounds, one of them was high and the other was low. The engineer explained him that, the high one was the sound of nervous system and the low one was the blood (Silverman, 2012). Being in silence impressed him very much. In 1952, he composed a new work, completely different from his early pieces, titled ‘4’33”. The first performance was on 29 August

²³ Christian Wolff, was the youngster student of Cage. His father was a Publisher (Larson, 2012).

in Woodstock, New York, by the performer *David Tudor*²⁴. The piece was for the piano, but every phrase was silent. Nevertheless, some very quiet sounds were going on in the work, such as; air moving, the breathing of the audience, their physical rustling in chairs and with programs, and squeaking chairs (Haskins, 2012).

In the 1950's, he had worked on electronic music and magnetic-tape pieces, then in the 1960's he began once again to focus on electronic music. In June 1960, *Walter Hinrichsen*, the founder of the *C.F.Peters Corporation*, agreed to publish Cage's works and in 1962, distributed the published works through their international outlets (Silverman, 2012). In 1961, he was made a fellow at Wesleyan University, where his lectures and essays published. Then in 1967, he was made a composer- in-residence at the University of Cincinnati. The two following years 67' through 69', he was at the University of Illinois and then the University of California (Kostelanetz, 2003). At Illinois Cage conceived an electronic extravaganza entitled *HPSCHD*, an international project of harpsichord, which consisted of the tape compositions of fifty-one-computer-generated, distributed around the room, created hot spots of sound (Larson, 2012). "During the early '70s, Cage changed his life perhaps most dramatically in shifting much of this attention from composing to writing" (Silverman, 2012, p.257). Many of his essays and lectures published, and his writings issued by Wesleyan University Press. Nevertheless, between 1974 and 1977, he returned to composing, moving away from the electronics. He began with a traditional classical etude form, and in 1975, he composed very difficult piano pieces, *Etudes Australes* and *Freeman Etudes* (Silverman, 2012).

In January 1978, Cage began an activity in visual art at *Crown Point Press*, where he made artworks such as drawings, prints and watercolors. He used a variety of techniques in printmaking, engraving, aquatint and dry point (Haskins, 2012). Cage's visual art works described as follows:

At Crown Point Press, which is now located in San Francisco, Cage produced 27 groups of prints, mainly etchings, and the groups contain all together 667 individually composed works of art. Cage had begun his work as a visual artist in 1969 in New York with a print project, but it was nine years

²⁴David Tudor, 1926-1996. He studied piano, organ and composition. He gave the American premiere of Boulez's Sonata No.2 in 1950. Tudor was one of the virtuoso pianists of the avant-garde music (Dickinson, 2006).

later, with his first Crown Point visit, that his sustained art activity began. After his introduction to etching on that first visit, he spent five years on four complex projects. Then, in 1983 he simplified his printmaking approach, and also began drawing. In the nine years after that until he died, he produced about 150 drawings at home in New York, in between regular work periods at Crown Point Press. In that period he also made 114 watercolors in two sessions at the Mountain Lake Workshop in Virginia. That is the bulk of Cage's visual art. (Brown, 2000, p.46)

Over the 1980s, most composers of electronic music were using computers. Cage as one of them composed his *Europerras 1&2* between 1987 and 1991. This opera for Cage was "an extension to all the elements of theater of the separation that has long existed between dance and music" in his work with Merce Cunningham (Dickinson, 2006, p.228). "His last performance took place on 23 July when he performed one of the parts of his *Four* (1992)" (Haskins, 2012, p.145).

1.6 Personal Life

Between 1934-1935 when Cage was working at his mother's art and craft shop, he met with *Xenia Kashevaroff* (see figure 1.3). It was love at first sight on Cage's part. He proposed marriage at the first dinner that he took Xenia, and in 1935, they married in Yuma, Arizona (Silverman, 2012).



Figure 1.3 : Xenia Kashevaroff, (Larson, 2012).

The marriage took ten years, until it fell down by an intense and brilliant love emerged between Cage and Cunningham. Xenia surely was aware of this sexual

interest, which grew between Cunningham and his husband, and she felt sad and alone. On the other hand, it was obvious that Cage needed being himself. Finally, in 1945, Cage divorced his wife and, Cunningham remained as the partner of Cage until the end of his life (Larson, 2012).

1.7 Cage's Health Problems and Death

He had many serious health problems including arthritis, sciatica and arteriosclerosis. When he was sixty-five, the dental problems affected his right eye; in addition, he did not wear glasses, although he needed. In 1989, severely itching eczema appeared in his arms, legs; moreover, he fell and injured his foot. When Cage approached eighty, he was unable to sleep or work (Silverman, 2012). After all, "on 11 August 1992, he suffered a massive cerebral hemorrhage and died the following day in St Vincent's Hospital (Haskins, 2012, p.145).

1.8 His Notable Awards and Achievements

In 1949, Cage was awarded a fellowship from the *John Simon Guggenheim Memorial Foundation*. The same year, he received a grant from the *National Institute of Arts and Letters* for his work with percussion orchestras and his invention of the prepared piano (Kuhn, 2010). He also received grants from ASCAP²⁵, *Koussevitzky Music Foundation*, *Thorne Music Fund*, and *The New York State Council* (Silverman, 2012). In 1981, *Louise Nevelson* presented Cage with the *Mayor's Award of Honor for Arts and Culture at NY's Gracie Mansion*, (Kuhn, 2010). The same year in Paris, he was awarded "the *Commandeur des Arts et Letters*, the highest grade of its awards for significant contributions to the arts" (Silverman, 2012, p.321).

In 1987, "he had received an offer from Harvard University to serve as Charles Eliot Norton Professor of Poetry for 1988-89" (Silverman, 2012, p.376). Two months later, he was elected to the American Academy of Arts and Letters. In 1989, he was awarded the *Kyoto Prize* (Silverman, 2012). In 1991, he received the *Lifetime Achievement Award* at the *Frederick R. Weisman Art Awards 1991 Gala*, in a lavish outdoor ceremony at the *Los Angeles Country Museum of Art* (Kuhn, 2010).

²⁵ ASCAP: The American Society of Composers, Authors and Publishers.

Throughout his life, Cage was known as a tireless provocateur and propagandist of avant-garde musicians, artists, and writers, but today his work is recognized around the world (Bernstein and Hatch, 2000).

2. I CHING, THE BOOK OF CHANGES

2.1 What Is I Ching?

The I Ching is a very ancient and profound book. It had emerged nearly three thousand years before. The source of the I Ching comes from the Chinese culture. Originally, it was a book of ancient wisdom for divination. The book not only “tells one who consults it about the present situation and future potential but also gives instruction about what to do and what not to do obtain good fortune and to avoid misfortune” (Huang, 2010, p. xviii). It is a very expensive document that you can apply for the situation which you concern about.

The I Ching is the ancestor of all Chinese philosophy, and “the primary source for the pragmatic mysticism of the *Tao Te Ching*, the rational humanism of Confucius and the analytic strategy of Sun Tzu’s *Art of War*” (Yi, 2006, p. ix). The book “contains a series of chapters describing *every possible life situation*. In addition to describing everything that *can* happen to you, the I Ching also offers, based on thousand years of observation, extremely specific descriptions of what is most likely to happen next” (McElroy, 2005, p.3). “It has been considered a book of fundamental principles by philosophers, politicians, mystics, alchemists, yogins, diviners, sorcerers, and more recently, by scientists, and mathematicians” (Cleary, 1986, p.4).

2.1.1 The origin of the I Ching

I Ching began almost 3.000 years ago in Chou dynasty China, as a divination manual and it placed at the center of Chinese cosmology and philosophy. Its origin and early development is conjectural (Hacker, Moore and Patsco, 2002). I Ching pronounced as *Yee Jing*, or *Book of Changes*, is one of the oldest Chinese works. “*I*” means change, “*Ching*” means book or classic. “The basic symblos used in the I Ching have been found recorded on bone oracles from early antiquity” (Richards, 1999, p.2). Hacker, Moore and Patsco (2002, p.xiii) mentioned the origin of the I Ching as follows:

There are Chinese traditions originating long after the I Ching itself, that trace the book's origin to the mythical emperor Fu Hsi (c.3000 BCE), then provide a steady development through the founder of the Chou dynasty, King Wen, (c. 11th century BCE) and his son the Duke of Chou, before arriving at the set of standard commentaries attached to the text the 'Ten Wings', which are attributed to Confucius.

Some different combinations of the "Eight three-lines" (Trigrams) were also in ancient history. It is said that there are two collections which belong to the ancient period. The first one, is the "Book of Changes" called "Lien Shan", from the Hsia Dynasty. The second one is, "Book of Changes" called "Kuei Ts'ang", from the Shang Dynasty. Confucius mentioned this second book as a historical phenomenon. It is not known, if these sixty-four six lines existed in that ancient period, or not. It is also difficult to say, whether these sixty-four six lines are the same with current symbols (Wilhelm, 2002).

When it is talked about the ancient books, one of the most dramatic stories in the history of early China is the burning of the books. The first Emperor *Ch'in Shih Huang-ti*, with an idea that was proposed to him "by his prime minister, *Li Ssu* (220?-208 BCE), as a means of stifling dissent by restricting access to ideas inconsistent with the Legalist ideology of the Ch'in" (Adler, 1984, p.1). Li Ssu's memorial to the emperor in the *Shih Chi* (Historical Records), concludes as follows:

Your servant suggests that all books in the imperial archives, save the memoirs of Ch'in, be burned. All persons in the empire, except members of the Academy of Learned Scholars, in possession of the Book of Odes, the Book of History, and discourses of the hundred philosophers should take them to the local governors and have them indiscriminately burned. Those who dare to talk to each other about the Book of Odes and the Book of History should be executed and their bodies exposed in the market place. Anyone referring to the past to criticize the present should, together with all members of his family, be put to death. Officials who fail to report cases that have come under their attention are equally guilty. After thirty days from the time of issuing the decree, those who have not destroyed their books are to be branded and sent to build the Great Wall. Books not to be destroyed will be those on medicine and pharmacy, divination by the tortoise and milfoil and agriculture and arboriculture. People wishing to pursue learning should take the officials as their teachers. (Adler, 1984, p.2)

Although the imperial decision was approved, some people were able to hide the copies of the text. Even if it is said that I Ching is the only book which remained unharmed, it is an unfounded myth.

2.1.1.1 The divination text of the I Ching

I Ching is like a Holy Bible to the Chinese, which is written by the four honored sages in history; *Fu Xi*, *King Wen*, the *Duke of Zhou* and *Confucius*. “Sheng Ching” means Holy Bible in Chinese. “Ching” at the same time means “Classic”. (Huang, 2010). To the Chinese understanding, Ching is the Tao and the Truth, “the holiest of the ancient books, and because they revere and respect the sacred writings of the Jews and the Christian church, they honor the Bible by calling it Ching” (Huang, 2010, p.xvii). For this reason, according to Huang (2010), Chinese translations of the Holy Bible does not depart from the original text. He also thinks that translations of the I Ching should not depart from the original text.

The text consists of sixty-four short essays which symbolically expressed on important themes such as moral, social and political character. It is based on six lineal figures (see figure 2.1), some of which are whole and the others divided (Legge, 1963). The original meanings “intended by the three sages responsible for the earliest layers of the I: Fu-Hsi (the hexagrams), King Wen (the hexagram statements), and the Duke of Chou (the line statements) (Smith, Bol, Adler and Wyatt, 2014. p.173).

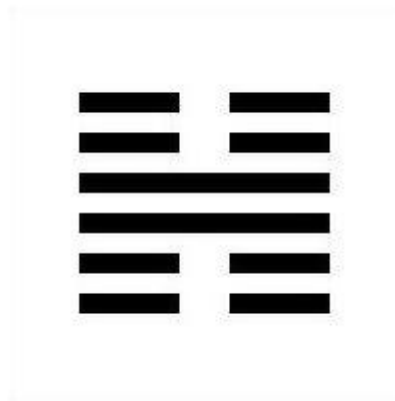


Figure 2.1 : An example of the whole and divided six lines, hexagram no.62, (Wilhelm, 2002).

2.1.1.2 Zhou Yi (Changes of Zhou)

There were three Oracles of Change; *Lien Shan*, *Gui Cang* and *Zhou Yi*, but only *Zhou Yi* survived as the I Ching. The I Ching was the divination text of the Zhou people. According to Huang (1984), “the Zhou people kept good records. In particular, the book *Zhou Li* (Zhou Rites), spells out details of their governmental

organization, and weights and measures”. “They reflected their beliefs, folklores and daily concerns” (p.22-24). “I Ching philosophy deeply influenced the political structure and literature of the Zhou Dynasty, from 1122 BC to 256 BC”. Confucious wrote a group of commentaries called “Shi Yi²⁶” which was also called “Yi Zhuan” or “Commentary on the I Ching” (Byrd, 2007, p.7). “All later texts about Zhou Yi were explanations only, due to the classic’s deep meaning (Ludden, 2012, p.236).

2.1.1.3 Yin and Yang

The philosophy of “change” based on *yin* (dark) and *yang* (light), which underlines of Chinese thinking. It was developed as a theory for the operation of the oracular hexagrams (Adler, 1984). According to Huang (1984), “the cosmology of Yin and Yang was foreign to Shang culture, that it was a creation of Zhou people, originated perhaps in their dim tribal past” (p. 22). The following figure 2.2 shows the symbol of the yin and yang.

²⁶ Shi Yi: Ten Wings



Figure 2.2 :The symbol of the Yin Yang, (Caroline Turner, 2014).

These contraries called Yin and Yang, were emerged at the time of *Ch'in* and *Han* Dynasty. In this period, there were a school which based on the doctrine of Yin Yang. This doctrine which imply *feminine* and *masculine*, appealed not only to Chinese, but also foreigners who study the Chinese philosophy (Wilhelm, 2002). In the peculiar sense, Yin means “negative, passive, weak, receptive, dark, and destructive; yang is positive, active, strong, assertive, light, and constructive” (Lin, 2008, p.24). According to ancient organizations, “Heaven and Earth, sun and moon were the four deities”. Heaven and Earth “represent the pure yang and the pure yin”. Sun and moon “represent yin within yang and yang within yin” (Huang, 1984, p.249).

I Ching is a combination of these two basic energies of yin and yang. In the book of Johnson (2001), its mentioned about the yin and yang principles as follows:

The movement of yin and yang is understood as the movement and expression of the Tao. The Tao is the invisible, unifying principle and energy that connects us all. The Tao is always changing, as is our life. Therefore the I Ching or Book of Changes, guides us through these changes by being an oracle of change. (p. 6)

The concept of Yin Yang “is taken from the Ten Wings, the Confucian interpretation and commentary on the I Ching that has been developed by Confucius and his disciples over many generations” (Lin, 2008, p.25).

2.1.1.4 Fu Hsi

Fu Hsi is the man who first united all of China and became its first emperor. He is “a cultural prototype believed to have taught his people the arts of hunting, fishing and animal husbandary” (Cleary, 1986, p.3). The original text of the I Ching refers to these activities. He is the man who attributed the creation of the I Ching. It is believed that, *Fu Hsi* created the *Trigram*, (see figure 2.3) eight figures of three lines each and the *Hexagram*, (see figure 2.4) sixty-four figures of six lines each (Wei, 2005).

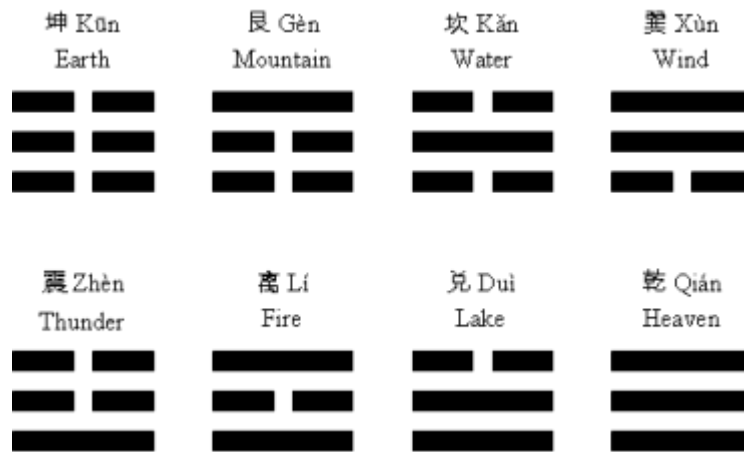


Figure 2.3 : Eight figures of three lines, (K. E. Eduljee, 2011).

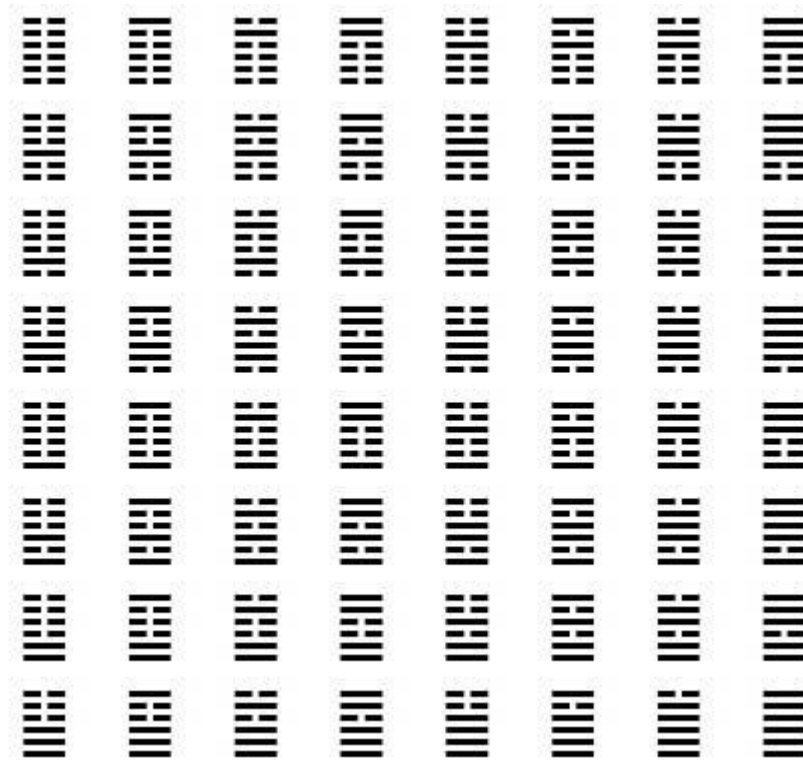


Figure 2.4 : Sixty-four figures of six lines, ordered by Fu Hsi, (Secter, 1993).

The Chinese call these symbols as *kua*. It is said that Fu Hsi to form the sixty-four kua, surveyed the vast different movements under Heaven. He saw how the movements met and became related, and saw their eternal laws. Since the writing did not exist at his time, Fu Hsi's teachings were handed down in the oral tradition (Wei, 2005). In the book of Hacker, Moore and Patsco (2002), it is mentioned how Fu Hsi thought on the I Ching. According to him, "it was simply the naturalness of a particular phase of material force, formed into the patterns and images seen in the Chart and the Writing that exposed this to his mind, and he lent his hand to it" (p. 1).

Although it is said that Fu Hsi was the creator of the I Ching and its trigrams (the eight figures of three lines) and hexagrams (sixty-four figures of six lines), according to Wilhelm and Baynes the arrangements of Fu Hsi is open to discuss. In the book of Hacker (1993), it is explained as follows:

According to Wilhelm/Baynes the Fu Hsi Arrangement of this trigrams "was already in existence at the time of the compilation of the Book of Changes under the Chou Dynasty". Hence, it can be argued that since a binary order of the trigrams existed during the Chou dynasty, a binary order of the hexagrams probably existed at that time. (p.113)

According to Hacker (1993), another possibility is that both King Wen's and Fu Hsi's arrangement might be derived from an unknown setting of the hexagrams.

2.1.1.5 King Wen of Zhou and his son, the Duke of Chou

King Wen is the eleventh-century B.C.E. leader. The Duke of Chou and King Wen are founders of the Chinese Chou Dynasty (1150-249 B.C). King Wen is attributed his first committing the text of the I Ching to calligraphy (Richards, 1999). The Duke of Chou and King Wen “are held up to history as models of enlightened rule” and “said to have collected or composed sayings attached to the sixty-four signs and to each of the six lines of which every sign is constructed” (Cleary, 1986, p.3). Many historical personalities, including King Wen’s son the Duke of Chou and Confucius contributed to its completed form (Richards, 1999).

King Wen worked on I Ching and wrote short explanations under the six-lines while being held as a prisoner of Chou Hsin from the Shang Dynasty. Until his son, the Duke of Chou overthrew the Shang Dynasty, Wen was not proclaimed ‘King’. King Wen died, without knowing that his son got back his title ‘King’. After this death, the Duke of Chou continued to practice on his father’s work and added comments to the lines (Wilhelm, 2002).

In the book of Legge (1963), the origin and formation of the text is mentioned as follows:

King Wăn takes them up, one after another, in the order that suits himself, determined, evidently, by the contrast in the lines of each successive pairs of hexagrams, and gives their significance, as a whole, with some indication, perhaps, of the action to be taken in the circumstances which he supposes them to symbolise, and whether that action will be lucky or unlucky. Then the Duke of Kâu, beginning with the first or bottom line, expresses, by means of a symbolical or emblematical illustration, the significance of each line, with a similar indication of the good or bad fortune of action taken in connexion with it. The king’s interpretation of the whole hexagram will be found to be in harmony with the combined significance of the six lines as interpreted by his son. (p.10)

The other son of King Wen, “Zhou Gong Dan, created the Yao Chi, or ‘Explanation of Horizontal Lines’ to explain the significance of each horizontal line in every hexagram. It was at this time that the deep meaning of the I Ching was finally understood” (Byrd, 2007, p.6).

King Wăn and the Duke of Kâu were familiar with the practice of divination in China. They would copy its methods and style for more than a year. Their words became oracles by the divined hexagrams which sought by means of what was said under them (Legge, 1963).

3.1.1.6 Confucius (551-479 BC)

Confucius is the humanistic philosopher of the sixth to fifth centuries B.C. His personal name is *Kong Qiu*, a.k.a. *Kong Zhongni*. He is an extraordinary scholar and educator. He is “known as an early transmitter of the Chinese classics and credited with commentaries that eventually became incorporated into the body of the *I Ching*” (Cleary, 1986, p.3).

He “is said to have been seventy years old when he first took up the Book of Changes” (Wilhelm and Wilhelm, 1995, p.8). In his senility, Confucius elaborated cavernously on this book, and he revealed an extremely valuable work for the organization of the hexagrams of the I Ching. His *T’uan Chuan* or *Commentary on the Decision* gives exact interpretations on the basic structure and the other elements of the hexagrams (Wilhelm and Baynes, 1967).

According to Confucius, “a true understanding of the symbol and its name of King Wen’s Decision on the gua is critical to gaining perspective on one’s present situation” (Huang, 2010, p. xxiv). He had diciplies which “repeatedly referred to several key ideas for understanding the I Ching: the superior person, the ability of humanity, the proper way to deal with change, working toward the goal of harmonizing society, and benefiting people” (Dietz, 2010, p.17).

It was Confucius, who said the I Ching had to be a small book, one should keep close at hand. Following the work of Fu Hsi, King Wen of Zhou, and his son, the Duke of Zhou, Confucius ultimately wrote the *Ten Wings*, the commentaries.

2.1.2 The Ten Wings

Ten Wings (ten chapters), also known as the *I (ta-) chuan*, or the *Shih i*, is the name of the commentary which added to the I Ching. Some of these commentaries “have by traditionally accounts been given very early dates”, but some of them “are even associated with Confucius”. It is difficult to give an exact date for these materials, but it seems that “they are quite late” (Taylor and Choy, 2005, p.521).

“Wing means ‘to assist’. The Ten Wings serves as a supplement to the text, helping people to understand the I Ching”. Although, “the authorship of the Ten Wings is attributed to Confucius”, in later studies, “they are said to have been written by diffirent Confucian scholars at diffirent times” (Huang, 2010, p.5).

Confucius did not rework or edit the Book of Changes, but he wrote enlightening comments. Huang (2010), wrote the names of the commentaries as follows:

- The first and second wings are: *Commentary on the Decision*
- The third and fourth wings are: *Commentary on the Symbols*
- The fifth and sixth wings are: *Great Treatise*
- The seventh wing is: *Commentary on the Words of the Text*
- The eighth wing is: *The Discussion of the Gua*
- The ninth wing is: *The Sequence of the Gua*
- The tenth wing is: *Miscellaneous Notes on the Gua*

Table 2.1 : Chart of the Ten Wings, (Ruth, 2002).

Wing	Title	Contents
1 2	Tuanzhuan I II	Hexagrams and hexagram statements 1-30 Hexagram and hexagram statements 1-64
3 4	Xiangzhuan I II	Daxiang I: Constituent trigrams 1-30 Xiaoxiang I: Lines of Hexagrams 1-30 Daxiang II: Constituent trigrams 31-64 Xiaoxiang II: Lines of Hexagrams 31-64
5 6	Dazhuan I (Xicizhuan) II	Theory, including Dayan (wand-counting symbolism); & comments on 8 line statements Theory, including Guzhe (civilization myths); & comments on 11 line statements
7	Wenyan	Four fragments on Hexagrams 1 and 2
8	Shuogua	Hexagram origins; symbolism on trigrams
9	Xugua	Mnemonic for the hexagrams in order
10	Zagua	Rhymed glosses on the hexagram tags

2.1.2.1 T'uan Chuan and Hsiang Chuan

In the book of Taylor and Choy (2005), the Sinologist Richard Wilhelm's explanations on the ten wings are reinterpreted. According to it, the first and second wings, called *T'uan Chuan* or *Commentary on the Decision* "is a text that adds interpretative material to the basic decisions or judgments. The basis for this material is an interpretation of the structure of the hexagram". The third and fourth wings,

called *Hsiang Chuan* or *Commentary on the Symbols* (or images), “discusses images associated with each trigram that composes the hexagram” (p.521).

2.1.2.3 Hsi T’zu Chuan

The fifth and sixth wings, called *Hsi T’zu Chuan* or *Ta Chuan*, or *Great Treatise*, “is also known as the *Commentary on the Appended Judgments*”. The *Great Treatise* is in two part, and “it is the largest and the most significant commentary” (Hacker, 1993, p.23). According to Swanson it is written to solve three problems. Hacker (1993), mentioned these as follows:

(1) To develop a cultural history based on semi-divine mythical kings; (2) To synthesize the information on the trigram and hexagram into one coherent whole; and (3) To integrate the I Ching with Yin Yang and Five Agent Schools. (p.23)

2.1.2.4 Wen Yen

The seventh wing, called *Wen Yen*, or *Commentary on the Words of the Text*, “addresses only the first two hexagrams of the basic text, and some scholars believe that it represents fragments of a much lengthier but no longer extant work” (Smith, 2012), p.59).

2.1.2.5 Shuo Kua, Hsü Kua and Tsa Kua

The eighth wing, called *Shuo Kua*, or *Discussion of the Gua*, or *Discussions of the Trigrams*, “provides a detailed discussion of the correspondences, images, and metaphors—for example, social statutes, bodily elements, and animals—associated with the trigrams” (Taylor and Choy, 2005, p.521). The ninth wing, called *Hsü Kua* or *The Sequence of the Gua* and the tenth wing, called *Tsa Kua*, or *Miscellaneous Notes on the Gua*, “shows some connection and often contain identical formulations”. The *Sequence of the Gua*, “is the basis for the present sequence of the hexagrams”, and the *Miscellaneous Notes on the Gua*, “contains a brief definition of the names of each of the hexagrams” (Wilhelm and Wilhelm, 1995, p.86).

The Confucian school, in 136 BCE, by adding “Ten Wings” to the text, “they not only formalized the ‘standart text’, which has come down to us today, but also promoted it to canonical status as one of the five ‘Confucian Classics’” (Hacker, Moore and Patsco, 2002, p.xiii).

2.1.3 Structure

The I Ching consists of lines, text and commentaries. Its signs are used more or less as an esoteric notation system for describing elements, process, and experiences in the developmental practices involved special uses of body and mind (Cleary, 1986).

The word “*Ching*” is divided into two sections according to the order of the hexagrams”. The “upper ching” contains hexagrams from one to thirty, and the “lower ching” contains the remaining thirty-four hexagrams (Chung, 1995, p.2).

These hexagrams “made up of six broken and unbroken lines”. The basic symbolic unit is *Trigram*. Trigrams “are formed by various combinations of three lines”. The hexagrams “are formed by combining individual trigrams”. These lines “symbolize the forces of action and change and all the phenomena of the universe”. The lines represents the yin and yang forces (Meylan and Chu, 1988, p.9).

2.1.4 Eight trigrams

Eight trigrams are also known as *Bagua*. Bagua means eight symbols or eight trigrams. Bagua or eight trigrams are used both in I Ching and Taoist cosmology. “The early Chinese thought that the world can be broken down to eight basic elements”. They are called by specific names; heaven, earth, thunder, mountain, fire, water, lake and wind. “They symbolized them by putting together three binary elements, resulting in the eight trigrams” (Huang, 1984, p.4).

These three trigram lines implies the three notions. “These are: Heaven (man to self); Earth (man to the world); and Man (man to man)” (Secter, 2003, p.16). Bagua or eight trigrams has two arrangements. The first arrangement called *Early Heaven* (see figure 2.5), was made by Fu Hsi. The second arrangement called *Later Heaven* (see figure 2.6), was made by King Wen.

“The eight trigrams came to be associated with various aspects and elements of the phenomenal world, all of which are somehow perceived to resonate together due to their same proportions of yin and yang” (Shima, 1992, p.11).



Figure 2.5 : Early Heaven by Fu His (Url-2).



Figure 2.6 : Later Heaven by King Wen (Url-2).

2.1.5 Sixty-four hexagrams

After the trigrams were made up, “a trigram was stacked on a trigram, making a hexagram” (Huang, 1984, p.4). The Book of Change is based on sixty-four hexagrams. It contains “sixty-four six line figures, each complex being composed of undivided and of divided lines”. “These hexagrams form the point of departure of what the book has to say. In the hexagrams, situations are symbolized; they are characterized by the appended names” (Wilhelm and Wilhelm, 1995, p.9).

Each text of hexagrams have a common leitmotif that runs through all six lines. These sixty-four hexagrams, reveal the present state of a person’s mind and it shows

what he should do as a next move. But, here the most important thing is to interpret the comments very well, because they have not regular meanings, conversely, they are sufficiently particular. I think, to realize and comment the symbols, it is essential to work deeply on the details of the symbols.

2.1.6 How to consult I Ching?

The ancient Chinese used sets of bones to consult I Ching. Nowadays, its used stalks, coins or wands. “The ancient users of the I Ching believed that spirits were communicating with them through the medium of chance, as expressed in the fall of the stalks, coins, or wands” (Sadler, 1996, p.4).

When you consult I Ching, you begin with a hexagram. These “broken (yin) or whole (yang) lines makes four different possibilities for each line” (Nelson, 2011, p. 11).

I will explain the consulting with the coins. You need only three coins to consult. They could be the chinese or the normal ones. For me, it is better not to use everyday coins. You could keep separate three of them for I Ching. When you hold the coins in your hands, you should clear your mind and concentrate yourself on the question which you would like to ask. According to my experiences, it is better not to ask, if your mind is confused, or if you are not able to focus on the question. At times like these, I Ching can not give you the exact answer, because your complex energy makes it complex as well. Nelson (2011), writes that, “The Sage requires respect. Frivolity will not do. Or, put another way: Ask a foolish question, get a foolish answer” (p. 14).

You throw the coins, six times, once for each line, concentrating on the question. The head sides of the coins valued at three, and tails valued at two. Hurn (2011), writes about the consulting as follows:

The first toss gives the bottom line and so on upward. The lines of a hexagram are lined from the bottom/ground up. Each toss of three coins will give you a total of six, seven, eight or nine. The six and nine lines changing, when you get the changing lines. The I Ching is giving its answer for the present with the first hexagram, and for the future with the second hexagram. When you get changing lines you just draw a second hexagram to the right or first to show the changing lines. (p. 12)

The manner of asking a question has also great importance. “Yes / no or either / or and multi-part questions should be avoided.” (Hurn, 2011, p.11). It could be asked

about a particular action and its effect, about a certain goal, or about the way or progress of a relation, and so on.

Murphy and Irving (2000) think that the actual experience in consulting I Ching is to contact with the Higher Self or the Subliminal Self. Essentially, all the answers lies in your subconscious depths.

2.1.7 Development and use

In the age of the first Emperor Ch'in Shih Huang Ti, I Ching was saved being burned unlike the other classics; nonetheless, Ch'in Shih Huang Ti deployed the Book of Changes as a book of fortune. Afterward, *Tsou Yen*²⁷, *Tung Chung Shu*²⁸, and *Liu Hsiang*²⁹ evolved the doctrine of Yin and Yang. The importance of this doctrine had began to be strong against to the Emperor's wrong comments (Wilhelm, 2002).

The notable scholars, *Wang Pi*, *Ch'eng I* and Chu Hsi arranged the book not as a book of fortune, but as a book of wisdom. Not long after, the book was accepted, and the philosophy of the governance had improved in connection with the book of changes (Schulz, 1982).

Confucius and Confucians had a great part in the growth process of the I Ching. They concentrated on the "ethical and moral interpretation of the book". In time of, the studies on I Ching was established "at the heart of the traditional Chinese cosmology". The Book of Changes first traveled to Korea, Japan and Mongolia, and later to the West (Hacker, Moore and Patsco, 2002, p. xiii). In the proliferation of the I Ching, the missionaries played a big part. Koreans, Japanese, Vietnamese and Tibetans was sent to China, to get useful information due to sharing it in the West. But no wonder the book required translation (Smith, 2012).

²⁷ Tsou Yen: Known also as Zou Yan, was the thinker of the Yin and Yang in the Chinese philosophy era.

²⁸ Tung Chung Shu: Known also as Dong Zhongshu, was a scholar in the Han Dynasty.

²⁹ Liu Hsiang: Known also as Liu Xiang, was an author, scholar and government official in the Han Dynasty.

2.1.8 Translations of the I Ching

It is said that, the first translation was made by *Nicolas Trigault*, who was a Flemish missionary from the Jesus Society. He had translated it in Latin, in the early seventeenth century. In the late seventeenth century, there were other names who interested in I Ching very much. One of them is *Joachim Bouvet*, who was a French Jesuit missionary. He introduced the I Ching to the well-known German mathematician and philosopher *Gottfried Wilhelm von Leibnitz*. “Leibnitz was awed by the I Ching’s use of binary arithmetic, which was then unknown in Europe. Leibnitz furthered the concept of binary arithmetic, which became the basic language of all computers” (Byrd, 2007, p.8).

The most useful and famous translations was made in English and German. Firstly, the Scottish sinologist *James Legge* had translated the I Ching in English, in 1882. After him, the German sinologist, theologian and missionary *Richard Wilhelm*’s translation published in 1923, in German (Hulskramer, 2004). In 1950, *Cary F. Baynes*, made the English translation of Richard Wilhem’s German translation, in two volumes. Nevertheless, the modern users may use the *Carl Jung*’s³⁰ explanations on the I Ching as well.

In the present day, I Ching is used in cosmology, astrology, numerology, meditation techniques, Taoism, Feng Shui, architect, music, medicine and physiotherapy.

2.2 The usage and influences of the I Ching in some other disciplines

2.2.1 Religion and Philosophy

The most often used term to summarize Chinese religion is *san jiao*, which can be translated as “three doctrines” or “three traditions” or “three religions”. This term describes the three most important and guiding ways of thinking and living: Confucianism, Daoism and Buddhism (Yao and Zhao, 2010, p. 11). They have been generally recognized as the central components of Chinese culture, and their

³⁰ Carl Jung: (1875-1961). He was a Swiss psychiatrist who was one of the first to say that the human psyche is by nature religious, and he is perhaps best known for his emphasis on the spiritual and the religious. He was a Pioneer in dream analysis and spent a great deal of his life exploring Eastern and Western philosophies (Casement, 2001).

religious and philosophical principles create the main focus of Chinese scholarship. Unlike other spiritual traditions, these components with their own religious and philosophical dimensions coincide with each other in Chinese faith system. Since they have been constantly exhibiting their religious or philosophical shades at different phases of history and at different grades of social structures (Chun, 2012), it is really difficult to define these systems merely as religion or philosophy with Western specifications of these terms.

2.2.1.1 Confucianism

Confucianism has been a deciding factor in Chinese history and culture. A profound inspection of the Confucian doctrine will expose its subsystem of religious ideas built on belief in Heaven, predeterminism, as well as divination, Yin Yang and Five Elements. These last three terms were mechanisms for knowing Heaven's wish and for looking through its secrets, in order to help men obtain well-being and avoid calamity (Yang, 1970). The main principles of social transformation in Confucianism are drawn mostly from the I Ching. The universal goal of Confucianism is to guide people to be self-motivated, self-controlled, and able to accept the responsibilities. It has the dual objectives of cultivating the individual and contributing to the realization of a harmonious society. Confucianism is a way of living, which seeks the synchronization of the universal systems to achieve both individual and collective fulfillment (Chung, 2000).

Confucius devoted the last period of his life to the study of the I Ching (Lim, 2001). In the *Analects*, he says "If I were given more years, I would study the *I [Ching]* at age fifty, and I would not have made any serious mistake" (Cheng, 1991, p. 25). Numerous interpretations of the I Ching show, how Daoism and Buddhism were combined in the Neo-Confucianism, which deeply influenced the premodern Chinese, Korean, Japanese and Vietnamese dynasties. The Chinese could and can integrate the religious diversity much more easier thanks to the both-and mentality, affected by I Ching, then the Western mentality with its either-or tendency (Chung, 2000).

2.2.1.2 Daoism (Taoism)

The sociologist Max Weber³¹ suggested that China would be understood functionally when Confucianism was deemed as the orthodox tradition, and Daoism as its heterodox equivalent (Shek, 2004). Taoism is a religious and philosophical system, which speaks for holistic well-being and ritual control of the spirit world. Even though it is frequently differentiated from Confucianism, it is recommended to consider Taoism and Confucianism as two features of the same religious tradition. Throughout the centuries, they have been contemplated with compatible terms in China (Nadeau, 2014).

Daoism is a native Chinese religious tradition, and its fundamental concern is the acclaim for the *Dao*, translatable as “the Way”. The “impersonal, simultaneously immanent and transcendent” Dao has four central aspects, such as “source of all that exists, unnamable mystery, all-pervading numinosity (sacred presence), and cosmological process identified with the universe as a whole” (Komjathy, 2012, p. 172). Taoism communicated and merged with many elements of what is identified as Chinese civilization. It is almost impossible to find *pure* Taoism, neither philosophical nor religious, because it simply embraced and integrated elements from different philosophical and religious traditions. Taoism has been developed and altered with Chinese culture and is therefore an essential part of it (Hu and Allen, 2005).

The I Ching is not only one of the crucial books of classic Confucianism, but it also built a major theoretical part of Taoism. The Yin-Yang theory offers a theoretical tool to describe universal laws; and it was recognized by both Confucianists and Taoists, even with their contentions. Therefore, any study of the East Asian systems needs to include the I Ching (Lee and McNulty (2003). It can be seen as a manual for placing the principles of Taoism into practice. Utilizing the I Ching is an element of the process of “coming to *your* Tao through *your* experience in reality” (Benson, 2002, p. 39). Taoists were agreed with the philosophy that the I Ching presents, especially with the necessity of harmony with the ceaseless interchange of

³¹ The leading social theorist of twentieth century, Max Weber (1864-1920) is recognised as a principal founder of modern social science together with Karl Marx and Emil Durkheim (Kim, 2012).

harmonious and disharmonious forces in the universe. In brief, the I Ching has a justifiable significance for the comprehension of Taoism (Fowler, 2005).

2.2.1.3 Buddhism

The single notable foreign force, which shaped the Chinese culture, was Buddhism. It arrived China in the first century B.C. and was modified (Scarborough, 1998) under the influence of the established traditional ways of thinking, so that Chinese Buddhism deviated from Indian Buddhism to a great extent. Therefore, numerous texts of Chinese Buddhism developed completely different from the principles of Indian schools (Nakamura, 1964).

The spirit of religion in China, including Chinese Buddhism, is essentially the spirit of wholeness in diverseness and diverseness in wholeness. This spirit is characterized by the *dao* (the way), the *de* (the virtues), and the *wu* (the awakening), and they all are represented in Chinese Buddhism as well. The source of this spirit is the creative transformation of the texts of the Yijing. The Chinese religions can be defined as different articulations of the creativity in the way of thinking in the Yijing, and their ideas of diverseness and wholeness are evidently influenced by the pattern of the Yijing, in both theoretical and practical views (Cheng, 2011).

Although the connection between the I Ching and Buddhism was indistinct, their intellectual exchange has a historical importance. In Japan, the interactions between them were more frequently than in China. I Ching was a building block of the - Mahāyāna Buddhist system in mediaval Japan (Ng, 2000), and also one of the most significant influences on Shinto³² in the Tokugawa period (Ng, 1998).

2.2.2 Medicine

Western medicine is established on physical objectivity. It utilizes experimental methods and describes the reasons of pathological changes in the organs, tissues and molecules (Hor, 2003). Depending on objective technologies and quantifiable facts,

³² Shinto: “Shintoism or Shinto, from the Sino-Japanese shin (gods) and to (way or dao) refers to the indigenous religion that existed in Japan before the introduction of Buddhism and has coexisted with Buddhism to the present” (Taliaferro and Marty, 2010, p. 214).

scientific studies utilize empirical and analytic-deductive methods, and prefer reductionism and linear causality. Therefore, the scientific observations have a tendency to deal with phenomena that can be noted and quantified in an objective way. The investigation methods seek to minimize variables, employ repeatable experiments and work with measurement as well as analysis on isolated factors and characteristic components (Qu and Garvey, 2008). The patient's symptoms and the elicited signs together constitute the diagnosis, a treatment is chosen on the basis of this diagnosis, and, if appropriate, the symptoms and signs are dissolved. Western medicine is focused on the allopathic diagnosis as a result of its prognostic and pathophysiological information. However, the symptoms are not considered to be the basic problem by most patient-centered modalities, but they are seen as the response of the body to the problem. Besides the mind-body schism, this is the most significant difference between Western and Eastern medical philosophy (Diamond, 2001).

The holistic and systematic concept of traditional Chinese medicine (TCM) is essentially different from the mentality of Western medicine, which is based on reductionism. With its methodology of holism, TCM has a unique role in advancing the evolution of life science and medicine (Wu, Chen and Jiang, 2012). This concept observes the various parts of the body as an organic whole, and emphasizes that these parts as well as the inside and outside of the body are systemically connected (Chen, 2004).

The key defining statement of TCM is "*Bian zheng lun zhi*", which means that treatment is primarily based on discrimination of patterns and not on diagnosis of diseases (Flaws and Finney, 1996, p. 1). By consulting the I Ching, one is presented with images of the patterns of the change operative at that point of time. When these patterns of change (zheng) are well balanced and help to well-being, that means the patient is in good health or recovering. However, when these patterns are unhealthy or tend to foster the collapse of the body and mind that means the patient is ill and should be helped with appropriate therapies and medications. TCM is founded on the recognition of these patterns and its efforts do nothing else than push the patient's pattern from a disharmonious trend to a harmonious course (Shima, 1992).

Beginning with the Han Dynasty, the principles of the Yi Jing were applied to the practice and theory of Chinese medicine. Through interpreting the trigrams and their

arrangements in diverse ways, they became associated with various parts of the body and the internal organs (Table 2.2). The circulation of the vital energy, blood, fluid physiology and their changes are understood in terms of yin and yang in Chinese medicine. They all are connected to the trigrams and their relationship to the internal organs as well as the five elements – metal, water, wood, fire and earth (Ji Wu and Bissio, 2007).

Table 2.2 : List of Trigrams and their association with parts of body and organs (Ji Wu and Bissio, 2007, p. 62).

Trigram	Part of Body	Organ
Qian	Head	Large Intestine
Kun	Legs	Spleen
Li	Chest	Heart
Kan	Abdomen	Kidney
Dui	Shoulders	Lung
Gen	Back	Small Intestine
Zhen	Hips	Liver
Xun	Feet	Gallbladder

For ancient Europe, the appearance of medicine is connected with the generations of texts, known as the *Corpus Hippocraticum*. For ancient China, it can be seen in the context of writings, which are gathered into the textual collection of the *Huang Di nei jing* (Unschuld and Tessenow, 2011). This is one of the oldest exhaustive texts on Chinese medicine, and discusses the relationship between human beings, heaven, earth as well as the physiological changes that happen in human beings in accordance with the rhythms of the seasons (see figure 2.7). These periodical changes in human and the natural world are also related with the cyclical changes that occur within the trigrams of the Yi Jing (Ji Wu and Bissio, 2007).

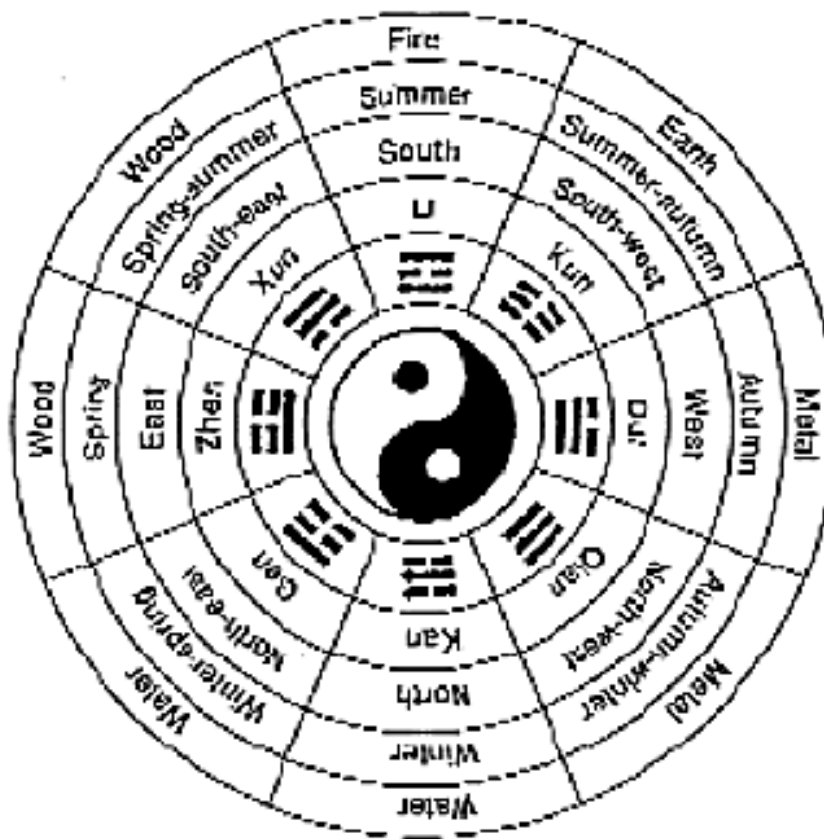


Figure 2.7 : Correspondences between the trigrams, the seasons, the five elements and the eight directions (Ji Wu and Bissio, 2007, p. 63).

Chinese medicine accepts that the life functions of a single person are not unconnected from the functions of the macrocosmic whole. Chinese philosophy in general believes that a person is only healthy, when the own functions are in harmonious balance and accord with the ruling functions of the universe. Therefore, it is important for the physician, to understand the patterns of change at work in the world, for being able to understand the disease mechanisms at work with the patients. Consulting the I Ching is a very old and authentic way of recognizing the patterns of the universe, as well as their relations to human beings at a specific time and place (Shima, 1992).

Acupuncture is a technique that is based on major theories of Chinese medicine. It uses very fine needles to stick the skin at particular places along energy channels or pathways, so called *meridians* and *collaterals*. These places are *acupoints*, and chosen in accordance with Chinese medicine theory to generate specific therapeutic effects (Xue and O'Brian, 2003). Acupuncture is applied to resolve inequalities of

yin and yang within the body, to regulate the metabolism and the interaction of the internal organs. The formulation of the correspondences between the meridians, the points used in acupuncture and the 8 Trigrams is resulted in the creation of the acupuncture methods based on Yi Jing (Ji Wu and Bissio, 2007). The valuable information from the Ten Wings of the Book of Changes shapes the fundamentals of I Ching acupuncture (Twicken, 2012).

The famous aphorism *Tong Bing Yi Zhi, Yi Bing Tong Zhi – Same Illness: Different Treatment, Different Illness: Same Treatment* means that two patients with the same diagnosis may receive completely different treatments if the pattern discrimination is different, while two patients with different diagnoses may receive the same treatment if their pattern discrimination is the same (Flaws and Finney, 1996). Modern Westerners are practiced in thinking in a linear and diachronic way; they tend to think as if things happen as a chain of cause and effect phenomena. But the language of the I Ching is symbolic and synchronic, its understanding of the world is like a web of various patterns, organically and synchronically intertwined without precise cause and effect relationships (Shima, 1992).

The Yi Jing explores material and immaterial reality, and its symbols and metaphors afford insight into the principles, which are controlling the life and the cosmos. Yi Jing's yin-yang method, with its analogic-inductive explanation, is a more proper instrument for this operation than the analytic-deductive mentality of the Greek tradition and contemporary sciences (Qu and Garvey, 2008).

2.2.3. Visual arts

The Eastern spiritual influences cultivated the works of John Cage into two disciplines, which he understood as intertwined: his musical compositions and his watercolors, drawings and prints. In both areas, his chance operations for compositional options were led by the I Ching (Spretnak, 2014).

Cage's work with visual art had practically the same manner as his work with music. The printers or assistants were like musicians, for whom he produced scores to execute. Even though the printers were essential, it was not co-operated work; then the vision was Cage's and he was the artist.

Cage's first visual art project, *Not Wanting to Say Anything About Marcel* (Brown, 2000) was a homage and memorial to Marcel Duchamp (see figure 2.8). Cage utilized the I Ching by the decision-making process concerning the structure and the elements. He also employed the I Ching to control the place of each of the images and text on each panel as well as its rotation, by using an overlaid grid – a technique, which Cage used in all his later visual works. The procedures of decision-making and structuring were taken directly from his musical compositional procedures employing the I Ching (Stones, 2013).

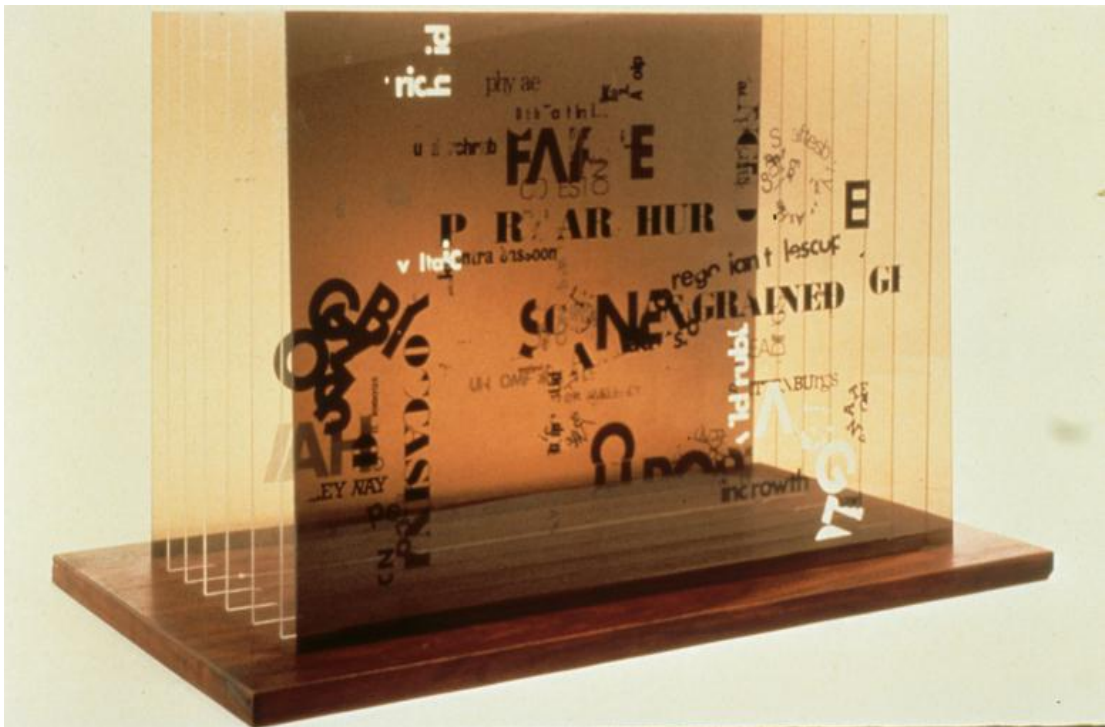


Figure 2.8 : Not Wanting to Say Anything About Marcel (Url-4).

In 1978, Cage was invited to work at Crown Point Press in California, and so he began his career as a printmaker, operating with etchings and monotypes. He explained the processes of his works *17 Drawings by Thoreau* (see figures 2.9 and 2.10) and *Changes and Disappearances* (see figures 2.11 and 2.12) as follows:

I made one series which was called *17 Drawings of Thoreau*. I took, through chance, certain drawings of Thoreau and enlarged them through chance operations and so forth. But when I put them on the copper, everything was done so that the drawing would be clear. In other words, I was following the kind of advice that one would receive if one was moving toward high fidelity. Then, in a subsequent series, called *Changes and Disappearances*, I subjected all of those activities to chance operations. And the result is some of the drawings disappear, and some of them are only faintly visible, and so on. And then there is dry point, and I've learned to engrave. As that particular series

continued, it moves from a kind of simplicity to quite a great complexity. Because I ask the question each time a plate reappears whether it's mobile or immobile; and if it's mobile, it receives a new image (Kostelanetz, 2003, p. 193).



Figure 2.9 : 17 Drawings by Thoreau (Url-5).



Figure 2.12 : Changes and Disappearances No. 27 (Url-8).

In his work *On the Surface* (see figures 2.13 and 2.14) Cage used randomly-cut plates of scrap copper. He utilized the I Ching to decide, how many and which of the sixty-four plates would be used for every single of the thirty-six etchings, where and at what angle they should be located (Pritchett, 1996).

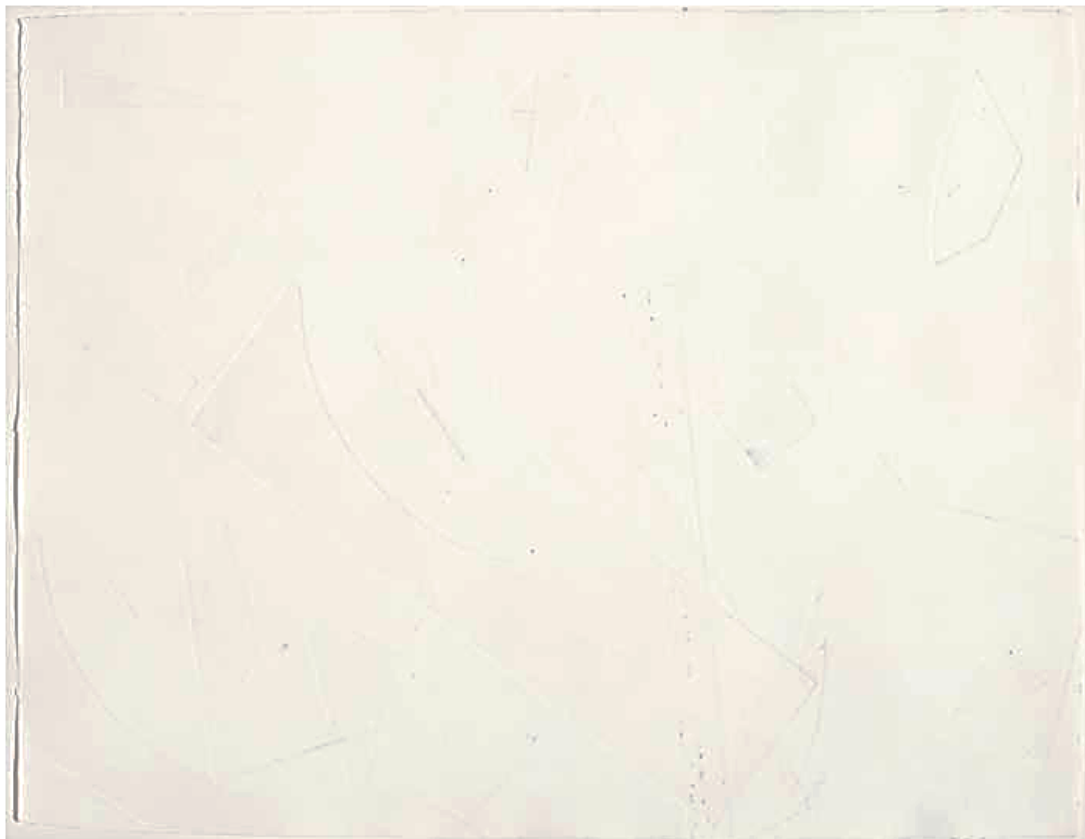


Figure 2.13 : On the Surface No. 27 (Url-9).

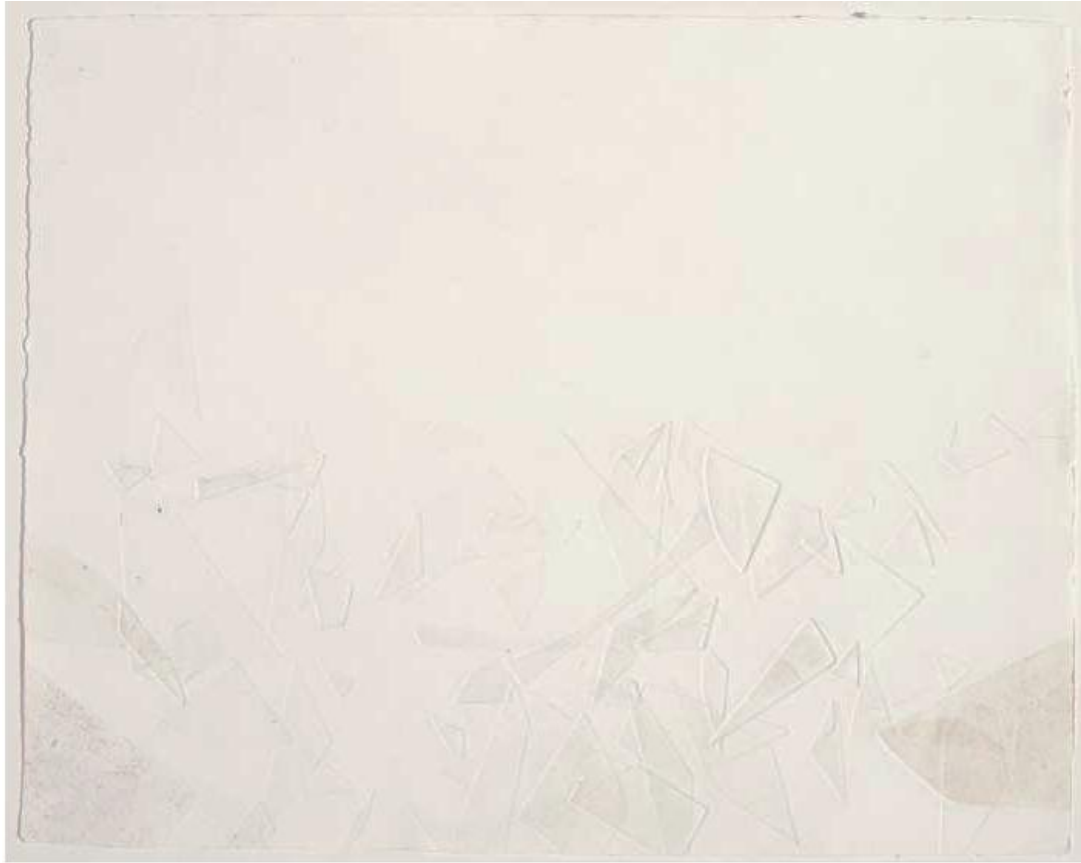


Figure 2.14 : On the Surface No. 29 (Url-10).

Cage produced 27 groups of printings, mostly etchings, and the groups include a total of 667 individually composed works of art at Crown Point Press. After his first visit in 1978, where he met etching, Cage spent five years on four complex projects. Then, from 1983 on, he simplified his approach and started to draw. In the following years until his death, he created – besides the regular work periods at Crown Point Press – about 150 drawings at home in New York, and also 114 watercolors in two sessions at the Mountain Lake Workshop in Virginia (Brown, 2000).

2.2.4 Architecture

Being in harmony with heaven, with earth, with humans and with self are the key themes in Chinese philosophy, which also influenced city planning and courtyard house design. Yin Yang, as balance and harmony, is an elementary idea, which deals with both human and nature matters. Supported by Yi Jing and established on examinations of nature, the ancient Chinese emerged the theory of Feng Shui (Wind and Water) to choose proper places for cities, villages, houses and graveyards (Zhang, 2013).

Feng Shui is a world of knowledge and operation, which has been progressing across the existence of Chinese history and civilization. Two different schools of practice in Feng Shui are existing: Compass and Form School. The Compass School is constituted of components and time in space, and underlines the transcendental hypotheses of cosmology, which derived from Yi Jing (Mak and So, 2011). One of the most effective implements in Feng Shui is the Bagua Map (see figure 2.15), which derives from the I Ching. The trigrams of the Bagua Map are each connected with particular “treasures” in life, including healthiness, prosperity, love and creativity. In the practice of Feng Shui, the Bagua Map is employed to place the areas correlating to these treasures and to give significance to every single part of the building. The success arises from the combination of ageless wisdom of the I Ching and the user’s aim to realize a positive change in life (Collins, 2008).

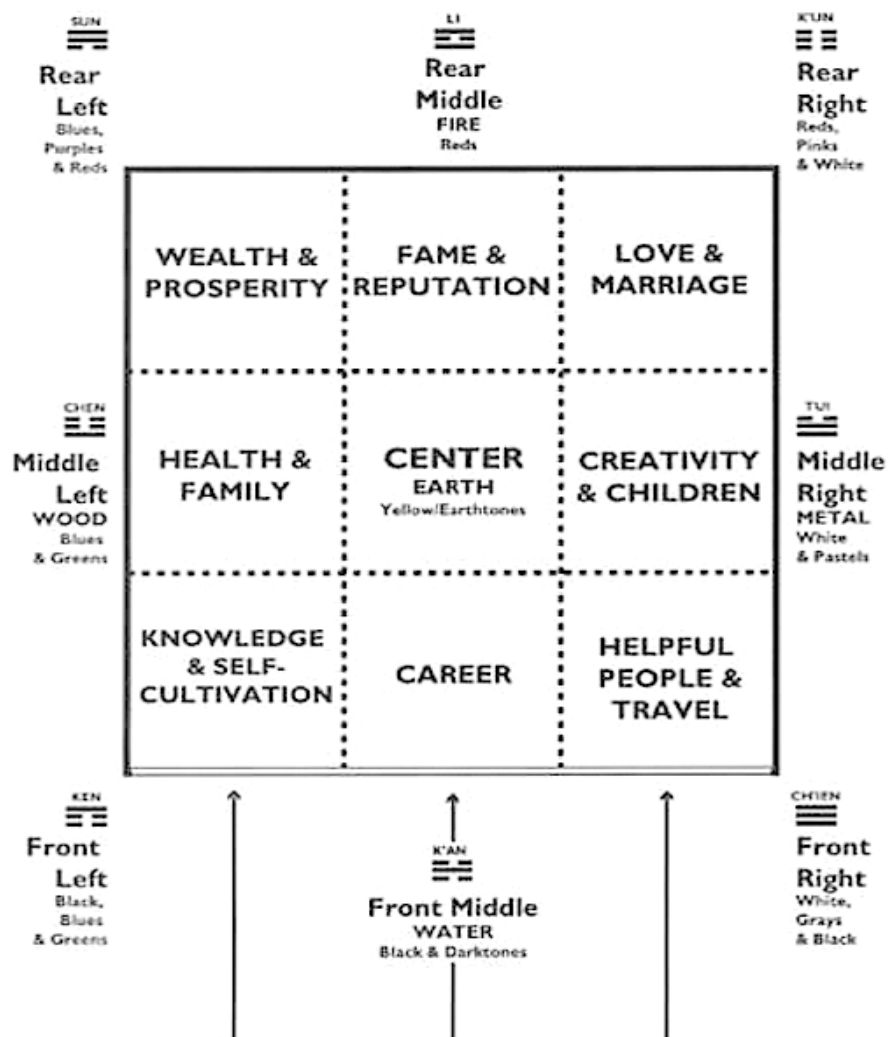


Figure 2.15 : The Bagua Map (Collins, 2008, p. 167).

In his thesis for master's degree “Indeterminacy, the *I Ching* and John Cage: A New Design Method for Landscape Architecture”, Barry R. Morse tried to discover, how the method of I Ching based chance operations of John Cage can be applied to a landscape architectural design (Morse, 2007, p. 1). Using the concept of Cage with its preparations (i.e. choosing various materials, setting parameters, creating rules, charts, and equivalency tables) and complying with the Plaza Project Program Outline given by the University, he shaped a new design for The University of Arizona Alumni Plaza (see figure 2.16) on the basis of the answers, which he received from the I Ching after his consultations.

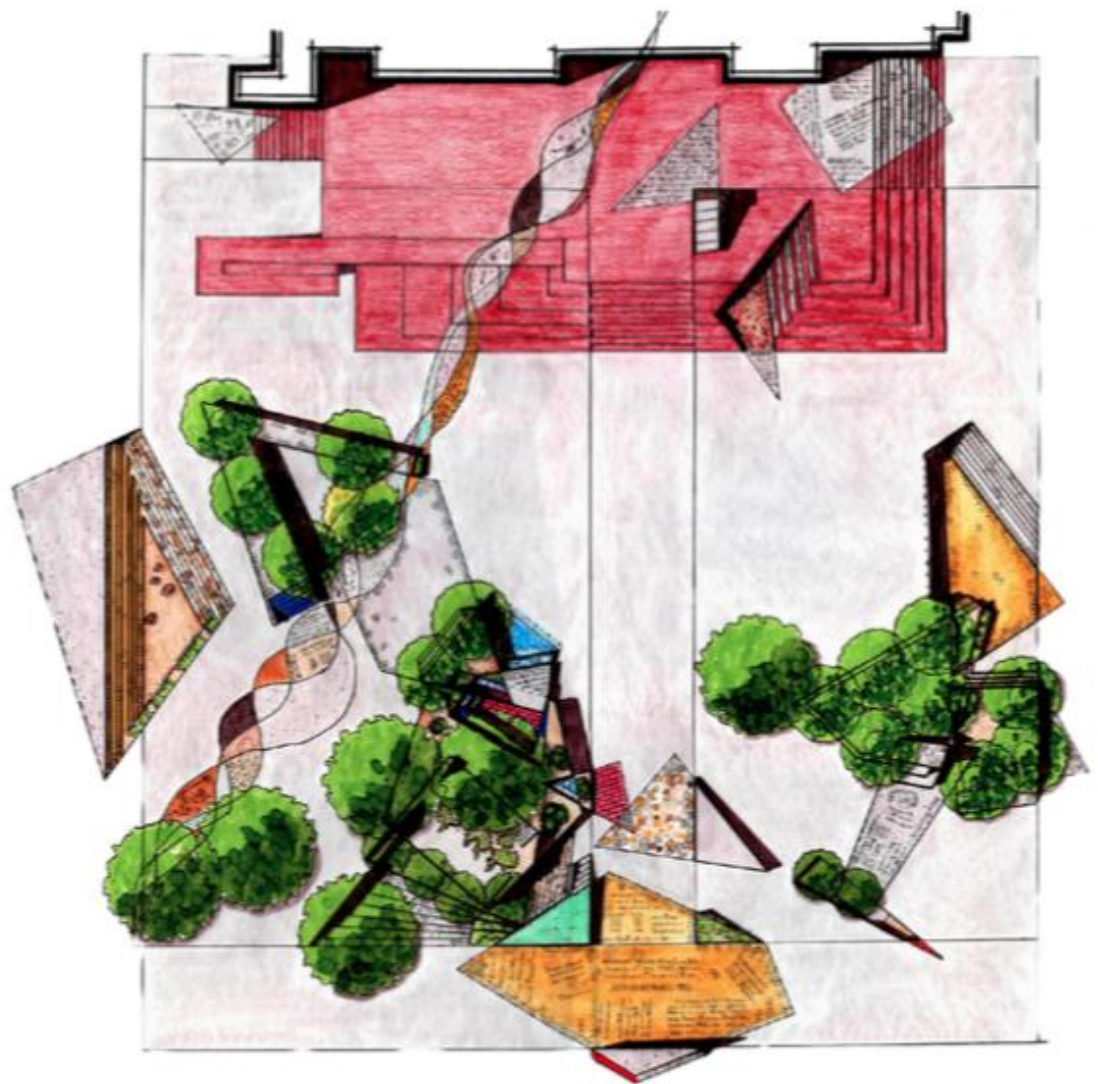


Figure 2.16 : The final rendered plan of Barry R. Morse (Morse, 2007, p. 106).

The following points are examples from Morse's work and the decisions he made respecting the answers of the I Ching to appropriate questions:

- The generation of the polygons (for sketching sections with particular purposes), as well as the quantity, dimensions, locations, appearances, elevations, connections, and orientations of them.
- Pathways for circulation into and through the plaza.
- The numbers of trees and their placement.
- The start and end sides of a shady tree line.

Morse shows the process in detail and describes that he utilized – with only a small number of modifications – Cage’s own method of chance operations. Afterwards, this design project was introduced to two professional and one professional architect with different backgrounds, who were unaffiliated with his thesis. These architects compared the project with the existing design of the plaza and another redesign of him that was created as a part of a coursework at the University Of Arizona School Of Landscape Architecture. The evaluation was based on their answers to 15 simple questions, which were formulating the goals of the Plaza Project Program Outline. As the result of this evaluation, his *indeterminate* design received the most points. Since this Comparative evaluation process was not very scientific, Morse underlines that it would not be correct to interpret the result too much. However, “the comparative evaluation’s value lies in its confirmation that the indeterminate process used in the thesis design was *at least* as effective as the more traditional, determinate design results” (Morse, 2007, p. 110).

2.3 The Reasons of Cage’s Usage of the I Ching

2.3.1 No feeling for harmony

In the fall of 1936 at UCLA, Cage enrolled in Schoenberg’s courses in harmony and counterpoint. At the lessons, Schoenberg was teaching his German “*Harmonielehre*”³³ and expected the students write “choral-school-forms”(Feisst, 2011, p.210). According to Schoenberg, in harmony the prerequisite of a composer was the skill. He thought that the harmony functioned as the central structural resource of a work, not as a coloristic chord-building(Revill, 2014). Schoenberg took

³³ Harmonielehre: Arnold Schoenberg’s book of “Theory of Harmony”, written in 1910.

harmony seriously, but Cage cared much about noise. He needed “wide-open acceptance of any sounds at all”. Finally, in a conversation between them, Cage told to Schoenberg that he had no feeling for harmony (Larson, 2012, p.58). “Cage was quite willing to deviate from his preconceived rhythmic plan, or in his own words, ‘play with and against the clarity of the rhythmic structure’ for expressive purposes (Nicholls, 2002, p.83). He was “interested in unconventional pitch relationships” and “become active” in creation (Feisst, 2011, p.210).

Although he craved to study with Schoenberg, Cage not long after quit the lessons with him. He simply needed to do experimental works. He wanted to learn and improve the notions such as “Oriental thought, the unity of nature, the properties of sound; about theories and problems in his own music” (Silverman, 2012, p.135). After many years, when he studied on Buddhism in 1975, Cage understood why he could not study with Schoenberg and his twelve-tone technique for composing. He recollected this situation as follows:

[T]hough we had gotten along beautifully for two years, it became more and more to me—and to him [Schoenberg]—that he took harmony fundamentally seriously, and I didn’t. I had not yet studied Zen Buddhism, curiously enough. When I did, which was about ten or fifteen years later, I would have had even more reason for not studying harmony [with Schoenberg]. But at that time, it was as though I was wrong, and what I was interested in was noise. The reason I couldn’t be interested in harmony was that harmony didn’t have anything to say about noise. Nothing. (Larson, 2012, p.59)

Cage thought that, the harmony happens “when you bring sounds together”. You discover it also when you have only one sound. “There is an inner harmony in each”. Cage preferred the many, and he wanted, “above all, anarchy, an absence of law with regard to coexistence of multiplicity” (Dickinson, 2006, p.203).

Cage had always great respect to Arnold Schoenberg and he mentioned him in his classes as well. On the other hand, he chose his own way to compose creative works, in the area of the avant-garde music.

2.3.2 Cage’s seeking for innovation and invention

After Cage quit the lessons with Schoenberg, Oskar Fischinger became an important figure to him. His “concept of incarnate sound animated Cage’s thinking about music the rest of his life”. He started to listen to “the tone and timbre of objects” much carefully than before, and thought on “sound sources” (Silverman, 2012, p.26).

Percussion music was an art of noise to him and he was extremely interested in it. He wrote "choral-school-forms" on percussion and gave lessons and concerts. Later on, he watched for the electrical instruments and electronic music. *Imaginary Landscape No.1*(1939) and *Credo in US* (1942) are the two examples of his percussion and electroacoustic music.

Merce Cunningham in an interview with Peter Dickinson, mentioned about Cage's unconventional ideas on composition as follows:

John has always worked in ways that were not conventional. His mind was not in the line most composers have followed. John has always allowed for the idea of noise as one of the sound elements in music, which has nothing to do with harmony. He has evolved another way of working with what sound does, then found ways to use that. From the beginning he spoke about dance and music as time arts, occupying lengths of time. (Dickinson, 2006, p. 58)

Cage's newness continued with his invention of the *Prepared Piano*. It was Cage's new musical instrument which is prepared before playing, by placing objects as screws, aluminium materials, rubbers and plastics to alter the sound of the piano. *Bacchanale* (1940) and *Sonatas and Interludes* (1946-48) are the complete examples of his prepared piano music.

2.3.3 Cage's new companion Gita Sarabhai and Indian philosophy

In 1945, Cage began to study Indian philosophy with Indian musician Gita Sarabhai. Gita came from his home Ahmedabad to America in order to study Western music. She asked Cage "for lessons in counterpoint and contemporary music", nevertheless Cage asked her to teach him "about Indian music and aesthetics" (Pritchett, 1996, p.36). "Before returning to India, Gita Sarabhai gave Cage a leaving present in the form of *The Gospel of Sri Ramakrishna's* teaching of living 'unattached in the world' made a lasting impression on the composer" (Lejeune, 2012, p.185). This book "would show Cage the image of a mind that is not at war with itself, or with anyone". Cage called the book as "a gift from India, which took the place of psychoanalysis" (Larson, 2012, p.125). He gave a year to finish the book. At the end, he learned the language of silence. When an interviewer asked Cage about the Eastern itinerary, he replied as follows:

When I discovered India, what I was saying started to change. And when I discovered China and Japan, I changed the very fact of saying anything: I said nothing anymore. Silence: Since everything already communicates, why wish to communicate? (Bernstein and Hatch, 2000, p.53)

In one of the conversation between Gita and Cage, she told him that the purpose of the music was to “sober and quiet the mind, thus making it susceptible to divine influences”. Cage thought on this idea and it affected him deeply (Brown, 2009, p.23). In his writings, the impression of these notions are seen. Cage’s 1952 Julliard Lecture shows his slow and calm sentences as follows:

To accept

whatever comes , re-gardless of the consequences
 , is to be unafraid or to
 be
 full of that love which comes from sense of
 at-
 oneness with whatever. (Leonard, 1994, p. 181)

After the Sri Ramakrishna, Cage discovered Aldous Huxley’s *The Perennial Philosophy*, writings from *Meister Eckhart*³⁴, *Huang Po*³⁵, *Lao Tze*³⁶ and Zen Buddhism. These texts had great impact on Cage’s life and music (Lejeune, 2012). Ananda Coomaraswamy’s book *The transformation of Nature in Art*, “which contained the statement ‘Art is the imitation of nature in her operation would be central to Cage for the rest of his life, however the application changed with chance and indeterminacy in the 1950s” (Fetterman, 2010, p.16).

2.3.4 Daisetz Teitaro Suzuki and lectures on Zen Buddhism

After Cage made his investigations on the world’s philosophies and religions, and quieting-changing the mind, he continued to renew himself with the Zen Buddhism in order to let the sounds be themselves (Leonard, 1994). He began to attend classes at the Colombia University. The classes were taught by Daisetz Teitaro Suzuki (1870-1966), who “was a philosophical scholar of Zen” (Silverman, 2012, p.108).

³⁴ Meister Eckhart: (c. 1260 – c. 1327). The thirteenth-century western mystic, as the great teacher of the birth of God in the soul, who shatters the dualism between God and the world, and the self and God (Eckhart and Schürmann, 2001).

³⁵ Huang Po: Hsi-yün. Chinese Zen master of the T’ang dynasty (618-907). He is one of the most famous and influential masters of the classical period (Baroni, 2002, p. 143).

³⁶ Lao Tze: Lao Tzu. (604 B.C- Sixth-century B.C). Chinese philosopher, who was “extremely influential on the development of the philosophical and the religious ideas that would later form the core of Taosim” (McDowell and Brown, 2009, p. 142).

Cage, in an interview made by Daniel Charles, mentioned the beginning of his interest in the Orient and Suzuki. He said that, Suzuki quite often suggested the students read *Chuang-tze*. Cage read and reread this book and he deeply admired the writing and the thought. He added that, “*Chuang-tze* is full of humor... One of the characters, Chaos, is more loved than feared” (Cage and Charles, 1981, p.94).

Actually, late in the thirties, Cage had heard a lecture given by Nancy Wilson Ross, at the Cornish School. At that time, the Zen texts had not impressed him sufficiently, but after his divorce from Xenia, he required help “as an individual”. Instead of a psychoanalysis, he “got involved with Oriental philosophy” and according to him, Zen characterized him “by an insistence on an utterly realistic approach” and made him end in humor (Kostelanetz, 2003, p.13). Cage’s compositional concerns was shaped by his interest in Zen. He mentioned what he learned from Suzuki, in an interview with Daniel Charles, as follows:

What Suzuki taught me is that we really never stop establishing a means of measurement outside the life of things, and that next we strive to resituate each thing within the framework of that measure. We attempt to posit relationships between things by using this framework. So, we lose things, we forget them, or we disfigure them. Zen teaches us that we are in reality in a situation that decentering in relation to this framework. In this situation each thing is at the center. Therefore, there is a plurality of centers, a multiplicity of centers. And they are all interpenetrating and, as Zen would add, non-obstructing. Living for a thing is to be at the center. That entails interpenetration and non-obstruction. (Cage and Charles, 1981, p.91)

Facing with the necessity of living as a particular, Cage found a way to conduct his life. His study of Zen made him balance his various temperamental inclinations, and he preferred to be in silence (Revill, 2014). Zen study led Cage “directly to his mature aleatory art”(Leonard, 1994, p.147). His “notorious silence should be understood primarily as a product of this Zen availability to experience. More specifically, that silence functions as a space for primary experience within the normally ‘filled’ space of music” (Higgins, 2002, p.85). His masterwork 4’33 is the milestone of this silence.

2.3.5 Meeting with the I Ching

The first time I Ching was introduced to Cage by Lou Harrison, in the San Francisco Public Library, approximately 1936. Harrison gave him a copy of translation made by James Legge, in 1882 (Revill, 2014). Harrison mentions the event as follows:

I read the I Ching at UCLA when I was working with Schoenberg and the dance department [1942-43]. My idea was to create a ballet in which there was a white backdrop. The dancers would toss the image, and the character would be painted in broad red brush strokes on the back part of the stage. Then the dance would be done to that image. A second toss would determine the next phase. The I Ching would determine a set of positions and where and how to move between them. Though I have thought of the possibility, I never seriously considered tossing for the actual notes and rhythms. Later in New York I introduced John to the I Ching. Then Merce took it up as well. (Miller and Liebermann, 2004, p.50)

Although at the first time I Ching made no impression on Cage, later he would be interested in it closely as it is written in Harrison's speech above. In 1950s, Cage began teaching a sixteen-year-old composition student and friend Christian Wolff. His parents Kurt and Helen Wolff were the book publishers and "among their issues were the works of Carl Jung" (Silverman, 2012, p.101). Cage gave lessons to Wolff free of charge. In return, Wolff brought him an English translation—pocket version—of the I Ching, which had been published in 1950. Cage was instantly struck on the I Ching.

He was already using his *Magic Square*³⁷(see figure 2.17) as a compositional tool, "in works like the *Sixteen Dances* and the *Concerto for Prepared Piano and Chamber Orchestra* [both 1950-51]", but he saw that I Ching's sixty-four hexagrams were better than Magic Square. After that he started to use I Ching in his works like the *Music of Changes* and *Music for Piano* (Johnson, 2011, p.23).

4	9	2
3	5	7
8	1	6

Figure 2.17 : An example of a Magic Square (Burkle, 2015).

³⁷ Magic Square: "It is a numerical acrostic, an arrangement of numbers in the form of a square, which, when added a vertical and horizontal rows and along the diagonals, yield the same sum" (Bragdon, 2005, p. 47). In music, it is used by Pierre Boulez and John Cage, as a precompositional tool, putting sounds in the square, instead of numbers.

During the late 1960's, Cage made his first experiments with I Ching, basically by throwing coins. In 1980s, his assistant Andrew Culver developed a computer programme called IC (I Ching) "to speed up the generating process" (Jaeger, 2013, p.4).

2.3.6 Decision on the benefitting from the I Ching and chance operations

As learning silence in the study of Zen, Cage, using the chance operations and the I Ching in his works, could learn who he was and how he understood it. He had confidence in the I Ching and he thought this oldest book had a value system.

In 1950, when Christian Wolff gave Cage the Richard Wilhelm's Chinese classic I Ching as a contribution to his work, he knew that, the I Ching "might interest and even influence Cage, partly because he knew his teacher's interest in Jung, who wrote the preface to this edition" (Hicks and Asplund, 2012, p.17). If Cage had not already heard Suzuki's lecture on ego, the I Ching would not have excited him so much. Cage mentioned the Suzuki's explanations on ego and its influence on him as follows:

The first was that I had heard a lecture by Daisetz Suzuki, with whom I was studying the philosophy of Zen Buddhism, on the structure of the Mind. He had gone to the blackboard and had drawn an oval shape. Halfway up the left-hand side he put two parallel lines. He said the top of the oval was the world of relativity, the bottom was the Absolute, what Eckhart called the Ground. The two parallel lines were the ego or mind (with a little m). The whole drawing was the structure of the Mind. He then said that the ego had the capacity to cut itself off from its experiences whether they come from the world of relativity through the sense perceptions or from its likes and dislikes, taste and memory, and flow with Mind with a capital M. Suzuki said that this letter choice was that Zen wanted. I then decided not go give up the writing of music and discipline my ego by sitting cross-legged but to find a means of writing music as strict with respect to my ego as sitting cross-legged. (Kostelanetz, 1993, p.177)

After Cage had heard this speech, he understood that all things are related to each other and he began to strive for purifying himself from the ego. His claim was remove "his own ego, his own likes and dislikes from the music". In his music and his mesostics as well, his aim was to "soften the brutality of the ego, to silence or deflate its claims to total conceptual and political control" (Perloff and Junkerman, 1994, p. 202). According to Cage, chance operations helps to "freeing the ego from its taste and memory, its concern for profit and power, of silencing the ego so that the

rest of the world has a chance to enter into the ego's own experience whether that be outside or inside" (Herwitz, 1993, p.167). "Cage was concerned to remove personal taste from the process of composition" (Cull, 2013, p.49). He thought that the chance operations allowed decisions which has the effect of opening him to the possibilities he did not considered. With the "chance-determined answers", Cage would "open the mind to the world around" (Fetterman, 1996, p. 41).

Since the chance operations "effectively blocks the exercise of one's accumulated knowledge and prejudices", it is particularly effective to Cage. Because he thought that, "any useful compositional method or technique should serve as a means of emptying the mind of thoughts that would exclude possibilities" (Pritchett, 1996, p.76). From 1939, Cage had written music using rhythmic/durational structures "based on the square root". By the early 1950s, he was "already filling his durational structures with materials that were arrived at via decontrolled process" such as the magic squares of the Concerto for Prepared Piano and the charts of the I Ching-based pieces. The first "implication of the chance-determined procedure" was the durational structuring. In this system the duration was no longer necessary; and second, "that conventional notational practices could be sidestepped", in their place "a variety of unconventional practices" would be substituted (Johnson, 2011, p.46).

Cage wrote his chance-created pieces by "making choices to asking questions. The questions were answered by means of the I Ching chance operations". Following his studies with Suzuki on Zen Buddhism, he used the I Ching in all his work, "whether literary, graphic or musical" (Larson, 2012, p.180). He used the I Ching to determine "such compositional factors as the number and duration of sounds in a musical composition, or the choice and placement of words in writing" (Jaeger, 2013, p. 4).

At first, he derived from the I Ching's "basic attitudes toward the world and toward questions and answers". But also he adapted "the coin method of consulting it to musical composition" and then, to write lectures and poems. He primarily meant "ones involving unequal probabilities" by chance operations. He considered that these probabilities were hidden in the "ritualistic methods through which the I Ching consulted" (Bernstein and Hatch, 2000, p.213). Cage indicates "the acceptance of nature. He views the composition as an act of acceptance of any sound regardless of its results. For Cage, there is no split between art and life. The purpose of composing is an "affirmation of life" (Steib, 2013, p.17). His own experience proved to him that

all he need was listen to the sounds around him, because they were changing. In his works, Cage was trying to say the effect of the change, and I Ching confirmed his ideas on changing of everything (Cage and Charles, 1981). He influenced by “such Oriental notions as creation, preservation, destruction and quiescence”, and by the “Indian notions of the emotions” such as tranquility”. Then he began to compose in that way. He made moves on the “spirit of acceptance, rather than a spirit of control” (Kostelanetz, 2003, p.17). In this manner, Cage always accepted everything the I Ching exposed to him. The first thing the I Ching teaches us is acceptance. If we want to ask questions to it, then we must accept the results. Cage described it as follows:

We have no right to use it if we are determined to criticize the results and to seek a better answer. In fact, the I Ching promises a completely sad lot to anyone who insists on getting a good answer. If I am unhappy after a chance operation, if the result does not satisfy me, by accepting it I at least have the chance to modify myself, to change myself. But if I insist on changing the I Ching, then it changes rather than I, and I have gained nothing, accomplished nothing! (Larson, 2012, p.182)

Cage described that he used the I Ching because it was useful. He used it not only in music, but also for the issues in his life. He generally was asking to the book when he was in trouble or had a problem. When he asked the question; he was trying to see if “some bells ring or not” in his mind (Smith, 2012, p.206).

Cage’s close friends made important comments on his usage of the I Ching. For instance, according to Cunningham, Cage used the I Ching as a way “to jump to the next possibility as he sees it. He’s constantly looking for something he doesn’t know about rather than reinforcing something he does, which could automatically put him in a position with the public” (Dickinson, 2006, p.63). Nevertheless, Bonnie Bird thought that Cage did not think of things “in a developmental fashion”. He always did something new and unexpected associations of things, based on the I Ching and the chance operations (Dickinson, 2006, p.78).

Bernstein and Hatch (2000), summarize the reasons of Cage’s usage of the I Ching as follows:

Cage used the formulation “I Ching chance operations” to describe his method of putting into operation the Eckhart-Jung paradigm, as though the I Ching were the source of chance alone. The I Ching was for Cage far more than a quaint and antique source of random numbers, as it is so often characterized. It was the way of seasoning and sobering the mind, bringing Eckhart’s ignorance in

touch with *Grund*, Jung's conscious in touch with the unconscious, and finally Suzuki's small-m mind in touch with Mind. (p. 87)

2.4 Significant Names Interested in the I Ching

The ancient book I Ching, which has common roots with Chinese philosophy, has influenced many major branches. These influences are seen not only in the Chinese and Japanese culture, but also in the Western culture. In the Chinese culture, I Ching influenced Confucianism, *Taosim*³⁸ and *Chinese Buddhism*³⁹; nevertheless, in Japan, the influences are realized on the *Tokugawa* thought and culture⁴⁰. In Europe and America, intellectuals such as authors, poets, physicists, psychologists, philosophers, novelists, writers, film makers composers and musicians received their share of the I Ching.

Author Douglas Adam's book *The Long Dark Tea-Time of the Soul* (1988), features an I Ching pocket calculator. Another author Philip K. Dick used the I Ching as a theme in his book *The Man in the High Castle* (1962), and he said that he wrote his book with the help of the I Ching (Campbell, 2011). In Hermann Hesse's great last novel *The Glass Bead Game* (1943), I Ching runs as a main concern. Hesse found liberation, enlightenment, resonance, and the sense of freedom in the I Ching (Minford, 2014). British author Philip Pullman used the I Ching in his book *The Amber Spyglass* (2000), and mentioned about using the yarrow-stick casting methods and the ying-yang (Quellette, 2010). Francophone author Ezechiel Saad, developed his own insightful approach to I Ching. He wrote his books *Yi-king, mythe et historie* (1989), *Hasard et Intuition, Spiritualité, Yi-king et science* (1991), and *La escritura china, y la epopeya de lo pragmático* (2011) in Barcelona (Url-3). Author Neal Stephenson, in his novels *The Diamond Age* (1995), *Cryptonomicon* (1999),

³⁸ Taoism: Ancient Chinese tradition of philosophy, religious and ethic. The specific revealer of Taosim was Lao Tzu (634-531 B.C). Taoism is the "philosophy of the rhythm of life and the simplicity of mind and spirit. It emphasizes "the presence of spontaneity, balance and harmony" (Cooper, 2010, p. 1).

³⁹ Buddhism: Nontheistic religious tradition with the leadership of Siddharta Gautama, known as Buddha, who was born (near the end of the sixth century BCE) in India. Buddhism teaches the notions as re-birth, meditation and Karma (car-ma) which means the cycle of cause and effect (Eckel, 2010).

⁴⁰ Tokugawa: "The Tokugawa was one of the most important periods in Japanese culture". In this period the artistic and cultural forms "reached their maturity and the peak of their popularity" in the forms of drama, music, poetry, painting and the porcelain (Ng, 2000, p. 188).

Quicksilver (2003) and *Confusion* (2004), used the hexagrams and mentioned about the I Ching.

British poet Alan Baker's *The Book of Random Access* (2011) has 64 sections. Each of the 64 prose poems is 256 words long. As Baker explains, 64 is the number of hexagrams in the *I Ching*, and both 64 and 256 are significant numbers in computing (Seed, 2011). Like Cage, British poet Allen Ginsberg "had studied Eastern philosophy, going so far as to throw I Ching coins one day in 1953 to divine the next stop on a cross-country journey, which led him to San Francisco". In Buddhism, he found "a moment of philosophical peace in a whirl-wind of existence that frightened and stimulated him" (Scott and Rutkoff, 1999, p.317). He wrote a poem called *Consulting I Ching Smoking Pot Listening to the Fugs Sing Blak* (1966). The philosopher and novelist Will Buckingham had been increasingly preoccupied by the strangest Chinese Book of Changes and visited China. He mentioned about the I Ching in his web page as follows:

I knew the arguments against the I Ching: divination doesn't work, it belongs to the realm of prescientific superstition, it is a primitive attempt to tame the uncertainty of the future. I had heard these arguments many times, and they made sense to me; and yet there was something about the I Ching that continued to fascinate me, something that –the more I studied it– could not allow me to dismiss this book so lightly. (Buckingham, 2013)

In his first novel, he wanted to work on something new and substantial. In a conversation with his friend, he found himself talking about the astrology, tarot cards and other forms of prognostication. A few days later, he went to the bookshop and picked up a copy of the I Ching, the book of changes. In due course he started getting to know the I Ching better. In 2010, he travelled again to China to get the bottom of things. He discussed divination practices with philosophers. He describes the I Ching as an uncertainty machine (Buckingham, 2013). "In Europe, the influential French novelist and poet Raymond Queneau (1903-76) had a longstanding and intense interest in the *Yijing*" (initially sparked by Philastre's translation and later reignited by Wilhelm's)" (Smith, 2012, p. 200). Like in the Book of Changes, "which contains 4.096 possible oracular texts", in Queneau's *Cent mille milliards de poèmes* (One Hundred Trillion Poems) "contains of then sonnets printed on ten separate pages that are then cut into fourteen separate strips of paper, each one containing a single line of the sonnet, producing ten possible poems" (Glover and McCracken, 2012, p.201).

American Broadcasting Company (ABC), had a soap opera called *Dark Shadows*. Its writers “moved the characters around in different time lines, sending them into the past and the future. Time travel was accomplished by magical rituals with I Ching wands, or a mysterious staircase in the mansion” (Guiley, 2005, p.97). In this soap opera, the characters allowed to meditate on the hexagrams of the I Ching, to astral travel.

American singer-songwriter Bob Dylan, in an interview in 1965, extolled the I Ching as ‘amazingly true’ and ‘the biggest thing of all’ (Bell, 2014). In the lyrics of his song called *Idiot Wind*, there is a sentence as “I threw the I Ching yesterday, it said there’d be some thunder at the well” (Dylan, 2014, p.504). Syd Barret, English musician, composer, singer, and the creator of the English rock band *Pink Floyd* also was affected by the I Ching. He said that his song *Chapter 24* was from the I Ching; “there was someone around who was very into that, and most of the words came straight of that”. He added “it didn’t mean much to me at the time. Then three or four months later it came to mean a lot” (Palacios, 2010, p.111).

2.4.1 Merce Cunningham

American dancer and choreographer Merce Cunningham was John Cage’s longtime partner and collaborator. Merce was born on April 16, 1919 in Centralia, Washington. Here he studied dance with Maude Barret and from her he learned tap dance and soft shoe, exhibition ballroom, and ethnic styles (Morgenroth, 2004). In 1936 he graduated from high school and went to George Washington University, D.C., then he attended the Cornish School, in 1937, where he met John Cage.

In 1939, Merce “went to the Bennington Summer School for Dance held at Mills College” and here he met Martha Graham. She was immediately impressed of him “and as a result Cunningham left the Cornish School and joined her company in New York” (Dickinson, 2006, p. 52). Cunningham worked in Martha Graham’s company as a soloist, between 1939-1945. *El Penitente* 1939, and *Appalachian Spring* 1944, are the works which Merce performed with this company. At the same year, he presented his first programme of solo works.

Over the years, Cunningham developed his choreographic process and technique. He used to work on his choreographies separate from the music. The two elements, music and dance were combined only at the final rehearsals. He “cautioned that the

dance ‘didn’t necessarily fit the music’ and he choreographs “segments of motion” that “never seem to carry over the bar lines for more than a few measures and that have no climaxes or formal progression” (Siegel, 1985, p.326).

“He worked extensively with John Cage, especially in ventures at Black Mountain College. In 1953, he formed the Merce Cunningham Dance Company for whom he has choreographed ever since” (Brayshaw and Witts, 2014, p.155). “In 1954, Cunningham’s dance company gave its first New York performance”. In 1964, he and his company “began a world tour, and from 1965 to 1968, the company performed many times, both abroad and in the United States” (Lawlor, 2005, p.76). He exerted a great influence on postmodern dance, with his dancing, teaching, and association with John Cage. Dance historian Sally Banes thought that Cunningham “offered a fresh approach to dance in his own works” (Schechner, 2010, p.245). He wrote about Cunningham’s innovations in dance, as follows:

Beginning in 1944, he gave dance concerts that departed radically from the by then traditional modern dance. His innovations in dance paralleled those of his friend and colleague John Cage in music. Essentially, he made the following claims: 1) any movement can be material for a dance; 2) any procedure can be a valid compositional method; 3) any part or parts of the body can be used (subject to nature’s limitations); 4) music, costume, decor, lighting and dancing have their own separate logics and identities; 5) any dancer in the company might be a soloist; 6) any space might be danced in, 7) dancing can be about anything, but is fundamentally and primarily about the human body and its movements, beginning with walking. (Schechner, 2010, p.245)

Since December 1989, Merce Cunningham, to make new dances, has been using the computer choreographic software LikeForms. This programme was installed in his Westbeth studio in New York (Vaughan, 1997). Copeland (2004), wrote about Cunningham’s choreography on computer software LikeForms, as follows:

Cunningham began to employ unprecedentedly complex counterrhythms for the arms and legs. It’s probably no coincidence that “Polarity” was one of the first dances Cunningham choreographed after he began his experiments with LifeForms. Typically, he used the computer to devise movements for the legs, arms, and torso that were totally autonomous of one another. Cunningham’s long-standing tendency to conceive of the body as an assemblage of separate parts is facilitated immeasurably by the computer which obeys no innately “organic” preferences. In the choreography devised with the assistance of LifeForms, it’s not common for the dancers to move stage left in a series of successive hop-turns on one leg when their heads circle in the opposite direction. (p. 173)

In 2005, in an interview with L.A Times, he said that “The computer allows you to make phrases of movements, and then you can look at them and repeat them, over

and over, in a way that you can't ask the dancers to do because they get tired" (Segal, 2009). Merce Cunningham continued to lead the Merce Cunningham Dance Company until his death, in April 2009, New York City. The Company was closed at the end of 2011. "Now recognized as a seminal figure in twentieth-century American culture, Merce Cunningham received numerous prestigious awards and honors, including the National Medal of Arts and membership in the American Academy and the Institute of Arts and Letters" (Summers, 2004, p.69).

2.4.2 Merce Cunningham and his chance operations

"While many postmodern choreographers were influenced by jazz principles of improvisation", Merce Cunningham had a "tremendous interest in Chinese, Japanese and Indian philosophies that emphasized the physical properties of objects and cultivated an awareness of the concentration necessary to engage fully in unanticipated acts" (Goldman, 2010, p.58). "Cunningham's exploration of the use of chance procedures in the creative process and the dissociation of dance from music in order to focus on pure movement set the stage for postmodern dance" (Naughtin, 2014, p.45). "Under the influence of his chief musical collaborator, John Cage, Cunningham has introduced the dance world to utterly iconoclastic ideas about the role that 'chance operations' can play in the choreographic process" (Copeland, 2004, p.6).

Merce Cunningham has used the "chance procedures and the philosophy of the I Ching" for the dance, since the early 1950s (Vaughan, 1997, p.72). "He first began using chance operations in his choreography in 1951 for 16 Dances for Soloist and Company of Three. Chance subsequently became a central part of his making processes" (Brayshaw and Witts, 2014, p.155). He used it to develop material. He "would flip coins or roll dice to determine when and where dancers would enter and exit the stage or to designate the length of phrases" (Goldman, 2010, p.58).

In an interview, when Peter Dickinson asked Merce Cunningham about the chance operations, he answered as follows:

I have used chance operations ever since the early fifties when the idea came along and I began to understand something about it, working at in various ways. Each piece has some element of chance operations, maybe simple or complex. What I always have to go on is the fact that I am dealing with human beings. There is no question of their running onto each other –to put it on the simplest level–

which could involve serious accidents or injuries. From that point of view, I involved myself with the practical aspects of dancing. At the same time, I used the chance operations to make the continuity of the dance. It has nothing to do with the dancers performing. There is no improvisation or anything like that. The dances have been strictly choreographed, but the process of choreography is by using chance. (Dickinson, 2006, p. 58-59)

On a program Merce Cunningham discussed the use of the I Ching in choreography. “He explained that a dancer has two arms, two hands, and two feet, and so on. You have to decide where these go and how they change” (Diaconis and Graham, 2012, p.123). He added he frequently used the I Ching to prompt these decisions, and allowed them while “Cage took the output of the I Ching very seriously and stuck to its choices”. He said “I allow myself more fluidity. It’s a suggestion. If it doesn’t fit, I don’t use it” (Diaconis and Graham, 2012, p.123). He explained that he used the I Ching in several dances to devise what comes after or what could be the new experience (Dickinson, 2006).

According to Susan Foster, Cage and Cunningham were profoundly interested in Zen philosophy. Foster mentioned about their usage of the Zen philosophy as follows:

Both artists used Zen as inspiration to concentrate attention on the physical and sonic facts of performance. Rather than implement dance movement and musical sound to convey and underlying message or transcendental property such as beauty, they opened up their respective mediums to a nearly concrete participation in art making and viewing. (Goldman, 2010, p.58)

For Cunningham, the use of the I Ching “to select elements in a predetermined gamut of movements, body parts, or stage spaces” made him develop “a technical style characterized by unexpected juxtapositions of actions” (Banes, 1994, p.103).

2.4.3 Andrew Culver

Canadian composer and technophile Andrew Culver was born on 30 August, 1953. He makes chamber and orchestral music, electronic and computer music, sound and music sculpture, film, lighting, text pieces and installations. He performs concerts on sound sources of his own invention. He develops databases and software to realize his work, and to make chance operations accessible to others (Culver, 2007). Andrew Culver is the composer of the largest work *Ocean 1-133*, which “promotes ‘tensegrity’ the structural principle famously coined by the ecological thinker R. Buckminster Fuller” (Edmondson, 2013, p.413).

“He first met Cage, when he was twentieth-five, a graduate student in composition at McGill University”. He wanted to work with Cage, but Cage did not need anybody. “Meanwhile, he developed ‘a fixation’ on the ideas of Buckminster Fuller⁴¹, even constructing a resonant performance sound source based on Fullerian principles of tensegrity (Silverman, 2012, p.355). Around 1983-84, Cage bought a new computer IBM PC and employed Andrew Culver as a programmer and assistant. Culver worked with John Cage from 1981 to 1992. “He developed computer programs for Cage’s music and poetry and directed his theatrical installation pieces” (Bernstein and Hatch, 2000, p. 300). “He filled this important role for many years, making Cage’s ideas happen on the computer” (Bernstein and Hatch, 2000, p. 190).

2.4.4 Andrew Culver and IC (I Ching)

Andrew Culver “created generalized computer algorithms for Cage’s procedures that could be applied to any of his projects. Cage relied on Culver’s software for the rest of his life” (Dean, 2009, p.112). In the early 1980s, Culver created a program, which “simulates the I Ching coin oracle and relates the numbers one to sixty-four to any other numbers” (Lehman, 1996, p.25). The computer programme called *IC* (I Ching), developed by Culver “to speed up the generating process (Jaeger, 2013, p. 4). Peter Jaeger (2013), in his book mentioned about his experience with the IC as follows:

Following Cage’s use of digital I Ching software, I employed an online random-integer generator to organize this book’s layout. I first programmed the online generator to produce a random sequence of numbers running from one to sixty-four (the number of possible combinations or hexagrams used in the oracle). Next I divided the text into shorts units by counting out the exact numbers of words for each unit – the number of words per unit being derived from the number generated by the random series. I then programmed another series of numbers between one and six (I Ching coins are thrown six times in all, giving a hexagram of six lines). These numbers determined the number of spaces between each unit of text. Hence, the number of words per unit of text, as well as the number of spaces between each unit, has been determined by chance operations, limited by the structure of the I Ching’s numerological constraints. The resulting text is subject to odd interruptions, offbeat lacunae of silence, each of which has been dictated by a no- subjective agency. (p.4-5)

⁴¹ Buckminster Fuller: Richard Buckminster Fuller, (July 12, 1895- July1, 1983). He was an American architect, an outstanding creative thinker and designer whose inventive technological expressions were attempts to make life easier and more comfortable for people while still maintaining a close relationship with nature (Potter, 1990).

“This approach ‘revolutionized’ Cage’s working practices, because all he had to do was refer on the computer print out to the hexagram, use that hexagram as numerical data for determining compositional form, and then to cross out the data and move on to the next hexagram” (Nicholls, 2002, p.90). John Cage, in his book *Anarchy* (1998) utilized from the IC. He mentioned about the computer programme as follows:

Which is the thirty quotations together with the fourteen names (authors, book titles, graffiti) was to be used as the string upon which is mesostic was written was also determined by IC. Where, through the use of chance operations, duplicatin of strings resulted, the mesostics having the same string became a single renga, a single poem composed for a plurality of poems. A renga in the text itself is indicated by an asterisk following the mesostic number. A program made by Andrew Culver, extended the number of characters in a search string for MESOLIST (a program by Jim Rosenberg) to any length; this extended MESOLIST was used to list the available words which were then subjected to IC. The resultant mesostics are therefore global with respect to their sources, coming as they do from anywhere in them. (p. vi)

With this programme, the mechanics of Cage’s works were much simplified. He could run a new simulation of the I Ching, to replace that of Ed Korbin, and a program by Jim Rosenberg (Revill, 2014).

2.4.5 Christian Wolff

Christian Wolff is an American experimentalist composer. He was born on March 8, 1934 in Nice, France and migrated to the United States in 1941. “He grew up in an artistic and cultured family environment where classical music was an important part of daily life” (Sitsky, 2002, p.561). “Wolff’s father Kurt was a celebrated German publisher who had promoted Kafka and Expressionist writers such as Trakl and Heym. He was also a cellist whose father was a music professor with ties to Brahms’s circle” (Chase and Thomas, 2010, p.7). “His mother, Helen, was a noted intellectual and hostess. Both parents kept a stash of records they played frequently” (Larson, 2012, p.176).

Even his family saturated with the classical music, Christian hated modern music. However, this changed when he began composing at the age of about fourteen. Someone gave him a book on orchestration; he got interested and started on his own

without any formal instruction. He heard a concert of the Julliard Quartet perform the music of Schoenberg, Berg and Webern and he liked it a lot (Wolff, 1999). In 1949, Christian began piano lessons with Grete Sultan⁴², and at each lesson, he showed Sultan the imitated brief pieces from Schoenberg and Bartók. “In March 1950 Wolff made an appointment to see Cage” (Hicks and Asplund, 2012, p.9). After he left home, “Cage wrote enthusiastically to his friend Pierre Boulez: ‘I have a wonderful pupil. He is sixteen and his favorite composer is Webern. He has great intelligence and sensitivity. What’s more, he was born in France. His name is Christian Wolff’” (Hicks and Asplund, 2012, p. 10).

2.4.6 Christian Wolff and his use of the I Ching

Cage gave him lessons free of charge and Wolff in exchange for his compositions lessons, brought Cage “a copy of his father’s publication of the *Yi Jing* (I Ching), Chinese Book of Changes, which used in his work thereafter as a source of ‘chance operations’ to obtain numerical values” (Marter, 2011, p.386). According to Schlegel (2008), Cage’s use of “chance procedures and attempts to remove the ego from composition have not developed into a compositional language among young composers”. On the other hand, he pioneered the composers such as “the use of graphic notation” and perhaps “the use of the I Ching”. Schlegel wrote that, Cage gave Christian Wolff permission to do his work and he did not need to use the I Ching (p.22).

Nevertheless, Chase and Thomas (2010), mentioned about Wolff’s using the I Ching method in his work *For Piano I*, as follows:

For Piano I uses a total of nine pitches resulting in a wide array of possible combinations. Wolff also preordains a collection of dynamics (nine in total, not assigned a particular pitches as was the case in *For Prepared Piano*) and durations. In earlier works, Wolff set up a rhythmic structure to act

⁴² Grete Sultan: She was a German-American, Jewish concert pianist. Born on June 21, 1906 in Berlin, and died on June 26, 2005 in New York City. “Raised in a musical family, Grete’s concert career was interrupted by the Nazi rise to power in the 1930s”. She and her family “was forced to flee to the United States in 1941”. She began teaching music after her arrival to the United States (Lentz, 2006, p. 358).

as the scaffold for the content. However, in this work, he devised a set of 16 durational blocks, each containing a certain number of sounds (i.e. having a particular density two of which were ‘zero density’, or silence), and he then used chance processes (borrowing Cage’s mechanism for chance, the *I Ching*) to determine the juxtapositions and superimpositions of durational blocks. (p. 57)

2.4.7 Lou Harrison

Lou Silver Harrison was an American composer. He was born on May 14, 1917 and died on February 2, 2003. “Harrison spent most of his creative life bringing things together; diverse art forms, contrasting musical styles, and instruments or compositional processes from different cultures” (Miller and Liebermann, 2006, p.1). “His quest for new musical sounds let him to create the American Gamelan. Patterned after the Javanese gamelans (an Indonesian ensemble of matched metallophones and drums), Harrison built his own instruments and composed numerous pieces specifically for the ensembles he constructed” (Stacey and Henderson, 2013, p.278). Lou Harrison interested in “object theater and the puppet-music performances inspired by Asian models that are characteristic of West Coast America since the 1970s” (Dircks, 2004, p.189).

Lou Harrison studied counterpoint and composition with Henry Cowell. He also was the student of Arnold Schoenberg, at UCLA. “Twelve-note serialism dominated his compositional style throughout the 1940s” (Stacey and Henderson, 2013, p.278). Harrison “used various serial approaches, involving very lyrical tone rows with tonal implications or with fewer than twelve tones, as well as permutation principles. This approach found expression in such compositions as *Schoenbergiana* (1945), *Symphony on G* (1948-65), and *Rapunzel* (1954)” (Feisst, 2011, p.242).

The member of the American Academy Lou Harrison was also a “music critic of the *New York Herald Tribune*”(Smith, 2010, p. 54). “He also played a major role in bringing the work of Charles Ives⁴³ to the attention of the musical world. He conducted of the premier Ives’s *Symphony No.3*, the work for which Ives won the Pulitzer Price for Music in 1947” (Edmondson, 2013, p.1026).

⁴³ Charles Ives: (1874-1954). He was one of the first American composers “to earn international acclaim for his music. He is known primarily in the “minimalist style”. His music is known for its polytonality, polyrhythm, dissonance, imagery, and effects” (Edmondson, 2013, p. 589).

The choreographer Mark Morris, who made dances with many of Harrison's pieces, says, "He was a giant star among many different people—the Esperantists, the homosexuals, the gamelan enthusiasts, and the sign-language speaker. He did so many odd and important things, it just affects everybody" (Dalton, 2003, p.61).

2.4.7.1 Lou Harrison and the I Ching

Although it is not clear how often and in which works he used the I Ching, it is known that the Book of Changes was introduced to Cage by Lou Harrison. Lou Harrison drew his attention to a copy in the San Francisco Public Library, circa 1936. In 1971, in an interview, he said that he used the I Ching, in a way that he did not specify, in the process of the composing music. When he was in Los Angeles, he told Cage that he had begun to practice on a work in which he used the I Ching, in a number of determinative ways (Revill, 2014).

2.4.8 Jackson Mac Low

Jackson Mac Low (born Chicago, 12 September 1922; died New York, 8 December 2004) "made poems, essays, and musical performance, visual and radio works. Author of about 30 books and published in over 90 collections, his works have been published, exhibited and performed in many countries" (Mac Low, 2008, p.451). Mac Low studied at the University of Chicago and graduated in 1941. In 1943, he took courses of philosophy and literature. In the late 1950s and early 1960s; Mac Low wrote and produced two important plays, notable in the history of Fluxus art and literature. These works are *The Marrying Maiden* and *Verdurous Sanguinaria*. The Marrying Maiden's music composed by John Cage. (Mac Low, 2000).

In 1963, Young⁴⁴ and Mac Low "published *An Anthology of Chance Operations*, a collection of writings artwork and musical scores that would lay the foundation for Fluxus, an association of experimental artists from a variety of media that gained traction in the 1960s" (Belletto, 2012, p.30).

⁴⁴ La Monte Young: Born October 14, 1935. He is an avant-garde American artist, composer and musician. His "unique musical aesthetic combining aspects of serialism, Cagian conceptualism, Eastern philosophy and an obsession with the idea of a perpetual sound world has been one of the major forces, in the development of minimalist music" (Sitsky, 2002, p. 246).

2.4.9 Jackson Mac Low and his chance operations

After Marcel Duchamp and John Cage, Jackson Mac Low used the chance operations in his works. His compositions were heavily influenced by John Cage. He used chance operations in his poetry, as a composition technique (Diggory, 2013). He “insists that an artist’s use of philosophy is serious even if it occurs through misreadings and conflicting lines of thought. Thus the influence of Asian philosophy—particularly Zen but also the I Ching—can make sense of concepts of synchronicity in C.G.Jung” (Hejinian and Watten, 2013, p.119).

“In 1954, I began working in a different way than I had previously, under the influence of Taoism & Buddhism, especially Zen Buddhism, together with ideas implicit, some explicit, in the I Ching (Book of Changes) remarks Mac Low” (Haralson, 2001, p.432).

Jerome Rothenberg wrote about Mac Low’s use of the chance operations in the poetry, as follows:

Mac Low stands with John Cage as one of two major artists bringing systematic chance operations into our poetic and musical practice since the Second World War. The resulting work raises fundamental questions about the nature of poetry and the function of the poet as creator. For raising such and other questions, Mac Low like Cage has sometimes met with strong rejection and ... has found less public recognition for work that’s often sensed as “abstract” and that seems, by setting “chance” over “choice” in the making of poems, to act against the projection of personality usually associated with “the poet”. Still he is widely influential and recognized by many (Cage among them) as the principal experimental poet of this time. (Dickinson, 2006, p. 94)

Marrying Maiden’s “structure is based on a combination of authorial choice (Mac Low chose the text—the I Ching and a list of 500 adverbs indicating the manner of speaking fragments from it) and chance” such as the order, duration, tempo and volume (Sandford, 1995, p.242). Brill (2010), mentioned about Mac Low’s Marrying Maiden and his use of the I Ching, as follows:

Jackson Mac Low had been interested in chance operations since the late 1950s. In Cage’s *Music for Changes* from 1951, the decision about which notes were played and when they should sound was determined by consulting the *I Ching—Book of Changes*, which had only translated into English the previous year. It was a proceeding Paik used for several of his compositions, and it was resumed by Jackson Mac Low in the *Marrying Maiden* from 1958, where words and phrases were taken from the I Ching, chosen by systematic chance operations, and were accompanied by a score by Cage, the use of which was determined by the throwing of dice. (p. 109)

3. INDETERMINACY AND PREPARED PIANO

3.1 What Is Indeterminacy?

The word *Indeterminacy* refers to *uncertainty* or *unpredictability*, in mathematical, scientific and philosophic meanings. Nevertheless, indeterminacy can be involved in all performances such as music, scripts, scores, dance, choreography, and theater. The visual and spatial arts, such as painting, sculpture, installation, photography, film and video are also can be counted as indeterminate. Indeterminacy generates always in the performance. “Each performance is always different because the parts are always played differently” (Danvers, 2006, p. 320).

Indeterminacy in music, began in the early 20th century in the music of Charles Ives and was continued in the 1930s by Henry Cowell. Then it has carried on by his student, the experimental music composer John Cage beginning in 1951. Indeterminacy came to refer to the (mostly American) movement, and this group grew up around Cage (Griffiths, 2010). In the indeterminate works, the composer “no longer determines what in traditional notation is a more or less precise relation between notational symbol and sound. The composer ‘undetermines’ the traditional process by which a performer reads a notation and produces sound successions determined by a composer” (Lochhead, 1994, p. 234).

According to Mayfield (2013), “the concept of sound mass, introduced earlier, can be considered an avant-garde technique that falls under the heading of indeterminacy. With indeterminate music, the composer gives up some degree of control over the outcome of the performance” (p. 560). Nevertheless, Winkler (2001), summarized that indeterminacy exists on several levels, based on the ability to predict the final outcome of a performance. However, it is usually a term denoting significant musical features that are not precisely fixed or determined in advance” (p. 29). Even the indeterminacy notation devised for indefiniteness in music, it is also called “chance” or “aleatoric” music. All music has some inherent elements of chance due to differences in the interpretation by various performers, the quality of instruments or voices involved, and the acoustical properties of the performing space” (Mabry,

2002, p. 61). However, in the twentieth-century music, indeterminacy has many meanings. Turek (1988), juxtaposed them as follows:

1. Indeterminacy may mean that *every element* of the music is subject to aleatoric procedures, or it may mean that *only one or two* musical elements are left to chance.
2. Indeterminacy may be *partial*(chance procedures characterizing only portions of the composition) or it may be *total* (the entire composition characterized by chance procedures).
3. Indeterminacy may be applied in the *compositional stage* or in the *performance stage*. In the compositional stage, the composer uses chance procedures to determine certain aspects of the music—the pitch content, the dynamic level, and so on. Once completed, however, the composition is performed the same way each time. In the performance stage, on the other hand, the composer provides one or more options. (p. 377)

In 1950s, artists, composers, choreographer and writers began to use indeterminacy in their works. Some of them are; John Cage, Morton Feldman, Cornelius Cardew, Merce Cunningham, Robert Rauschenberg, Hans Arp, Marcel Duchamp, Dove Bradshaw and B.S Johnson. They have all employed the indeterminacy to create the unpredictability in their works. The artworks were no longer expressing “the artist’s emotions, moods, or ideas”, but were doing something else. For example, “providing a space or opportunity for the audience or observer, who is considered as a passive receiver of the ‘message’ or ‘meaning’ of the artwork, to become an active participant in the process of making and interpreting” (Danvers, 2006, p. 321). Feldman’s *Piece for Four Pianos*, Brawn’s *December 1952*, Wolff’s *Duo for Pianists II* are the examples of the indeterminacy in the twentieth-century music. In these works, “the differences between performances are more than just subtle changes in interpretation of an idealized score, but rather are radical differences that extend even to the nature and order of events” (Pritchett, 1996, p. 107).

3.1.1 John Cage and indeterminacy

In the late 1950s, one of the composers who used the term *indeterminacy* was John Cage. In these years, Cage began to study on some innovations in his musical compositions. His development in the indeterminacy “could be explained in terms of his desire to use all sounds as musical material” (Katsushi, 2010, p. 43). Kostelanetz (2003) summarized that, when Cage started to interest in chance and indeterminacy, he rejected jazz and classical music, including Beethoven. “He never embraced spontaneity.” “It is at the point of spontaneity that the performer is most apt to have

recourse to his memory. He is not apt to make a discovery spontaneously” (Kostelanetz, 2003, p. 236).

He departed “from traditional music notation in favour of composing music with graphic scores, where space on the page might represent time or the frequency of sonic events”. Since the graphic score does not indicate neither “regular time signature” nor “conventional means to sound” (Jaeger, 2013, p. 25-26), the performer “cannot determine exactly what effect the notation causes” said Cage in 1960, thus, the indeterminacy emerged in his works (Muecke and Zach, 2007, p. 92).

His own description *object* and *process* emerged “after he adopted chance procedures” and began to discover the aspects of the indeterminacy, in the mid-fifties. The term *object* “referred to his earlier works, which were notated fully”, and “in the Western art music tradition”. The second category *process*, “were usually indeterminate and gave great interpretative license to the performer” (Bernstein and Hatch, 2000, p. 133). According to Cage, *chance* “refers to the use of some sort of random procedure in the act of composition”, however, *indeterminacy*, “refers to the ability of a piece to be performed in substantially different ways” – that the work allows the performer to play in a variety of unique ways (Pritchett, 1996, p. 108). He “seemed to share particular characteristics” in his development of indeterminacy. “Firstly, the use of silence is generally far more accentuated” in his work, and secondly, there is a greater tendency toward discontinuity” (Chase and Thomas, 2010, p. 148). Cage (1961) suggested that “when silence, generally speaking, is not in evidence, the will of the composer is” (p. 53). According to Jaeger (2013), Cage creates “a performative and indeterminate composition – a form of imprecise and unspecified compositional structure” (p. 25), which Simms (1986), named as “indeterminacy of performance” (p. 357). Even Cage makes it clear that the indeterminacy and the chance procedures are different stuffs, and “the *Music of Changes* is not an example” of the indeterminacy (Cage, 1961, p. 36), Pritchett (1996), emphasized that “his use of indeterminacy can be seen as emerging from his chance music” and the *Music of Changes* is a perfect product of the indeterminacy. Because in this work, Cage created a musical world with the “totality of possibilities” (p. 108).

Since Cage had studied on Buddhism for years, the indeterminacy can be searched also in the Buddhist philosophy. According to Thurman (1976), “indeterminacy of

meaning and performance brings to mind the Buddhist concept of *anupalabdhatva*, or incomprehensibility, a term which refers to the ordinary mind” (p. 161). “The illogic of Cage’s anecdotes and his performative textual gesture ensures that ordinary, conditioned thought patterns become inoperative, because indeterminacy calls into question the subject’s illusory sense of certainty about phenomena or about the self” (Jaeger, 2013, p. 29-30). Cage reminds us, “indeterminacy entails giving up personal intention and diminishing authorial control in favour of acknowledging a wider, less containable condition of experience” (Jaeger, 2013, p. 30). As he calls it, the aim of the indeterminacy “is to achieve greater objectivity and freedom of exploration by eliminating the artist’s personal values and tastes” (Turner, 1971, p. 7).

3.1.2 John Cage’s Lectures in Darmstadt (1958)

John Cage gave three lectures in Darmstadt in 1958, entitled *Changes*, *Indeterminacy* and *Communication*. Later he published these lectures as a three-parted section in the *Composition as Process*, in his book *Silence*. This lecture *Composition as Process* “is a manifesto from a radical period in Cage’s life, when he had dismissed the ideas and methods underlying earlier works such as numerical structures, considered improvisation, unambiguous notation and preconceived form” (Seibt, 2003, p. 101).

3.1.2.1 Changes

The first lecture *Changes*, “is a history of what Cage saw as the developments that had occurred in his work beginning with this percussion pieces and ending with those espousing indeterminacy” (Nicholls, 2002, p. 35). “Cage’s choice of title reveals his belief of the kinship between changes and chance”. *Changes* “is closely aligned with music” (Bock, 2008, p. 193), since it is Cage’s response to Dr. Wolfgang Steinecke’s request, the Director of the *Internationale Ferien Kurse für Neue Musik* at Darmstadt, to discuss *Music of Changes*. Cage presented the lecture at Darmstadt, Germany, site of the famous summer program for contemporary music. The lecture was a stop-and-go duet between Cage and the pianist David Tudor, performing *Music of Changes*” (Tick, 2008, p. 686). Cage (1961) explained his reason to write the *Changes*, as follows:

I decided to make a lecture within the time length of the *Music of Changes* (each line of the text whether speech or silence requiring one second for its performance), so that whenever I would stop speaking, the corresponding part of the *Music of Changes* itself would be played. The music is not superimposed on the speech but is heard only in the interruptions of the speech—which, like the lengths of the paragraphs themselves, were the result of chance operations. (p. 18)

In *Changes*, Cage (1961) wrote about the help of chance operations, and he explained his compositional process. To Cage, “it is an activity characterized by process and essentially purposeless” (p. 22). He even criticized himself by describing that his work *Music of Changes* (1951) was “inhuman than human” and “the performer, gives the work the alarming aspect of a Frankenstein monster” (p. 36). “Because this work had a fixed score and made the performer to transfer it mindlessly into sounds” (Katsushi, 2010, p. 43). In addition, *Music of Changes* induced Cage “to introduce the compositional dimension of indeterminacy with regard to performance, granting the performer a certain degree of creative freedom” (Feisst, 2009, p. 42).

3.1.2.2 Indeterminacy

In this lecture, Cage discussed five indeterminate and two “determinate but chance-composed” works. These five indeterminate works are Johann Sebastian Bach’s *The Art of Fugue*, Karlheinz Stockhausen’s *Klavierstück XI*, Morton Feldman’s *Intersection 3*, Earle Brown’s *Four Systems*, and Christian Wolff’s *Duo for Pianists II*. The other two works are, John Cage’s *Music of Changes*, and Earle Brown’s *Indices*.

In the Bach’s *The Art of Fugue*, Cage (1961) notes that “the timbre and amplitude characteristics” are not given, so that “are indeterminate”. “The function of performer”, in this case “is comparable to that of someone filling in color where outlines are given” (p. 35). Stockhausen’s *Klavierstück XI*, gives “the form aspects essentially conventional to European music” with its twelve tones and characteristic (p. 36). According to Pritchett (1996), the music of the *Klavierstück XI* “is presented in short fragments which are played in any order by the performer, thus making for a rudimentary kind of open form” (p. 108). Morton Feldman’s *Intersection 3*, the frequency and duration are determined, “but the specifics were not contained within the score, similarly certain aspects of the structure and form” of it were determined, “though the precise moment at which an event would happen remained indeterminate” (Iddon, 2013, p. 205). Earle Brown’s *Four Systems* “indicates relative

pitch and duration, but not specific notes” (Pritchett, 1996, p. 108). Cage “observed that to ensure indeterminacy with regards to its performance, a composition must be determinate of itself”, “each element of the notation must have a single interpretation rather than a plurality of interpretations” (Iddon, 2013, p. 206). Christian Wolff’s *Duo for Pianists II*, “exhibits open form in a more subtle fashion; here, the content of the musical events is indeterminate as well”. For instance, “the performers choose specific pitches from the collections given” (Pritchett, 1996, p. 108). Cage (1961) observed Wolff’s *Duo for Pianists II*, as follows:

In the case of *Duo II for Pianists*, structure, the division of the whole into parts is indeterminate. (No provision is given by the composer for ending the performance). Method, the note-to-note procedure, is also indeterminate. All the characteristics of the materials (frequency, amplitude, timbre, duration) are indeterminate within gamut limitations provided by the composer. The form, the morphology of the continuity, is unpredictable. One of the pianists begins the performance: the other, noticing a particular sound or silence which is one of a gamut of cues, responds with an action of his own determination from among given possibilities within a given time bracket. Following this beginning, each pianist responds to cues provided by the other, letting no silence fall between responses, though these responses themselves include silences” (p. 38).

Cage, in discussing his own *Music of Changes* and Earle Brown’s *Indices*, “shows that chance procedures can be used to create a work that is completely fixed from one performance to another – in other words, that chance can and has been used to produce essentially traditional scores” (Pritchett, 1996, p. 108). Cage cited Earle’s *Indices*” as an example of the whole history of Western orchestral music” (Brown, 2009, p. 224), in which the instrumentalists are “workmen, who simply do as they are bid” (Cage, 1961, p. 37).

3.1.2.3 Communication

Cage delivered his final lecture *Communication* on 9 September. This lecture was “the most controversial of the three” (Iddon, 2013, p. 210). It as a lecture that consisted of many questions and quotations, even if Cage said that he had nothing to say. During the lecture, David Tudor played *Four Piano with Preparations* by Christian Wolff, and together with Cage, his *Variations I*. In addition, he played Bo Nillson’s *Qualitäten* in the background while Cage was talking (White and Christensen, 2002). Bock (2008) summarized that *Communication* reflects his notion of and engagement with process”. “The other two parts of ‘Composition as

Process' do not have such a narrow focus as 'Changes', and they address the issue of 'Indeterminacy' and 'Communication' in a rather broad sense" (p. 193). This lecture is the most abstract one of these three-parted lectures. Actually in this lecture Cage criticizes Stockhausen, serialism and the European mentality on modern music. On the other hand, during the lecture, for each essay, it is handed out a translation for the German audiences. However, there was a confusion between the two languages German and English. For instance, Cage asks the following questions "Why don't they keep their mouths shut and their ears open? Are they stupid? And, if so, why don't they try to hide their stupidity?" (Cage, 1961, p. 49). In German, it is retranslated as *why don't you keep your mouths shut and your ears open? Are you stupid? And, if so, why don't you try to hide your stupidity?* Therefore, the German audience thought that Cage was addressing them directly. Christopher Schultis⁴⁵ figure out that Cage's anti-European stance created some negative reactions in Darmstadt (Haskins, 2004). Actually, the thing what Cage was trying to do was making us to feel the freedom. He communicated freedom to make us rethink and ask questions on music. He wanted us to know that the music is everywhere in this life, and there is not only the traditional models, but also the new materials.

3.1.3 John Cage, *Fontana Mix* (1958)

Cage composed *Fontana Mix* in 1958. The tape version of the work was premiered in Rome, on 5 January 1959. The ensemble type of the work is magnetic. Cage created "an indeterminate score to be used for a variety of compositions" with *Fontana Mix*. The piece "was scored for any number of tracks of magnetic tape, for any number of players, or any kind and number of instruments. Its duration was unspecified and the composition was indeterminate of its performance, meaning each realization of the work would be different" (Holmes, 2012, p. 108). "The score of *Fontana Mix* (see figure 3.1) was completed in November 1958. But the result of the work in Milan was not fully completed until February 1959, when Cage finished the two tape realization, which he most often used in performances" (Iddon, 2013, p. 98).

⁴⁵ Christopher Schultis: He is an American composer who teaches at the University of New Mexico. Schultis has books and essays on John Cage.

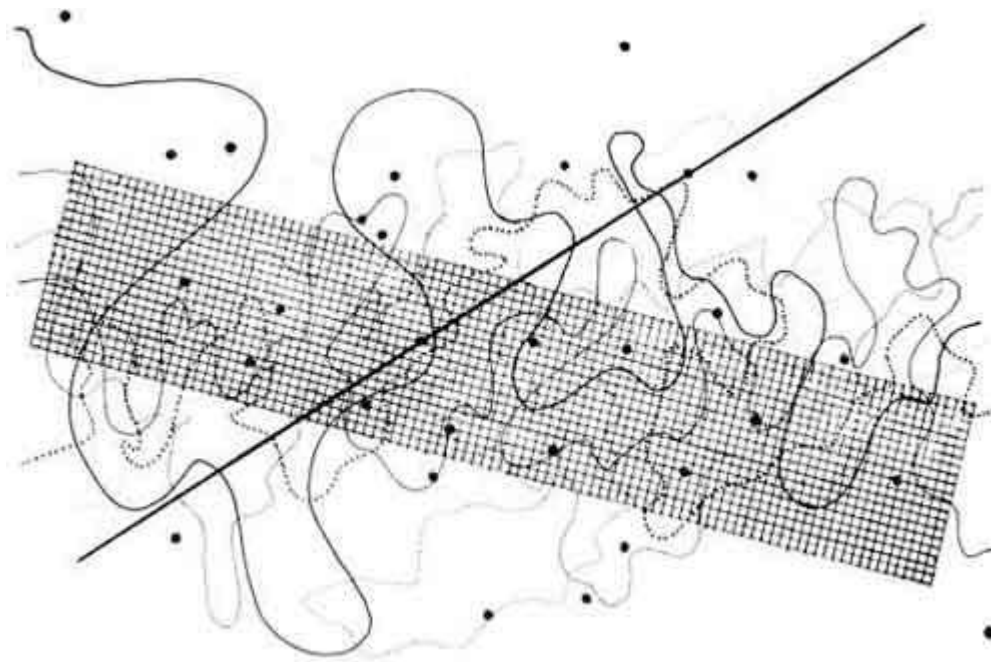


Figure 3.1 : John Cage, graphic notation for Fontana Mix (Cage, 1963).

The piece consists of “ten transparencies containing various numbers of dots, ten sheets of paper with curved lines of various thicknesses, one transparency of a two-by-ten-inch grid, and another of a straight line” (Díaz, 2015, p. 85). These unnumbered transparencies measure “eight-and-a-half by eleven inches, on which are randomly distributed points. The number of dots on the sheets are, respectively, 7, 12, 13, 17, 18, 19, 22, 26, 29, and 30” (Fetterman, 1996, p. 43). The other ten sheets of paper “had drawings of six curved lines differentiated by thickness and texture” (Holmes, 2012, p. 168). Cage gave some information about the transparencies of his Fontana Mix, as follows:

They are overlaying transparencies involving points and curvey lines which don’t cross over themselves. A given line doesn’t cross over itself but it goes in curving, meandering ways from one side of the oage to another. These curving lines are six in number and are differentiated by thickness (there are dotted) and you simply place them over the sheet with points—one sheet with points and one sheet with curved lines—and then a graph which is a hundred units in one direction and twenty in the other. There is a straight line used to connect a point that is outside the graph with one that is inside, and one measures the intersection of the curved lined with this straight line with reference to the graph vertically, to determine the kind of thing that would happen. (Sandford, 1995, p. 51)

Fontana Mix “was used to make a tape composition of the same title, as well as *Aria*⁴⁶(1958) for Mezzo-Soprano, *WBAI*⁴⁷(1960) for radio broadcast, and *Theatre Piece*⁴⁸(1960)” (Fetterman, 1996, p. 46). The piece may be performed with Cage’s *Concert for Piano and Orchestra*, *Solo for Voice 2*⁴⁹, and *Song Books*⁵⁰. For the *Water Walk*⁵¹, *Sounds of Venice*⁵², *Aria*, *Theatre Piece* and *WBAI* Cage used the same material of *Fontana Mix* (Kostelanetz, 1993). In February 1959, Luciano Berio invited Cage to work in Milan at the studio di Fonologia. Here Cage assembled *Fontana Mix*, using the transparency method (Shook, 2005). Marino Zuccheri⁵³ made his technical assistance and Cage determined the array and the manipulation of the sound-sources, and finally he finished the 2-tape version of the work. The title *Fontana Mix* comes from a landlady Signora Fontana, who met Cage in Milan (Revill, 2014).

3.1.4 John Cage, Cartridge Music (1960)

In 1960s, live electronic music became very important, because “groups appeared using both conventional and electronic instruments, sometimes including synthesizers, with means of amplifying and otherwise altering and increased availability of various kinds of synthesizer the genre came into its own” (Ammer, 2004, p. 218). Cage composed his *Cartridge Music* in 1960. It was “one of the earliest live-electronic works” (Smith, 2013, p. 289). It is a work “of electroacoustic music in which phono cartridges were used to amplify sounds that were otherwise

⁴⁶ *Aria* (1958): “The notation represents time horizontally, pitch vertically, roughly suggested rather than accurately described. The relation of time and space is free. The vocal lines are drawn in black, with or without parallel dotted lines, or in one or more of eight colors” (Kostelanetz, 1993, p. 58).

⁴⁷ *WBAI* (1960): “Is a score for the operation of machines. Durations are graphed” (Kostelanetz, 1993, p. 61).

⁴⁸ *Theater Piece* (1960): “Parts are provided for one to eight performers (musicians, dancers, singers *et al.*) to be used in whole or part, in any combination” (Kostelanetz, 1993, p. 61).

⁴⁹ *Solo for Voice 2* (1960): “Is a composition indeterminate of its performance. The singer prepares a program of desired time-length using the material provided” (Kostelanetz, 1993, p. 60).

⁵⁰ *Song Books Vol.1 and II* (1970): “Solos for voice. The solos may be used one or more singers. Any number of solos in any order and any superimpositions” (Kostelanetz, 1993, p. 96).

⁵¹ *Water Walk* (1959): It is a score “for solo television performance which involves a large number of properties and a special single-track tape, 71/2” per second, 3 minutes” (Kostelanetz, 1993, p. 59).

⁵² *Sounds of Venice* (1959): It is a score “for solo television performance, involving a large number of properties and four single-track tapes, 71/2” per second, 3 minutes each” (Kostelanetz, 1993, p. 59).

⁵³ Marino Zuccheri: He was the technician in the Studio di Fonologia Musicale della Rai di Milano. He was recording concerts on behalf of Rai (Restagno, 1987).

nearly inaudible” (Holmes, 2002, p. 7). The performance of Cartridge Music “requires one or more ordinary LP phonograph cartridges, handled by as many performers. Each cartridge is attached to its own amplifier and loudspeaker” (Silverman, 2012, p. 179). “The first performance of Cartridge Music was made by eight persons — including David Tudor, Benjamin Patterson, Cornelius Cardew, and Christian Wolff — in simultaneous performance with John Cage performing his Solo for Voice 2 at Cologne on October 6, 1960” (Dunn, 1962, p. 34).

In Cartridge Music, Cage “opened up through electronics the realm of amplified ‘small sounds’ as material for a musical composition intended for live performance” (Duckworth and Fleming, 1996, p. 141). He replaced “the needle of a phonographic cartridge with foreign objects such as pipe cleaners, wires, feathers, slinkies, matches, toothpicks, and the like” (Niebisch, 2012, p. 115). When performers substitute “springs, twigs”, and “other thin objects for the needles in cheap record player pickups, the surprising richness of these enormously amplified ‘micro-sounds’ rivaled the more labor intensive synthetic sonorities coming out of the European electronic music studios” (Collins, 2006, p. 33). Cage did not use “electronic instruments in his pieces, but rather normal electronic household appliances, sometimes these were used in an unconventional manner”. For instance, he used the phonocartridges “with the stylus in contact with items as a means to detect and amplify vibrations in them”. In addition, unlike the composers who used usually standard microphones, Cage used contact microphones in Cartridge Music (Dean, 2009, p. 69). He combined these kind of sonic techniques with his “reliance on performer improvisation and the use of random events and juxtapositions to determine musical structure at the time of performance, rather than being worked out at the time of composition (as with serialism) and specified in the score” (Brown, 2007, p. 124). His aim “was not only to create the possibility of electronic performance”, but also “to bring about a situation in which any determination made by a performer would not necessarily be realizable” (Griffiths, 2010, p. 154). For instance, when “one of the performers changes a volume control, lowering it nearly to zero, the other performer’s action, if it is affected by that particular amplification system, is inaudible” (Griffiths, 2010, p. 154).

The score of the Cartridge Music (see figure 3.2) is also for “piano or cymbal” and for “any number of players and loudspeakers”. Performers can prepare the parts from the score (Kostelanetz, 1993, p. 60).

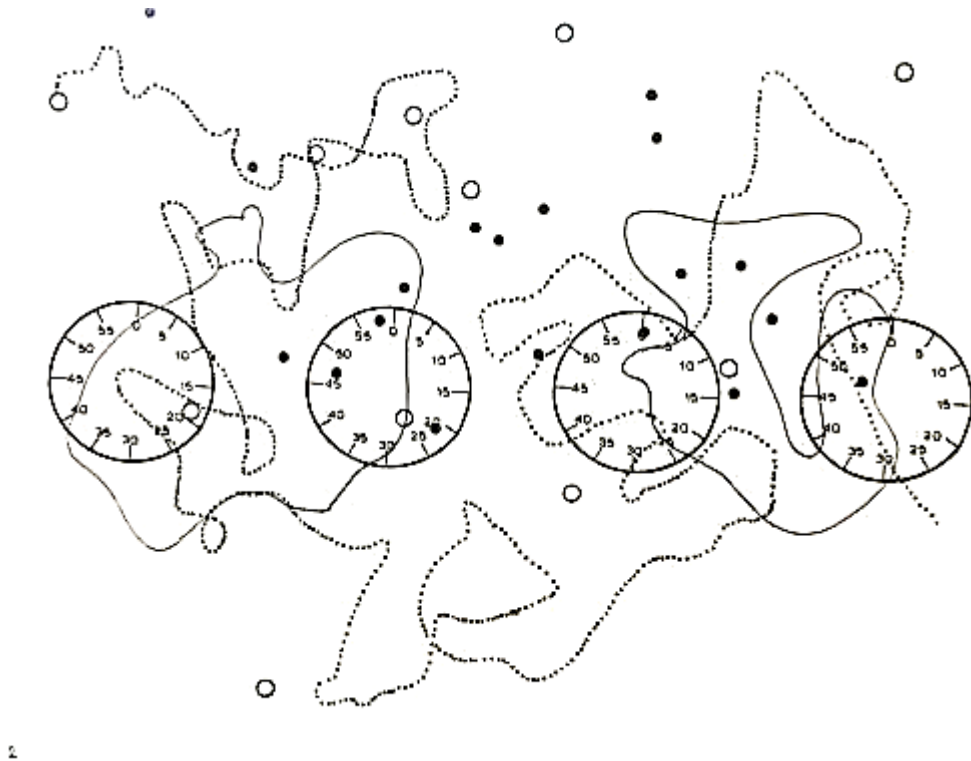


Figure 3.2 : John Cage, graphic score for Cartridge Music (Cage, 1960).

Fetterman (2010) writes about the use of the score materials, as follows:

There are twenty sheets, each numbered with a corresponding number of forms, measuring 8-3/4 inches vertically and 11-3/4 inches horizontally. There are four transparencies also measure 8-3/4 by 11-3/4 inches. The first transparent sheet contains 19 dots randomly distributed about the sheet; the second transparency contains 10 circles randomly distributed about the sheet, and the third transparency contains a dotted curving line which meanders over the entire sheet; with a circle at one end. The irregular design of the dotted line is further reinforced by its crossing over itself at six different places. The final transparency is a rectangle measuring 10 by 2-1/2 inches: at the center is a circular clock-face measuring 1-3/4 inches in diameter, marked in conventional five-second intervals from 0 through 55. (p. 60)

In writing the essay *Where Are We Going? And What Are We Doing?* "for delivery by four readers at the Pratt Institute, Brooklyn, in January, 1961, Cage used the materials for his *Cartridge Music* to compose four texts that are to be heard simultaneously" (Bernstein and Hatch, 2000, p. 214). Years later, Merce Cunningham used the Cartridge Music as an accompaniment in his choreography *Changing Steps*.

3.2. What is Prepared Piano?

The piano “is a traditional instrument in Western Music; however when it was ‘prepared’ according to a set of instructions it was capable of new sounds” (Leach, 2015, p. 109). The glossary of *A History of Western Music* defines Prepared Piano, as “an invention” in which “various objects—such as pennies, bolts, screws, or pieces of wood, rubber, plastic, or slit bamboo—are inserted between the strings of a piano, resulting in complex percussive when the piano is played from the keyboard” (Burkholder, Grout and Palisca, 2010, p. A-15). Thus, the prepared piano becomes “an act of melding a percussion ensemble with the piano” (Kahn, 1999, p. 115). Even if the materials are placed —mostly in a Grand Piano—the prepared piano still preserves “the piano’s shape, form and mechanics”. The materials can be established “anywhere along the entire range” of the strings (Palmieri, 2003, p. 301). The term *Prepared Piano* is used by the composers, pianists and the technicians to refer any unconventional piano playing. This playing includes pizzicato and muting as well (Jones, 2007). An image for the prepared piano is given below (see figure 3.3).

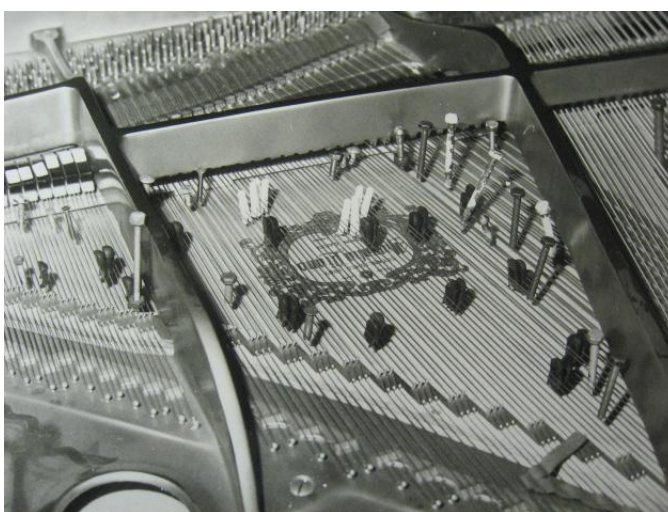


Figure 3.3 : Prepared Piano (Adrian, 2012).

In Cage’s musical notation, obtained sounds were completely different from the Western notation. Cage was organizing the materials very carefully and systematically on the strings, for instance, the octave of an A note did not possess the same sound with another octave as in the Western notation, on the contrary, the note had a fully different sound. Moreover, pedaling, especially the use of the una corda pedal changed the sound as well in Cage’s prepared piano works (Revill, 2014; Pritchett, 1996).

3.2.1 The Birth of the Prepared Piano and Bacchanale (1940)

In the late thirties, Cage was working at the Cornish School in Seattle, Washington as an accompanist. He was accompanying for Bonnie Bird's modern dance classes. One of Bird's pupil was the dancer Syvilla Fort. Only three or four days ago, she asked Cage to write a music for her perform "Bacchanal" and Cage accepted it. At that time, Cage was interesting in composing "music for percussion ensembles: pieces for three, four, or six players". For Syvilla's dance, Cage wanted to compose a music for percussion orchestra but there was only a "too little room" for Fort to perform. Thus, Cage "was obliged to write a piano piece". Since an African style accompaniment "would have been suitable" for Fort's dance, Cage started to compose a piece by using the "African twelve-tone row" as a basic material (Cage, 1979, p. 7). "I knew that wouldn't work for *Bacchanale*, which was rather primitive, almost barbaric" recalled Cage (Tomkins, 1965, p. 88). However, after a while, he did not satisfy with the conventional piano, and "decided to change it" (Cage, 1979, p. 7), saying, "I decided that what was wrong was the piano, not my efforts, because I was conscientious" (Worby, 2002). Then he remembered Henry Cowell's technique, playing inside the piano, by strumming, plucking or striking the strings. Henry Cowell was a name who had great influence on Cage in this sense. Cowell was one of the composers who was seeking for the color of sound. He "began to writing pieces in which *every note* was attacked or modified by the hands on the strings" (Hicks, 2002, p. 112). Cowell "coined the term *string piano* to describe his innovative techniques for performing directly on the strings of a piano" His *Piece for Piano with Strings* (1923), *Aeolian Harp* (1923), and *The Banshee* (1925), are his "popular string-piano works"(Gagné, 2011, p. 262). His use of "weird glissandos" and pizzicatos on the piano strings let him create a "new orchestral color". He enriched the piano "by extraordinary applications" (Cowell, 1933, p. 58-59). For instance, in *The Banshee*, he reaches "into the raised of the piano to manipulate the strings directly. He sweeps, plucks and even scrapes them with his fingernails to create the desired supernatural effects" (Candelaria and Kingman, 2012, p. 276).

Cage, in order to have an experiment in this manner, as Cowell had before, “went to the kitchen, got a plate, brought it into the living room, and placed it on the piano strings” (Cage, 1979, p. 7). Cage wrote the rest of the story in the foreword for Richard Bunger’s⁵⁴ booklet *The Well-Prepared Piano* (1973):

I played a few keys. The sound changed but the pie plate bounced around due to vibrations, and, after a while, some of the sounds that had been changed no longer were. I tried something smaller, nails between the strings. They slipped down between and lengthwise along the strings. It dawned on me that screws or bolts would stay in position. They did. And I was delighted to notice that by means of a single preparation two different sounds could be produced. One was resonant, the other was quite muted. The quiet one was heard whenever the soft pedal was used. (pp. V-VII)

After this experiment in the kitchen, Cage composed his *Bacchanal* “quickly and with the excitement continual discovery provided” (Cage, 1979, p. 8). Nevertheless, according to Bonnie Bird, Cage discovered the prepared piano by accident, when he was writing music for one of the Bird’s couple of works *Les Mariés de la Tour Eiffel*⁵⁵. While choreographing the work, she discovered a moment that she could apply to the dancers. She was needed “a fireman’s pole”, so she visited a fire department. However, since she could not afford even fifty cents, the firefighters gave her “a little piece of a pole”. Bird brought the piece to Cage just before the beginning of the class. (Dickinson, 2006, p. 71). Cage took the brass and set it “upon a tray on the piano”. When he began to play for the exercises, “it fell into the case and rolled around the strings”. The emergent sound appealed Cage a lot and “he got totally involved in rolling this thing up and down” recalled Bird. She believed that it was the beginning of Cage’s discover the prepared piano (Silverman, 2012, pp. 30-31).

The work *Bacchanale*, which is accepted as Cage’s first piece of prepared piano, was premiered on 28 April 1940, at the Cornish School, in Seattle (Nattiez, 1995). The

⁵⁴ Richard Bunger: He is also known as Richard B. Evans. “Internationally known composer-pianist, began writing serious music while a scholarship student at Oberlin Conservatory of Music in 1963. Since that time, his compositions have been recorded cited for awards, and widely performed in U.S.A and Canada” (Bunger, 1973, p. 100).

⁵⁵ *Les Mariés de la Tour Eiffel*: Ballet with Jean Cocteau’s scenario. “Originally entitled *La Noce* or *La Noce massacrée*, this work commissioned by Rolf de Maré, who had brought his *Ballets Suédois* to Paris during the winter of 1920-21” (Schmidt, 2001, p. 93). The composers were Auric, Poulenc and Milhaud. At the Cornish School, Bird choreographed Cocteau’s *Marriage at the Eiffel Tower*. The original music was composed by Cage, Cowell and George McKay (Miller and Liebermann, 2004).

work is composed for solo-prepared piano. In *Bacchanale*, Cage “extended this idea by placing a small bolts”, screws, weather stripping and nuts between the strings to get a new sound from the piano. “The resultant collection of twelve preparations, which cage termed ‘gamut’, made the piano sound as if it were a small percussion ensemble”. This gamut “consists predominately of weather stripping; the muted sounds it produces are reminiscent of the muted string-piano sounds used in earlier works” (Nicholls, 2002, p. 78). Cage acquired a harpsichord sound and dynamic range from the prepared piano. Inserting materials as screws, small bolts and nuts altered pitches and timbres, and thus he transformed the piano “into a percussion orchestra” (Maconie, 2010, p. 376), which he obtained non-western sounds. According to De Mille (2011), in that period, Cage was “out of the need to create certain sounds” and *Bacchanale* was the first of these works (p. 260).

Ultimately, I would like to mention about a problem with the chronology between Cage’s *Bacchanale* and *Second Construction*. Pritchett (1996) argued that “*Bacchanale* is dated in 1940”, the premiere was at the Cornish School, on 26 April 1940. However, in *Second Construction* “the piano is prepared with one or two items”. Therefore, it means that *Bacchanale* predated two months “thus suggesting that it was the first piece to use the prepared piano”, because it was composed in 1940, and premiered on 14 February 1940, in Portland. Nevertheless, Pritchett is “disinclined to doubt” Cage’s memory (p. 206) and he added:

Perhaps the 1940 dance program was a second performance or revised version of the piece, or perhaps the piano part of *Second Construction* was changed after the composition of *Bacchanale* to take advantage of that work’s innovations. None of the possible histories of *Bacchanale* is completely satisfactory; this will perhaps always will be a mystery. (p. 206)

3.2.2 Cage’s Dance Works for Prepared Piano

After *Bacchanale*, Cage did not compose another piece for the prepared piano. In the early forties, he resumed writing in this field. In 1942, Cage moved to New York City. Here, he and Cunningham “began developing dance programs” (Summers, 2004, p. 43), and Cage started a period of several years which he wrote solely for the instrument (Pritchett, 2007). He composed *Totem Ancestor* (1942), *Primitive* (1942), and *And the Earth Shall Bear Again* (1942). The “style and subjects” of these works “illustrate the continued appeal of humanity’s prehistoric past” (Johnson, 2011, p. 117). *Totem Ancestor* was composed for one of Merce Cunningham’s dance. In the

work, “eight notes are prepared with screws or bolts, two with weather stripping, and one with a screw and free-rattling nut” (Pritchett, 1996, p. 25). *Primitive* (1942) was a “large-scale prepared piano work” which was written for a dance of Wilson Williams. It combined “modal passages (centered around D) with chromatic and percussive effects” (Nicholls, 2002, p. 79). *And the Earth Shall Bear Again* (1942) was for the dancer Valeria Bettis. It “served to reacquaint him with the instrument and did not really break any new ground” (Pritchett, 2007). In this work, ten notes are prepared with small screws and woolen materials. It is a rattling and rhythmically brilliant work. After *Primitive*, only two days later, Cage composed *In the Name of the Holocaust* (1942), for Cunningham’s dance. This work has “similar gamut” with *Primitive*. It “utilizes a variety of Cowell’s string-piano techniques including plucking muted and open strings and clusters for the flat of the hand and forearm” (Nicholls, 2002, p. 79). *Our Spring Will Come* (1943) was the title of Pearl Primus⁵⁶’s dance that Cage wrote music. “It was to have been accompanied by the recitation of a Langston Hughes⁵⁷ poem” (Griffin, 2013, p. 51). The work “departed from the jazz accompaniment of the immediately preceding solos”. It is not documented how and where Cage and Primus met (Manning, 2004, p. 172), but Gordon Heath (1992), mentioned about Cage and Pearl Primus as follows:

When she was creating “Our Spring Will Come” she grunted and hummed, whispered, sang and spoke as she gave herself to movement. John Cage came along to watch. When Pearl took time out, he opened the grand piano and affixed his pocketfull of clamps and assorted hardware to certain strings like a plumber installing pipe joints. The “composition” that resulted was an uncanny percussive equivalent of Pearl’s dialogue with herself. I marveled and enunciated my narration warily.(p. 60)

Tossed As It Is Untroubled (1944) was written for a dance by Merce Cunningham. The original title of the work was *Meditation*. The music consists mostly of an energetic unaccompanied line improvised on just five tones” (Pritchett, 1996, p. 26). Kostelanetz (1993) describes the piece as “lively dance in periodic rhythm written in the rhythmic structure 7 times 7. The piano preparation is not elaborate” (p. 9). A

⁵⁶ Pearl Primus: (1919-1994). Modern dancer, choreographer, dance company director, anthropologist. An athletic dancer of dramatic intensity, Pearl Primus transformed African and Caribbean dance forms into powerful political and social statements” (Otfinoski, 2010, p. 184).

⁵⁷ Langston Hughes: James Mercer Langston Hughes (1902-1967). He was an American poet who wrote short stories, plays and works on African American culture. He was the leading figure of the Harlem Renaissance (Leach, 2004).

Valentine Out of Season (1944) for *Effusions avant l'heure* was choreographed by Merce Cunningham. Cage dedicated this short, melancholic piece to Xenia, and it “dates from the time when his marriage was falling apart” (Larson, 2012, p. 118). *Root of an Unfocus* (1944) was a dance music for Cunningham. It was “a rhythmically simple minimalistic work” which “employs an eight-note gamut with screws and bolts” (Nicholls, 2002, p. 79). Kostelanetz (1993) describes the work as “dramatic in character and the piano preparation is not extensive” (p. 10). Merce Cunningham quoted that the premise of the dance was “concerned with fear. It began in conscious awareness of something outside the individual, and after its passage in time ended in the person crawling out of the light” (Vaughan, 1997, p. 29). Cage, in the year 1944, wrote many pieces for Cunningham’s dances, and he had a crucial development on writing dance music. *Spontaneous Earth* (1944) was one of them. The same year Cage composed *The Unavailable Memory Of* (1944). The work was written on a single-line texture (Nicholls, 2002). In 1945, for another dance by Cunningham, Cage composed *Mysterious Adventure*, which “employs a large gamut consisting of twenty-seven notes” (Nicholls, 2002, p. 79). Elliot Carter described the work as “a maze of shivery strange and delicate noises” (Vaughan, 1997, p. 36). *Mysterious Adventure* (1945) had a “rushing, staccato accompaniment” for these twenty-seven alteration prepared piano (Silverman, 2012, p. 64). The same year, in 1945, Cage this time composed for a dance of Jean Erdman. The work *Daughters of the Lonesome Isle* (1945) was notated conventionally. Kostelanetz (1993) described the piece as an “atmospheric character” (p. 10). McKyle (2002) mentioned that for the *Daughters of the Lonesome Isle*, John Cage and David Tudor engaged in the elaborate preparation of Jean Erdman’s grand piano. Cage’s detailed chart indicated where the bolts, rubbers, and nuts were to be placed. Thus, the instrument turned an exotic composite of gamelan.

3.2.3 Sonatas and Interludes

John Cage composed his most known prepared piano composition *Sonatas and Interludes* between 1946-1948. In 1948, in early April, Cage made a visit to Black Mountain College, near Asheville, North Carolina. He arranged his visit on Cunningham’s behalf. In addition to accompanying Cunningham, Cage performed

the premiere of the *Sonatas and Interludes*, on April 6, 1948 “which had just been completed the month before” (Haskins, 2012, p. 52).

Sonatas and Interludes is a work for solo prepared piano and lengths for 70 minutes. It is generally remembered as Cage’s “prepared piano masterwork”. Cage dedicated the work to pianist Maro Ajemian. She played four of the pieces in a concert, in April 1946, but Cage did not complete the rest of the work for another two years. When Cage completed the whole work, Ajemian played it at New York’s Carnegie Recital Hall. *The New York Times* reviewer wrote that the ‘haunting and lovely’ work left him thinking of Cage as ‘one of this country’s finest composer’ (Silverman, 2012, p. 69).

When he was writing his *Sonatas and Interludes*, Cage was living at the East River. In this period, he was increasingly interested in Asian and Oriental philosophy, and he benefited from his readings on Indian sources (Patterson, 2002). Cage mentioned about this period as follows:

After reading the work of Ananda K. Coomaraswamy, I decided to attempt the expression in music of the “permanent emotions” of Indian tradition; the heroic, the erotic, the wondrous, the mirthful, sorrow, fear, anger, the odious, and their common tendency toward tranquility. These pieces were the first product of that effort.... (Kostelanetz, 1970, p.129)

Cage, in his *Sonatas and Interludes* made a selection of piano preparations. Cage (1961) recalled that “the materials, the piano preparations, were chosen as one chooses shells while walking along a beach. The form was as natural as my taste permitted” (p. 19). And he added “nothing about the structure was determined by the materials which were to occur in it; it was conceived, in fact, so that it could be as well expressed by the absence of these materials as by their presence” (p. 19-20). The entire work consists of “sixteen short sonatas, grouped into sets of four and separated by interludes”. It was “Cage’s first work to reflect an alternative conception of the function of music: to quiet and sober the mind” (Campbell, 2011, p. 321). Cage’s Sonatas in his *Sonatas and Interludes* are apart from the traditional sonata forms. They “allow us to outline the development or history of a musical genre – a history marked by diversity more than uniformity, by change more than continuity” (Schmidt-Beste, 2011, p. xii). The *Sonatas and Interludes* have an order. The table of the order is given below (Table 3.1).

Table 3.1 : The order of the Sonatas and Interludes.

First Interlude: Sonatas I-IV
Second Interlude: Sonatas V-VIII
Third Interlude: Sonatas IX-XII
Fourth Interlude: Sonatas XIII-XVI
Gemini Sonatas: Sonatas XIV and XV

The Sonatas XIV and XV are paired as *Gemini Sonatas* “after a sculpture by Richard Lippold⁵⁸” (Nicholls, 2002). All the preparations of the piano for *Sonatas and Interludes* takes nearly two or three hours. Not every note is prepared. Some of them are retained as the normal piano sound. For some strings, more than one type of material are used (Wilkins, 2006). The materials are; screw, rubber, nut, plastic, small, medium and long bolts, furniture bolts and eraser. To transform of the characteristic of the piano, the materials are placed between the strings of the keys, which are played (Cage, 1960). The table of the preparations are given below (see figure 3.4). In the table of Cage, it is written which strings should be prepared with the materials. For instance, a screw or a bolt could be placed between the first and second strings, or the second and third strings, or the first, second and third strings together.

⁵⁸ Richard Lippold: (1915-2002). American sculptor, who was known by welding wire and roads into complex geometric structures (Knobler, 1970).

3.2.4 Cage's Two Prepared Piano Works

A Book of Music (1944) and *Three Dances* (1945) were written for the duo-piano performers Robert Fizdale⁵⁹ and Arthur Gold⁶⁰. In these works, Cage “set out to compose works in which such tempo changes do not destroy the structural proportions. When the tempo changes the phrase lengths changes as well becoming longer as the tempo increases and shorter as it decreases” (Pritchett, 1996, p. 28). *A Book of Music* was structured according to Cage's ideas about Mozart. He recalls that, in his *Book of Music for two Pianos* he used three different kinds of scale as in Mozart's music. These are the chromatic and the diatonic, and the “larger steps of thirds and fourths”. In this work, the two pianos “are prepared at the same points on the same strings but with different materials” (Cage, 1948, p. 40). In *A Book of Music*, we can hear the orientalism that Cage suggested to the listener. The exotic sound of the prepared piano and the excited rhythms make the listener to follow the melodic and rhythmic line until the end of the piece, without any interruption.

The next work *Three Dances* was choreographed by Merce Cunningham under the title *Dromenon*. These dances are written “as a gesture of friendliness towards the dance as an art with which I have long been associated” wrote Cage in his *A Composer's Confessions* (Cage, 1948, p. 40). When I have first listened to this music, I instantly had the imagination of an African tribe who was making the music with their percussive instruments. The most noticeable element in Cage's prepared piano works for me is the permanence. In his *Three Dances* I had the same feeling as well.

⁵⁹ Robert Fizdale: (1920-1995). He was a pianist, biographer and gastronome. He was a partner in the piano duo known as *Gold and Fizdale* with Arthur Gold (Russell, 1995).

⁶⁰ Arthur Gold: (1917-1990). He was a Canadian pianist who played together Robert Fizdale in the two-piano ensemble. They made their New York debut in 1944, with Cage's works, at the New School for Social Research (Kozinn, 1990).

4. CAGE'S WORKS COMPOSED WITH THE I CHING AND CHANCE OPERATIONS

Cage, in his compositions, from the early fifties, until to the mid-eighties drew on the I Ching. At that time, Cage's compositional process derived by the I Ching and chance operations. His first goal was to remove the ego while composing. Furthermore, he was trying to open new perceptions about music. Cage composed almost thirty musical works with the chance operations. These works are given in the table below, with their titles and dates (Table 4.1).

Table 4.1 : Cage's works composed by I Ching and chance operations.

Concerto for Prepared Piano and Chamber Orchestra (1951)	Music of Changes (1951)
Imaginary Landscape No.4 (March No.2) (1951)	Two Pastorales (1951)
4'33" (1952)	Imaginary Landscape No.5 (1952)
Music for Carillon No.1 (1952)	Seven Haiku (1951-52)
Water Music (1952)	Williams Mix (1951-53)
Music for Piano 1-84 (1952-56)	Radio Music (1956)
Winter Music (1957)	Concert for Piano and Chamber Orchestra (1957-58)
Solo for Voice 1 (1958)	Atlas Eclipticalis (1961-62)
Cheap Imitation (1969)	HPSCHD (1967-69)
Sixty-two Mesostics Re Merce Cunningham (1971)	Cheap Imitation (orchestra version 1972)
Etudes Australes I, II and VIII (1974-75)	Renga (1975-76) with Apartment House 1776 (1976)
Freeman Etudes (1977-90)	Etudes Boreales for Cello Solo and for Piano Solo I-IV (1978)
Ryoanji: Solos for Oboe, Flute, Contrabass, Voice, Trombone with Percussion or Orchestral Obbligato (1983-85)	Etcetera 2 81985)

4.1 Compositions with the I Ching in the Early Fifties

4.1.1 Concerto for Prepared Piano (1951) and Music of Changes (1951)

Cage's discovery and experiments with chance operations can be thought as the end of 1950 and the beginning of 1951. Even the *Music of Changes* is known to be the Cage's first work which was composed by the I Ching, actually, he initially tried the I Ching in the third movement of his *Concerto for Prepared Piano and Chamber Orchestra*. When Cage was composing this work, he had already the *Book of Changes* which came as a gift from his student Christian Wolff. He benefited from the I Ching in the third movement of the Concerto, but the use of the method was "quite minimal" (Lejeune, 2012, p. 176). Cage, in this work, "had already moved towards eliminating his own compositional intervention by arraying his pre-composed materials in charts". In the last movement, he generated hexagram numbers to remove himself from the process (Haskins, 2012, p. 63). To combine the piano and the orchestra for the first time, Cage made a new chart. With this chart he moved from square to square on the choice. He used the I Ching method by tossing the coins to determine for both the new chart and the magic squares (Stevenson, 2015). He had a chart of "224 individual sound events scored for piano, orchestra, or a combination of both, arranged into sixteen rows (lettered A-Q) and fourteen columns (numbered 1-14)" (Pritchett, 2014). According to Cage's charts, unbroken lines presented the orchestra and broken lines the piano. If a not moving line was thrown, the new cell chart would be filled with the relevant cell of the orchestra or the piano. But, if a moving line was thrown, then a new cell had to be composed. Ultimately, "if an unbroken line moved to broken line, the cell would begin with the orchestra and end with the piano" (Revill, 2014, p. 131). The first two movements of the concerto are heard as if Cage wants to fill the time always with voices. Or as if he wants us permanently to concentrate on sounds. But in the third movement, unlikely to the first two movements, there are long silences. These long silences make us to comprehend the use of the I Ching. Because the odd numbers mean silence and the even numbers mean sounds. There is no other choice except silence and sound, in the entire third movement. In an interview with Daniel Charles, Cage (1981) mentioned the *Concerto for Prepared Piano and Chamber Orchestra* as follows:

I wrote a *Concerto for Prepared Piano and Chamber Orchestra*. I made it into a drama between the piano, which remains romantic, expressive, and the orchestra, which itself follows the principle of oriental philosophy. And the third movement signifies the coming together of things which were opposed to one another in the first movement. (p. 41)

With his study of Zen Buddhism, he started to live his life as a particular person, and with his practice on the I Ching, beginning the third movement of his *Concerto for Prepared Piano and Chamber Orchestra*, he began to develop his use of chance operations, specifically through the I Ching.

In 1951, he composed his *Music of Changes*, which consists of four books and based on the charts made by Cage and filled by the hexagram numbers of the I Ching. In this work, there is again a cell system, which occurred from sound and silence, mobile or immobile movements. More information about the *Music of Changes* will be explained in the next chapters with the detailed analysis of the charts and sixty-four hexagrams.

4.1.1.1 Imaginary Landscape No.4 (1951)

When Cage was composing *Imaginary Landscape No.4* for twelve radios, in 1951, the I Ching offered him “an intricate methodology based upon chance” (Fetterman, 1996, p. 18). The reason of writing for radios was connected to Cage’s idea about overcoming his dislike of radio. He mostly used jazz records in this work (Revill, 2014). For the *Imaginary Landscape*, he had a goal, “that of erasing all will and the very idea of success (Larson, 2012, p. 206), and he achieved it with the I Ching. Cage (1961) explained the purpose of *Imaginary Landscape No.4* as follows:

When I wrote the *Imaginary Landscape* for twelve radios, it was not for the purpose of shock or as a joke but rather to increase the unpredictability already inherent in the situation through the tossing of coins. Chance to be precise, is a leap, provides a leap out of reach of one’s own grasp of oneself. Once done, forgotten. (p. 162-163)

In the *Imaginary Landscape No.4*, the I Ching determined the notation. The score was written for two performers for each radio, twenty-four performers, and a conductor to direct the twelve radios. At each radio, one of them was “playing the radio station dial”, and the other was “controlling the amplitude and timbre” (Fetterman, 1996, p. 18). Cage utilized the I Ching to create the charts of the work. The charts referred to superimpositions, dynamics, tempi, durations and sounds. For instance, the sound charts has thirty-two cells which contained silences. In the

dynamic chart only sixteen of the sixty-four produce changes, and the others remain in their previous situation (Cage, 1961).

4.1.1.2 Two Pastorales (1951)

Cage's *Two Pastorales* composed in 1951 for David Tudor. According to Tudor, the most important thing in the *Two Pastorales* is "the timbral and gestural language it utilizes, itself, in part, a further restitution of elements from Cage's earlier works" (Iddon, 2013, p. 41) such as *Sonatas and Interludes* (1948) and *Concerto for Prepared Piano and Orchestra* (1951). The work consist of two pieces. In the second Pastore, Cage used again his prepared piano technique. When in the *Music of Changes* there are eight layers, in the *Pastorales* there are only two. Therefore, a thinner texture emerges in *Pastorales* in proportion to *Music of Changes*. In some places "long empty spaces appear between the sounds", however, at some places, Cage used the pedal to fill these silences (Pritchett, 1996, p. 89). The rhythmic structure of the pieces are 2, 3 1/2, 5 1/2. Cage designated this structure for changing tempi. The charts comprised from tempi, amplitudes, sounds, layers and durations just as in the *Music of Changes*. When I have heard the music for the first time, two contrast ideas rised in my mind; emptiness and awakening. Since the long empty spaces exist through the work, the listener –for a while- thinks that there is no music, there is nothing. Then suddenly it is heard a single voice, or a chord which is played by striking the strings with fingers, or pizzicati and string straches. It is exactly at the moment when it is comprehended that the music actually continues. In the second Pastore, Cage used two kind of whistles. In my opinion, these whistles are voices which try to awake us.

4.1.1.3 4'33" (1952)

Perhaps the most interesting work of John Cage is his silent work 4'33". It is pronounced as four minutes, thirty three seconds. The piece has three movements, but there is no sound in any of them (see figure 4.1).



Figure 4.1 : John Cage, score of 4'33" (Cage, 1960).

In 1952, Cage presented *nothing* most vividly in the form of 4'33" (Gann, 2013, p. xx). It was written for "any instrument or combination of instruments" (Kostelanetz, 1993, p. 52). Actually, 4'33" was conceived around 1947-48, but Cage hesitated to present his silent work; because he thought that "it would be taken as a joke and a renunciation of work" (Kostelanetz, 2003, p. 68). Therefore, he decided to wait for four years. Perhaps, he wanted to wait for the time, when the audience would have been ready to hear the silence in a concert hall. Because normally people go to the concerts to hear some music for voice, instrument, ensemble or orchestra; as in the regular concerts. But in the premiere of the 4'33", they were into the concert hall to hear only the sounds of their environmental constitution. This silent work could be appraised as a Cageian performans, because the piece is on a performer (David Tudor), who comes near to the piano and sits in order to play it, but does not play a note, but only turns the blank pages. In addition, he opens and closes the piano lid three times, to separate three movements. Naturally, the sounds which we qualified

as *silence* are actually the environmental sounds which come from the crowded audience. “When Tudor said that 4’33” is the most intense listening experience you can have, he was describing a state in which mind, body, and spirit are the highest possible level of concentration, analogous to the condition of minimum entropy” (Bernstein and Hatch, 2000, p. 72). Cage wrote that “the lengths of time were determined by chance operations, but could be any others” (Kostelanetz, 1993, p. 52). In an interview, he explained that the method of the composition was on Tarot cards (see figure 4.2), and he talked about the reason of using these cards:

It was done just like a piece of music, except there were no sounds – but there were durations. It was dealing these cards – shuffling them on which there were durations, and then dealing them – and using the Tarot to know how to use them. The card-spread was a complicated one, something big.

[Question: Why did you use the Tarot rather than the I Ching?]

Probably to balance the East with the West. I didn’t use the [actual] Tarot cards, I was just using those ideas; and I was using the Tarot because it was Western, it was the most well-known chance thing known in the West of that oracular nature. (Fetterman, 1996, p. 72)

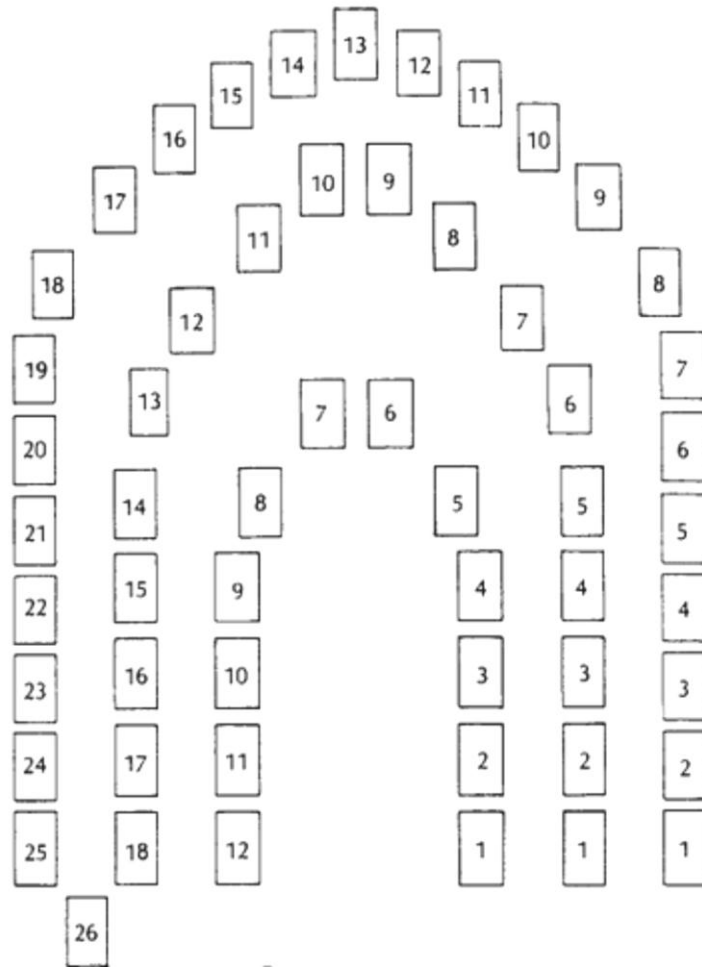


Figure 4.2 : The Horseshoe spread. The Tarot card-spread used by Cage in composing 4'33" (Kaplan, 1971, p. 179).

Cage in an interview talked about the chance operations and said "Chance, as I use it, is not something that I must control, nor that must control me" (Cage and Charles, 1981, p. 148). As in the *Music of Changes*, Cage in his 4'33" avoided form his likes and dislikes because he thought that "the music should be free of the feelings and ideas of the composer" (Kostelanetz, 2003, p. 69).

4.1.1.4 Imaginary Landscape No.5 (1952)

In 1952, the dancer Jean Erdman asked Cage if he could write an accompaniment for her dance *Portrait of a Lady*. Cage was already seeking an opportunity to grow his experiments on tape, and on January 12, 1952, in eighteen hours, he completed his *Imaginary Landscape No.5* which is "the first American piece for tape" (Cage, 1991, p. 4). In the composing process the chance operations and the I Ching chart system were used (Revill, 2014). The score of the *Imaginary Landscape No.5* is "for making

a recording on tape, using as material any 42 phonograph records. The records used were exclusively jazz (Cage, 1952). Each graph unit equals three inches of tape (15 ips). Differences of amplitude (1-8) are given. The rhythmic structure is 5 times 5” (Kostelanetz, 1993, p. 52). The notation is indeterminate “of its performance”. In this music, Cage decided only how the basic contribution “is to be done”. The rest is determined by the performer (Fetterman, 1996, p. 20).

4.1.1.5 Music for Carillon No.1 (1952)

In October 1952, Cage composed his first *Music for Carillon No.1*. It was a graphic notation (see figure 4.3) which was written on a graph paper. He wrote it for Mary Carolyn Richards⁶¹, “using differently shaped scraps of paper folded and small holes cut in them at the points of folding. Then used these as stencils at points in time-space *I-Ching* determined” (Cage, 1961, p. 163).

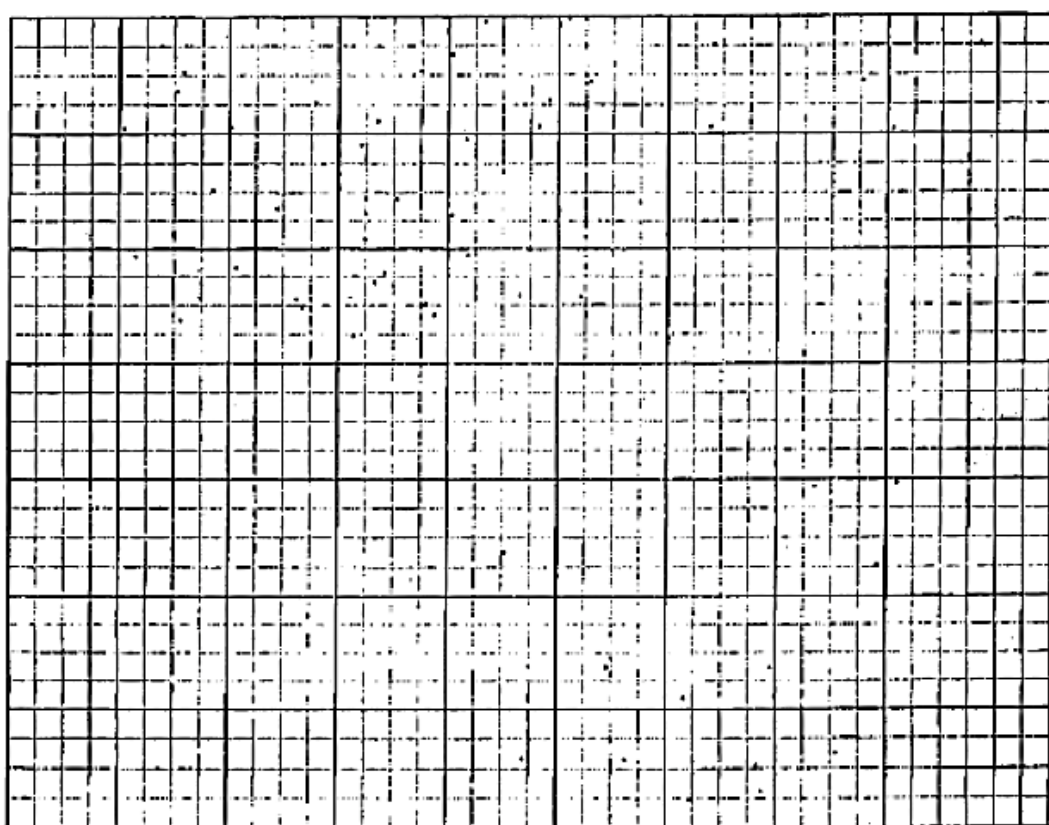


Figure 4.3 : Excerpt from Music for Carillon No.1, page 1 (Cage, 1961).

⁶¹ Mary Carolyn Richards: (1916-1999). She was an American poet, potter and writer.

In the composition process of the *Music for Carillon No.1*, Cage “has employed templates and incidental imperfections of the music paper to determine compositional elements” (Apel, 1969, p. 27). As Pritchett (1996) explained, “the method of composing the piece consisted of plotting points onto this graph by means of templates, made by arbitrarily folding pieces of paper and then making holes at the intersections of the folds” (p. 92). Kostelanetz (1993), explained the details of the piece as follows:

On the graph, one inch horizontally equals one second, and three vertical inches equal any pitch range. A performer may use this graph to make any version he requires. The 2- and 3-octave versions have been notated. The composition means involved the use of template stencils with respect to a rhythmic structure at points in it determined by chance operations. [In the 2- and 3-octave versions] whole notes are notated on conventional staves where one system equals seven seconds. When two notes are to be played simultaneously, they are connected by a stem. The player uses a stop-watch in performance. (p. 53)

4.1.1.6 Seven Haiku (1951-52)

“John Cage wrote such improvisatory pieces as Indian raga and organized his musical forms by means of tala principle, haiku and tanka number row 5-7-5 and 5-7-5-7-7” (Just and Wojtazsek, 2013, p. 180). His interest in Buddhist concept of chance and change influenced his *Seven Haiku* (1951-52). He wrote his Haiku II, III, IV, and V after he went to the lectures of Daisetz Teitaro Suzuki, at Columbia University, in March 1951 (Gillespie, 2012). *Seven Haiku* is a work that consist of short pieces and mirrors the Japanese poetic form of three lines of five-seven-five syllables” (McCarty, 2009). It was one of Cage’s works which was composed by “using a combination of durational structures and charts of materials” (Johnson, 2011, p. 42). In addition, the silence had an important role throughout the work. In this piece, “not only the method but the actual charts of *Music of Changes* were used” (Pritchett, 1996, p. 89). According to Revill (2014), Cage mostly used his I Ching and chance operations technique for piano. *Seven Haiku* is also one of them. Cage dedicated his Haiku’s to people who had helped him with his problem of livelihood. Some of these names are Willem de Kooning and Maro Ajemian (Kostelanetz, 2003).

4.1.1.7 Water Music (1952)

Water Music (1952) is Cage's one of the most extreme pieces, which was written for solo piano. G. F. Handel had composed a work called *Water Music*, which was premiered in 1717. Cage said that "Handel done that before, except mine had real water in it" (Kostelanetz, 2003, p. 93). The compositional materials of the work contains "radio, whistles, water containers" and "deck of cards". During the performance, the "score to be mounted as a larger poster". The poster is meant to be seen by the audience. "The composing means were chance operations derived from the *I Ching*" (Kostelanetz, 1993, p. 53). According to Fetterman (1996), Cage used the *I Ching* "as a method for structure and selection of events rather than using it its original symbolic divinatory or meditative context" (p. 41). Cage, with this work, created a musical theater piece. Thus, the audience followed the performance with both their eyes and ears. Cage decribed his *Water Music* as follows:

The *Water Music* wishes to be a piece of music, but to introduce visual elements in such a way that it can be experienced as theater. That is, it moves toward theater from music. The first thing that could be theatrical is what the pianist is looking at—the score. Normally nobody sees it but him, and since we're involved with seeing now, we make it large enough so that the audience can see it. I was working at the time on chance operations and a chart that enabled me to determine what sound pops up at what time and how loud, etc. So I simply put into the chart things that would produce not only sounds but that would produce actions that were interesting to see. I had somewhere gotten the notion that the world is made up of water, earth, fire, etc., and I thought that water was a useful thing to concentrate on. So the possibilities that I put into the chart involved, not exclusively, but largely, water. (Kostelanetz, 2003, p. 112)

The work begins with the radio music. While this radio music continues to play, the performer plays some chords on the keys. He uses whistles and right after he stay away from the piano. After a while, he closes the lid of the piano hardly, and starts to scramble the cards rapidly. He places them on the strings, by making some noises with the help of the sustain pedal. He puts away the cards, open the lid of the piano, and restarts to play. Then he prepares the piano with four objects (the sort of these four objetcs are left to the performer) and plays. After this, he strokes a stick on the piano, then plays for nearly 7-8 seconds, and he turns off the radio. Soon, he again turns on the radio and pour the water from one receptacle to another, and he makes it back again. He comes again near to the piano, plays for a second, and waits for a while without playing. He comes to the table which the receptacles stay on, and pour

the water from one receptacle to another, and plays again. This time, he uses the whistle in a bowl that is full of water. He takes again his whistle and plays it by creating an ambulance or wind voice. He plays again, and turns off the radio. The score of the *Water Music* is given below (see figure 4.4).

RADIO AT 102.5
(FRANKS CHANGED AT DISCRETION OF WATER
00 WITHIN RANGE OF 5 AND 6)

1:15
JACK WHISTLE IN
BOWL OF WATER
(AS LONG AS WATER FILL-
ING FOR WHISTLE)

1:00
1:15

1:20 1:25 1:30-1:35

2:15
SLAM KEYBOARD LID SHUT (=) (TEND)
SEE RE DECK OF CARDS: DEAL 7
AND RADIO STRINGS: (ALL THIS)
RAPIDLY AS AVAILABLE

2:42.5 2:54.75 3:02 3:04.25 3:08.25
TUNE RADIO
TO 88

3:12.75 3:33 3:43 3:50.5
TUNE RADIO
TO 101 AND
TURN OFF

4:00.75 4:03 4:03.75
4:28.75 4:30.75 4:37.75
GRADUALLY CHANGE
RADIO TO 102.5 (FOR 2.0002)

5:43.25 5:50.5 5:52.5 5:56.25
RIP
WATER FROM
ONE RECEPTACLE
TO ANOTHER

6:00.75 6:05
JACK WHISTLE
GRADUALLY INTO
WATER

6:24.5 6:30.25 6:40
SIREN
TURN
RADIO
OFF

Figure 4.4 : John Cage, *Water Music* (Cage, 1961).

4.1.1.8 Williams Mix (1951-53)

Williams Mix (1951-53) was the first realisation of Cage's octophonic⁶² tape piece. It is "involved the precise cutting/splicing of tape-recorded sounds to create eight separate reel-to-reel, monaural, 15-ips magnetic tape masters for the four-minute, fifteen-second piece" (Hall and Sallis, 2004, p. 189). The title refers to the architect Paul Williams because *Williams Mix* was supported financially by him and became a part of the *Project for Music and Magnetic Tape* which was initiated by John Cage and David Tudor (Nicholls, 2002). Pritchett (1996) says that *Williams Mix* "is a piece of *musique concrète*⁶³, made up of recorded 'real' sounds" (p. 90). Cage created sound charts and collected the materials for these charts. He catalogued all sounds into six categories "as A, B, C, D, E, and F", thus he could do things "to any sound that was satisfactory as A" (Kostelanetz, 2003, p. 172). *A* is for "city sounds", *B* for "country sounds", *C* for "electronic sounds", *D* for "manually-produced sounds (including music)", *E* for "wind-produced sounds (including songs)", and *F* for "small sounds requiring amplification" (Pritchett, 1996, p. 90). Ross (2007), mentioned that "Cage subjected these to *I Ching* manipulations, producing constant jumps from one sound to another or buzzing, scrambled textures of up to sixteen simultaneous layers" (p. 402). *William Mix*'s score is 192 page. Cage "have illustrated it in the notes to the Town Hall program" and defined the piece as "a dressmakers pattern" which "shows where the tape shall be cut, and you lay the tape on the score itself" (Kostelanetz, 2003, p. 168). The excerpt from the score is given below (see figure 4.5).

⁶² Octophonic: "Eight channels surrounding an audience, a classic for electroacoustic music: typical arrangements are eight spaced on a circle by 45° (oriented with first speaker at 0° or at 22.5°), or the vertices of a cube to bring in a double quadraphonic set-up with elevation" (Collins, 2009, p. 60).

⁶³ Musique Concrète: [Fr.] Concrete music. Music prepared from recorded sounds. This music "should not use electronically synthesized sounds, but the distinction has been increasingly blurred such that the term electronic music now covers both" (Kennedy, Kennedy and Rutherford-Johnson, 2012, p. 584).

Certainly I intended to continue working... by consulting the *I Ching* as usual. But I also wanted to have a very rapid manner of writing a piece of music. Painters, for example, work slowly with oil and rapidly with water colors... I looked at my paper, and I found my “water colors”: suddenly I saw that the music, all the music, was already there. (Johnson, 2011, p. 45).

After his discovery on water colors, Cage composed his piece *Music for Piano 1* in 1952, for Jo Anne Melcher’s choreography *Paths and Events* and dedicated the piece to her. After this beginning, he continued to compose his series of *Music for Piano*, starting with his *Music for Piano 2* in 1953. This work was composed for dancer Louis Lippold. For the pitches, the paper imperfections are used again, and the *I Ching* was used to determine sounds and rhythms. Cage composed his *Music for Piano 4-19* (1953) for Merce Cunningham’s dance *Solo Suite in Space and Time* (Pritchett, 1996). Cage (1961) expressed that in *Music for Piano* “structure is no longer a part of the compositions means” (p. 22). In *Music for Piano 2-20*, “tempo and dynamics are free”, and “tone production was determined by chance operations” (Kostelanetz, 1993, p. 54). In this work, the ruling agent of the structure was “the absence of the mind”. The sound material was clear. They were “only single tones of the conventional piano”. These sounds were played on the strings as plucked or muted. Cage also used the noises inside or outside the piano construction (Cage, 1961, p. 27). *Music for Piano 4-19* and *21-84*(1955-56) “may be performed single or in any combination with one another by one or many pianists” (Iddon, 2013, p. 50). According to Haskins (2012), *Music for Piano 4-19* (1954) “extended the idea of chance music to a new level. The performer chooses the tempo, the order of pages, even what music to omit and what to include. Thus the overall profile of such music could be radically different each time it was performed” (p. 69). *Music for Piano 21-52*⁶⁴ was composed in 1955. There are two groups. Each group consists of 16 pieces. These pieces may be played alone or together. The groups also may be played with or without *Music for Piano 4-19*. Overlapping of and silences between the pieces are allowed. Cage (1961) says that “Given a programmed time length, the pianists may

⁶⁴ *Music for Piano 21-52*: The detailed description for *Music for Piano 21-52* is given in Cage’s book *Silence*, as “To Describe the Process of Composition Used in *Music for Piano 21-52*”.

make a calculation such that their concert will fit it” (p. 61). He mentioned his use of the I Ching in *Music for Piano* as follows:

The sixty-four possibilities of the *I Ching* are divided by chance operations into three groups relative to three categories: normal (played on the keyboard) ; muted; and plucked (the two latter played on the strings). For example, having tossed numbers 6 and 44, a number 1 through 5 will produce a normal; 6 through 43 a muted; 44 through 64 a plucked piano tone. A certain weight of probability exists in favor of the second and third categories. Though this has not appeared to be of consequence, it indicates a possible change in “technique”. (Cage, 1961, p. 61).

4.1.2 Compositions with the I Ching in the Late Fifties

4.1.2.1 Radio Music (1956)

Cage composed *Radio Music* for 1-8 radio players. The composing means are chance operations. “The radio piece” Cage says, was written “more or less to please the people who were disturbed over the *Imaginary Landscape No.4* because it was so quiet” (Kostelanetz, 2003, p. 166). Cage divided his *Radio Music* in eight part (A-H). Every piece could be played alone or with a combination of the other players. The parts are divided in four (I, II, III, and IV). They should be played according to the tables which are written by Cage and each piece has to be played in six minutes, including silences (Jäger, p. 180). “Durations of tunings are free, but each is to be expressed by maximum amplitude” (Kostelanetz, 1993, p. 56). In the score there are 56 different frequencies, between 55-155 KHz. These are notated with numbers (see figure 4.6) which could be projected during the performance. The tunings for *Radio Music* were selected using the I Ching (Hope, 2011).

PART A OF RADIO MUSIC to be played alone or in combination with Parts B-H. In 4 sections (I-IV) to be programmed by the player with or without silence between sections, the 4 to take place within a total time-length of 6 minutes. Duration of individual tunings free. Each tuning to be expressed by maximum amplitude. A _____ indicates 'silence' obtained by reducing amplitude approximately to zero. Before beginning to play, turn radio on with amplitude near zero.			
I	(I cont.)	(IV cont.)	
105	107	91	
_____	_____	_____	
125	69	146	
55	107	69	
_____	II	56	_____
91	124	97	
60	125	_____	
69	_____	91	
76	120	156	
112	55	_____	
56	56	55	
_____	125	155	
86	69	128	
73	84	_____	
127	120	138	
73	III	_____	
148	76	107	
76	_____	_____	
109	IV	99	
63	_____	_____	
67	69	153	
91	_____	63	
86			
73			

JOHN CAGE
STONY POINT, N.Y.
MAY 1956

Figure 4.6 : John Cage, Radio Music, Part A (Cage, 1961).

4.1.2.2 Winter Music (1957)

The score of the *Winter Music* consisted of “20 unnumbered pages plus pages with performance instructions. The 20 pages were used in part or in whole by as many as 20 pianists and the individual performers were required to make decisions regarding the length of the program” (Holmes, 2012, p. 108). The composing method of the

Winter Music is the same with *Music for Piano* series. In *Winter Music*, Cage “wherever he found an imperfection in the paper, he placed a solid note head, then overlaid the results with a staff that turned the note heads into notes. So far, this was nothing new” (Nicholls, 2002, p. 176). In this work Cage used the chance operations and indeterminacy. For the use of chance, “the chance element is found in the paper upon which the piece was originally notated”. Nevertheless, for the use of indeterminacy, Cage “developed a system of clefs which allowed for indeterminacy to develop on the level of the individual aggregates which are *Winter Music*’s sole material” (Iddon, 2013, p. 57). Pritchett (1996) wrote an explanation for the clef system as follows:

There are two clef signs for each chord. If the two clefs are identical (treble or bass), then all the notes of the chord are read in that clef. If the clefs differ, then some of the notes are read in one clef and some in the other. For chords with two notes (or clusters), one note is read in each clef. For chords with more than two notes, a pair of numbers above the chord gives the proportion of notes to be read in the different clef. The assignment of clefs to notes is not given by Cage, but is decided upon by the performer. (p. 110).

The score “may be used in whole or part by a pianist or shared by two to twenty to provide a program of an agreed-upon length”. The time, harmonics, “aggregates and individual notes”, overlappings, and interpenetrations are free (Kostelanetz, 1993, p. 57). In this work nearly every material can be varied. The performer can decide about the time, notes and harmony. Nevertheless, the most interesting part of this work is the single chords which are written on the twenty pages. Even if the indeterminacy and chance operations are used in this work (for the number of notes for each chord, and for their places), Cage wrote precise rules on the notation. He was clear that “each event should be played as a single attack” (Pritchett, 2000).

4.1.2.3 Concert for Piano and Orchestra (1957-58)

Concert for Piano and Orchestra was written for any solo or other combinations of piano, flute, clarinet, bassoon, trumpet, trombone, tuba, three violins, two violas, cello, double bass, and a conductor. It may also be performed by the ensembles as solo, duo, trio etc. At the time Cage was composing his *Concert for Piano and Orchestra* (1957-58), he was involved with the indeterminacy, and his composing means was chance operations. Cage dedicated his work to Elaine de Kooning (Cage, 1960). In this work, Cage gives the performer “the complete possibility to prepare his

own canvas of material” (Heintze, 1999, p. 82). The score for *Concert for Piano and Orchestra* “consists of separate score parts, complete within themselves. The piano part is 63 pages, with 84 different types of notation”. The performer, for each page of the piano part, determines “time horizontally for the conventionally (i.e. vertically) notated tones. Note-heads are not employed for occurrence or duration” (Vaughan, 1997, p. 61). Cage’s rule for the duration is given in his musical messages as follows:

...the time length of each system is free. Given a total performance time-length, the player must take a program that will fit it. The action of the conductor (when there is one) will alter the length of minutes (time units). Therefore, in the circumstances of having a conductor, the players program should be made so that he will be able to play faster or slower than he would with a standard chronometer. (Vaughan, 1997, p. 61)

“Notes are of three sizes referring ambiguously to duration or amplitude”. As in the *Winter Music*, Cage used imperfections in the paper and chance operations in *Concert for Piano and Orchestra* (Kostelanetz, 1993, p. 57). “The notation resembles traditional music notation that has been calligraphically altered” (Bernstein and Hatch, 2000, p. 127). In the piano part, all events are shown and indicated by letters and two-letter combinations (see figure 4.7).

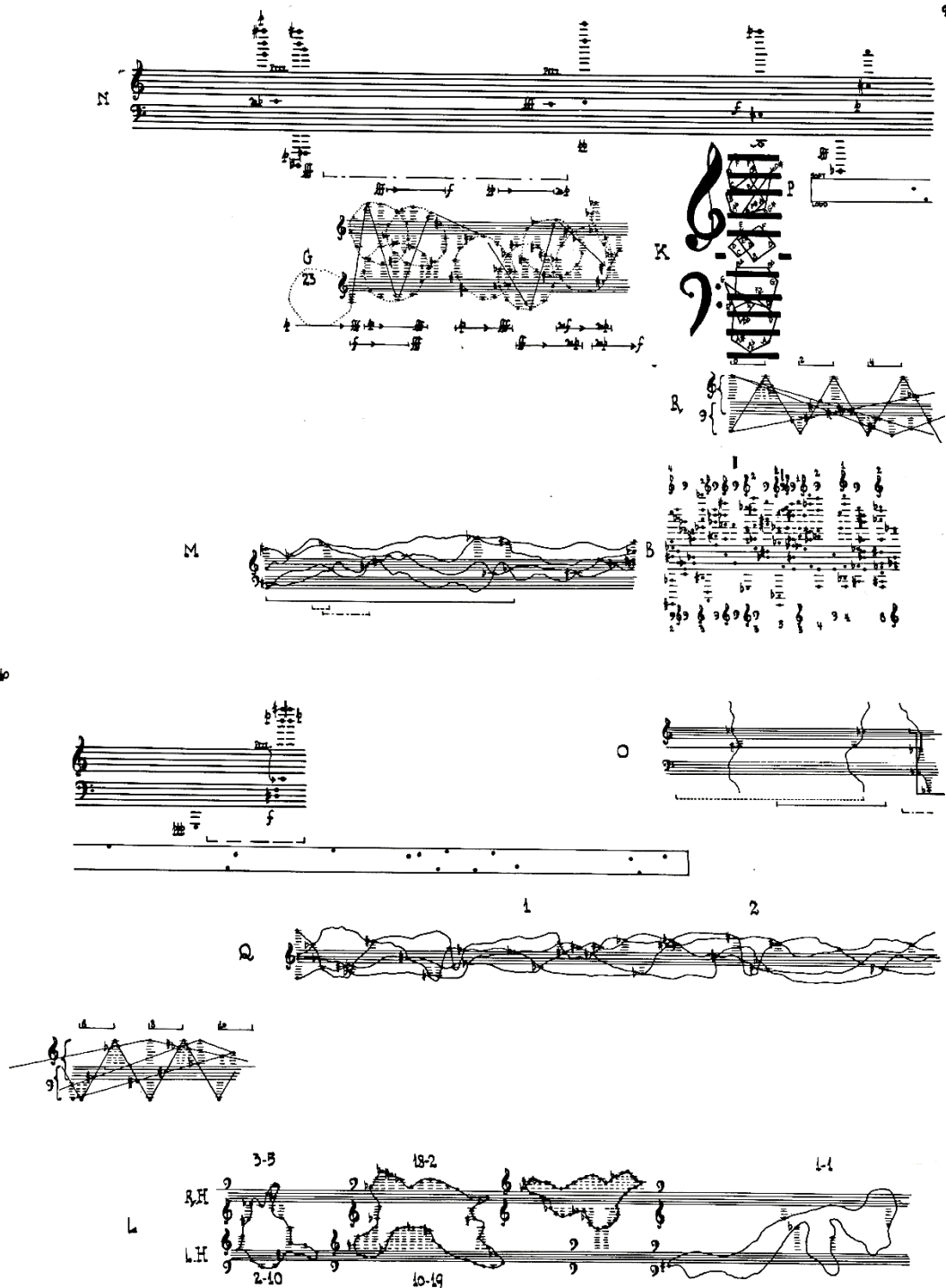


Figure 4.7 : John Cage, *Concert for Piano and Orchestra*, page 9-10. (Cage, 1960).

In this work, the performers developed their independence by choosing to play the whole or part materials, notations and elements. For instance, David Tudor, when he performed this piece, he used “tracks from the *Fontana Mix* (1958-59) as noise elements where these are notated” in the *Concert for Piano and Orchestra*. “He was free to make any continuity of his choice” (O’Rourke, 2013, p. 74). According to

Landy (1991), Cage's "independence of parts" and the "flexible instrumentation" is clearly "Zen-driven". In addition, his use of the I Ching and chance operations "is an Eastern reaction to Western technical advance" (p. 67).

4.1.2.4 Solo for Voice 1 (1958)

The work consists of two pages. Each page has eighth systems. The time-length is free. The performer may choose the amount of the material. "Notes are of three sizes" as in *Concert for Piano and Orchestra*. These notes ambiguously refer to "differences of amplitude or duration". The singer determines the vocal phrases, which indicates the position and places as semi-circles above notes. "Microtonal alterations" and "noises are included" (Kostelanetz, 1993, p. 59). "The text is a fragmentation and collage of German, French and English" (Dunn, 1962, p. 22). The composing means are chance operations, I Ching and imperfections in the paper as in *Concert for Piano and Orchestra* and *Winter Music* (Dunn, 1962, p. 31).

4.1.3 Compositions with the I Ching in the Sixties

4.1.3.1 Atlas Eclipticalis (1961-62)

Cage composed the piece "using a striking new setup. He laid bands of transparent paper over the celestial maps in a 1958 Czechoslovakian astronomical atlas, the *Atlas Eclipticalis*" (Silverman, 2012, p. 180). *Atlas Eclipticalis* has not a conventional score. It is a graphic score like Cage's *William's Mix* or *Fontana Mix*, but in *Atlas* there is a visual aesthetic onto musical paper (see figure 4.8). The Czech astronomer Antonín Bečvář produced the sky atlas for Cage's work *Atlas Eclipticalis* (see figure 5.9). The work "generated from maps of stars, with constellations transformed into patterns of notes" (Staines, 2010, p. 127). The compositional means for *Atlas Eclipticalis* "involved operations with the Y-King, the use of transparent templates placed on an astronomical atlas, and the final inking of notes from the positions of stars" (Birch, 1965, p. 58), and Cage used the I Ching to decide which staves had which clefs, and how they went to designate to various instrument in the orchestra. Thus, he produced 86 instrumental parts of combination. In addition, "the performer was given the option of playing this piece as a simultaneity with *Winter Music*" (Schlegel, 2008, p. 14). "An electronic version is made possible by use of

contact microphones with associated amplifiers and loudspeakers operated by an assistant to the conductor” (Kostelanetz, 1993, p. 61).

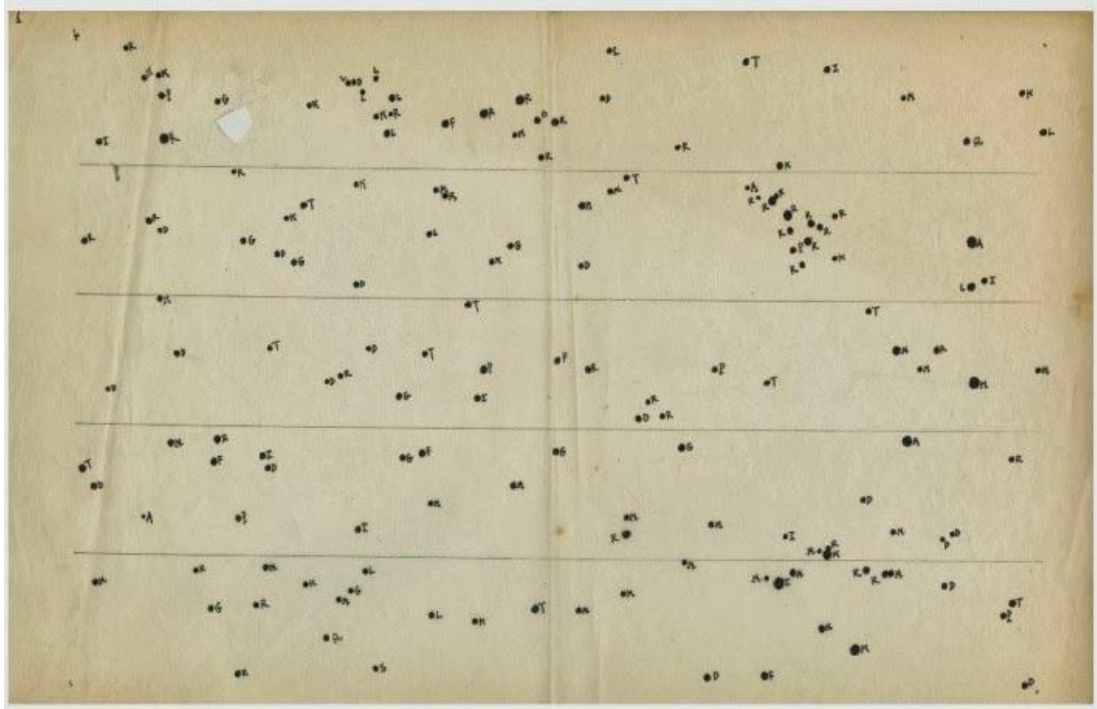


Figure 4.8 : John Cage’s Score (sketch) for *Atlas Eclipticalis* (Balmaceda, 2012).

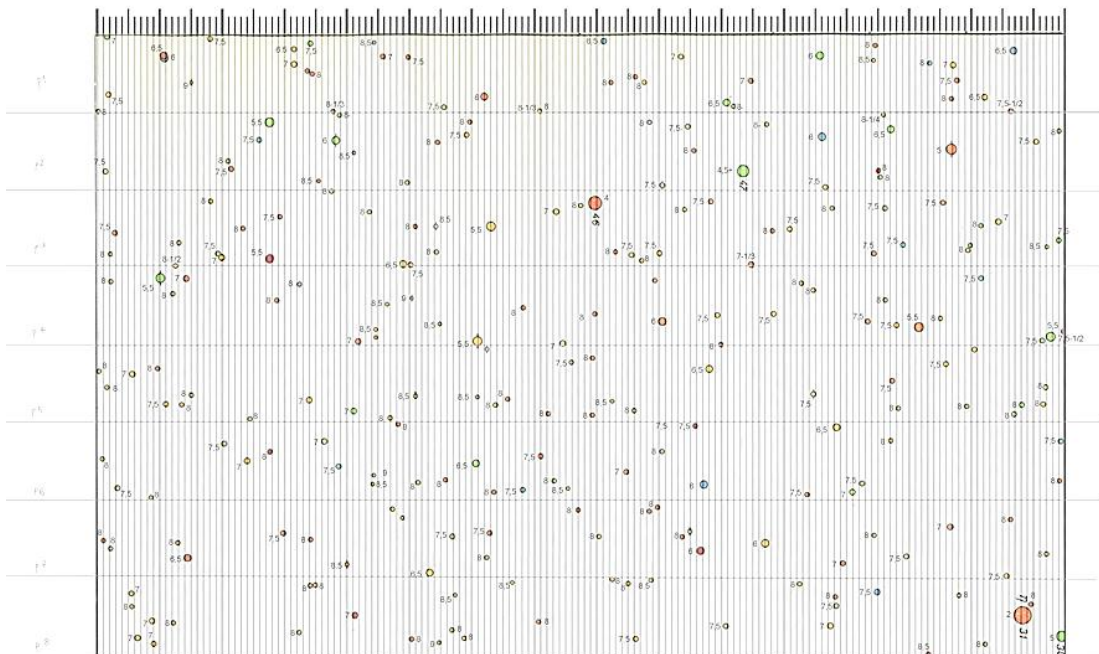


Figure 4.9 : Antonín Bečvář’s sky atlas for *Atlas Eclipticalis* (Balmaceda, 2012).

Thus, “instrumental sounds, which are for the most part soft, illuminated indeterminately of the piece which creates them” (Birch, 1965, p. 58). In *Atlas*

Eclipticalis, the players has to watch the conductor to play in time. Each part has arrows that equal to 0, 15, 30, 45, and 60 seconds on the clock. Each part has four pages and five systems. While time equals horizontal space, the pitch equals vertical space. The parts of the players connected by notated pitches and lines. Cage wrote certain rules about playing notes separately and making changes in sound quality. Even the pages of parts look like similar, each of them is different than the other. In *Atlas Eclipticalis*, unlike the traditional symphony orchestras, no one play the same notes, rather, each player has a different one (Lucier, 2012). “Tone production is never extraordinary. Percussion parts are a graph of the distribution in space of the instruments, as various and numerous as possible, chosen by the performer” (Kostelanetz, 1993, p. 62).

In February 1964, *New York Philharmonic-Symphony Orchestra* selected Cage’s *Atlas Eclipticalis* for their programme introducing an avant-garde composition to play for a large audience. But the performance was a fiasco (Taruskin, 2005). Staines (2010) wrote about the story of this concert as follows:

When Leonard Bernstein led a performance of Cage’s *Atlas Eclipticalis*- with his New York Philharmonic, mutiny broke out within his normally adoring orchestra. At issue: each musician was required to play off their own independent instrumental part. The positioning of Cage’s angular, scattering notes was technically challenging, and Bernstein had stressed the importance of practising each part to perfection. But then the players realized they were to be wired into a network of contact microphones that were to be switched on and off at random. The result? Their diligent practice could well be rendered inaudible. From a listener’s perspective, however, the gorgeously untidy counterpoint of so many instrumentalists colliding and dovetailing at random can be thrilling, provoking a liberated sound plasma that subjective compositional choice would have been unlikely to stumble across. Good thing, too, some might say. Therein lies Cage’s enigma. (p. 127)

4.1.3.2 Cheap Imitation (1969)

Cheap Imitation was composed by Cage in 1969 as a piece for solo piano. The work consists of the indeterminacy and the I Ching. It was actually emerged for Merce Cunningham’s dance company. Cage (1997) wrote the reason which made him write his *Cheap Imitation* as follows:

I would never have written *cheap imitation* had it not been necessary merce cunningham had long before made a choreography for the first movement of the *socrate* i had told him that i would continue my arrangement of two pianos of the *socrate* if he would continue the choreography in the late sixties

he informed me that he was going ahead with the choreography for the company so i went ahead with the arrangement for two pianos. (p. 394-395)

Merce Cunningham had choreographed *Second Hand* to work by Erik Satie, titled *Socrate*. But the publisher for “the Erik Satie Estate” denied the rights to the music “to give the Cunningham Company permission to use the music” (Slayton, 2014, p. 121). Thereupon, Cage composed “a solo piano piece keeping *Socrate*’s rhythmical structure, but changing the melody through chance operations” (Vaughan, 1997, p. 38). He had to write a piece “which had the same phraseology the same tempo” and he found a way “imitating the melody”. Moreover, he sometimes imitated the accompaniment “not as harmonic but as simply tones”. He also used the pedal, which was held down that gave “the effect of several things” (Cage, 1997, p. 396-397). Thus, the piece *Cheap Imitation* was created in 1969, and Merce Cunningham had used it for his dance *Second Hand* in 1970.

Cheap Imitation consists of three movements. These movements comprise of a single melodic line which tranformes to different modes, and the keeps the rhythmic structure of Satie’s *Socrate*. Cage’s technique for creating the vocal line is simply “a note-by-note rewriting, with random pitch alterations within a given set of whitish notes, of the vocal line of Satie’s *Socrate*” (Albright, 2000, p. 31). The pitches were determined by the I Ching. Cage, for each phrase, asked the following questions to decide about the melodic line and the line of accompaniment of Satie’s *Socrate*:

1. Which of the seven “white note” modes is to be used?
2. Beginning on which of the twelve chromatic notes?
3. Which note of given transposition is to be used? (Kostelanetz, 1993, p. 94).

In the first movement, Cage used each note independently within a phrase, thus every pitch had a new start (Nicholls, 2002). The note of given transposition was selected by the I Ching where the note is not repeated. In the second and third movement, the replacements of transpositions were used only at every half measure (Revill, 2014). According to Cage, although “the successive phrases often have chromatic relationships”, the *Cheap Imitation* is a modal work, which is formed in an “unusual” way (Kostelanetz, 2003, p. 83).

4.1.3.3 HPSCHD (1967-69)

HPSCHD was composed between 1967 and 1969. The title *HPSCHD* refers the word *harpsichord* in six letters, “the limits for titles of computer files at that time”. The premiere of *HPSCHD* was on 16 May 1969, in the Assembly Hall, at the University of Illinois, Urbana (Haskins, 2012, p. 98). The history of the composition began with a request which came to Cage by Lejaren Hiller, who was the head of the computer music department at the University. Hiller wanted Cage to write two works derived from computing technology and chance operations for the events of the University of Illinois’s one hundredth anniversary. Thereupon, Cage revealed his idea for *HPSCHD*. He said that he appreciated to University of Illinois, because if they did not give their hall, “it would have been difficult to find the equivalent in Europe” (Cage and Charles, 1981, p. 131). *HPSCHD* is a work for seven solo pieces for harpsichord and fifty-two tapes. It is involved “fifty-two tapes and all the divisions of the octave from five to fifty-six tones”. He choosed these tones because it was easier to produce with computer, and would have been difficult to obtain them without a computer. The first year in the process of *HPSCHD*, Cage spent his time programming the computer. He waited for an assistant who would program according to his instructions. But the assistant did not come and Hiller came forward to work on programming with Cage (Cage and Charles, 1981, p. 141-142). As a matter of fact, Mozart was a guide for all the proccess of this work. Hiller and Cage used a program called DICEGAME. They created “seven dissimilar twenty-minute solos for amplified harpsichords. All the solos take off from *Dice Game*(1787), a spoof attributed to Mozart”. In *HPSCHD*, each solo had a different character. In different solos, in some measures of *Dice Game*, “I Ching-determined” and “chance-selected excerpts” were used from “such works as Beethoven’s *Appassionata*, Chopin prelude, and Schumann’s *Carnaval*(Silverman, 2012, p. 239). In addition, Gottschalk’s *The Banjo*, Ives’ *Three-Page Sonata*, Schoenberg’s *Opus 11, No.1*, Cage’s *Winter Music* and an early piano sonata by Hiller” was presented (Hamm, p. 1995, p. 92-93).

In *HPSCHD*, such matters as pitch and duration were determined by the I Ching (Silverman, 2012). Cage said that he begun to use the I Ching “on a very large scale” in his *HPSCHD*. I Ching has been computerized and he no longer tossed coins himself. He could “picture working on a large number of hexagrams at once” (Cage

and Charles, 1981, p. 143). For the computer program of *HPSCHD*, it was needed two decays. But the second decay was complicated by its own curve. So, Cage and Hiller programmed the synchronization of the attacks of the harpsichord sound. Since it was impossible “to get the computer to consistently coordinate the two acts”, and it would take amount of time as well as have been very expensive, they decided to “forego the second attack” and to use only the “simple curve of the first decay”. Then, they enrolled into the program one of the I Ching charts. But they had to ignore the charts because “the curve would only fit into a part of the chart” and the I Ching “gave other numbers in other parts of that chart”. Nevertheless, the number which appears at the bottom of the diagram would effect the variations (Cage and Charles, 1981, p. 142). In an interview with Larry Austin, Cage explains how he used the I Ching for his *HPSCHD* as follows:

...having observed large chordal/melodic steps, the diatonic and chromatic, even smaller steps were made, which would be microtonal with respect to each one of the tones in any one of these octaves. This arose from the I Ching which uses the number “sixty-four” and from the binary function which is so implicit in the computer—zero or one. Multiplying sixty-four by two, you would get, for each one of these tones, one hundred twenty-nine possible pitches. We have very small steps—microtonal, small steps—chromatic, larger steps—diatonic, then, the very large steps consisting of leaps, in all the divisions from five to fifty-six. (Austin and Kahn, 2011, p. 147)

In the premiere of the work, David Tudor, Antoinette Vischer, William Brooks, Ronald Peters, Yūji Takahashi, Neely Bruce and Philip Corner played harpsichords. For this performance, 7 pre-amplifiers, 208 computer-generated tapes, 52 projectors, 64 slide projectors, 8 movie projectors, 6,400 slides, 40 movies, a 340-foot circular screen and 11 by 40 foot rectangular screens were used, and the performance lasted five hours (Revill, 2014). According to Kostelanetz (2001), “*HPSCHD* was an incomparably abundant visual/aural uninflected environment, really the most extravagant of its kind ever presented” (p. 292).

4.1.4 Compositions with the I Ching in the Seventies

4.1.4.1 Sixty-two Mesostics Re Merce Cunningham (1971)

Sixty-two Mesostics Re Merce Cunningham was composed in 1971, for solo amplified voice. Mesostic “means row down the middle” (Kostelanetz, 1993, p. 97). Cage said that his concern with mesostics is about the language. According to him, if we can change our language, our thinking also would change, because the thing

which controls our thinking is the language (Kostelanetz, 2003). Cage spoke about his concern with the mesostics as follows:

I take a name as a kind of discipline and the first line must have the first letter of the name and must not have the second letter of the name. That must appear in the second line. And so I am able to do that either by having syntactical ideas, as in the case of the mesostics on the name of Duchamp". (Kostelanetz, 2003, p. 154)

He also created his mesostics by using chance operations as in the case of the *Sixty-two Mesostics Re Merce Cunningham*. "In his mesostic (or medial acrostic) method of systematic-chance text generation, Cage offers a comparable intervention in, and disturbance of, a preexistent textuality" (McCaffery, 2001, p. 219). Perloff and Junkerman (1994) conceived that "Cage's mesostics show us something philosophical about the nature of human dwelling". His mesostics "aim to soften the brutality of the ego, to silence or deflate its claims to total conceptual and political control" (p. 202). The philosophical character of Cage's mesostics "do not simply show us something about the conditions of human freedom and dwelling, they also reveal something about the nature of human identity. This is made clear through the relation between Cage's mesostics and their source texts" (Perloff and Junkerman, 1994, p. 202). Cage's *Mureau*, *Empty Words*, some parts of *M: Writings '67-'72*, *X: Writings '79-'82* and *I-VI* were written with texts entailed his mesostics. An example of Cage's mesostics for James Joyce⁶⁵ is given below (see figure 4.10).

⁶⁵ James Joyce: (February 2, 1882 - January 13, 1941) was an Irish author who "was the international modernist *par excellence* of his day" (Foster, 2006, p. 133). He was one of the "influential literary authors often receive a great deal of critical and causal attention" (Matthews, 2009, p. 97).

4.1.4.2 Cheap Imitation (orchestra version 1972)

After his *Cheap Imitation* (1969) for solo piano, Cage decided to enlarge the work, because he was already commissioned to do *Cheap Imitation* by the Koussevitsky Foundation. They had been asking Cage to write an orchestral work for them. After he was refused the right to arrange Erik Satie's *Socrate* for two pianos, he decided to write a work for orchestra "which would somehow be rhythmically identical with *Socrate*" (Cage and Charles, 1981, p. 179). It took three years, but finally, in 1972 he finished the orchestral version of his original *Cheap Imitation*. It was a work "for an orchestra between twenty-four and ninety-five players". The orchestral version was emerged by using the chance operations (Nicholls, 2007, p. 90). According to Cage's instruction, "those who play are to seat themselves together in any unconventional way: not according to instrumental categories" (Kostelanetz, 1993, p. 95). The orchestra version of the *Cheap Imitation* is for 24-95 parts, which could be played with or without conductor. Cage did not mean a conductor to direct the orchestra. He or she could be only a coach during the rehearsals (Revill, 2014).

This time, Cage used the I Ching to get answers for these following questions:

1. Which orchestra instruments could play the notes of the phrase?
2. How many instruments should play?
3. Which instruments should play?
3. How many notes of the phrase should be played?
4. Which phrases should be played?
5. How these phrases should be articulated? (Revill, 2014).
6. *For each duration longer than the unit within a phrase*: What quantity of the total duration is to be held?
7. *For single notes and phrase endings*: Is a note left quickly (.), held full length (-), or held slightly more than full length ? (Kostelanetz, 1993, p. 94).

Cage (1976), in the foreword of his book *M: Writings '67-'72* wrote that he had provided to open the ears of the orchestra musicians to play not only for earning money, but also to enable them to make music. In my opinion, Cage ultimately understood that the approach of the orchestra musicians was the same for every kind

of music. They did not want to learn anything about new techniques or styles, thus, there was no difference between Cage's music and works of any other composer.

4.1.4.3 Etudes Australes I, II and VIII (1974-75)

Etudes Australes is a work consisted of thirty-two etudes, divided into four books. Each book has eight etudes. Each of them takes nearly eight minutes, but actually there is no duration time which is given by Cage. Moreover, Cage did not give neither tempo and dynamics, nor pedal indications. Thus, the performer can shape both of them according to his/her will and pleasure. In the preface of the score it was written that "in some of the later etudes, notes to be played could not be clearly written in the allotted space, a beam with stems gives the rhythm and a capital letter" as A, B, C. These letters refer to a loose-leaf Appendix (see figure 4.11), "where the notes to be played are given" (Cage, 1975).

Appendix



Figure 4.11 : Appendix of Cage's *Etudes Australes* (Cage, 1975).

The title of *Etudes Australes* comes from *Atlas Australis*, “a book of star maps printed in six colors (blue, green, orange, red, yellow, violet), published in Czechoslovakia” (Nicholls, 2007, p. 94). The sky atlas was acquired by Czech astronomer Antonín Bečvář, in Prague, in 1964 (Vogels, 2007). Cage with the help

of these atlas, translated the maps of the stars into musical notation. He also benefited from the I Ching not as the means of the texts (wisdom), but as a means of chance operations related to 64 numbers of the hexagrams. When Cage wrote his *Sonatas and Interludes*, he was thinking the performer would be Maro Ajemian. For his *Music of Changes*, David Tudor was in his mind. And without Grete Sultan, he said, he would not have proceeded on this project (Kostelanetz, 1993). After forty years, they had first met, Cage began to compose these etudes for Grete Sultan. At the beginning in the process of the work, Cage decided to see Sultan at the piano, because he wanted to compose a duet for her two hands, each playing its part independently. He went home and started to study on listing all the intervals and combinations for a single hand (Revill, 2014), which could be played by a virtuoso pianist as Grete Sultan. Cage wrote the piece on four staves. The upper two were written for the right hand, and the lower two were written for the left hand (see figure 4.12). According to this, each hand should have used its area and should not assist the other hand.

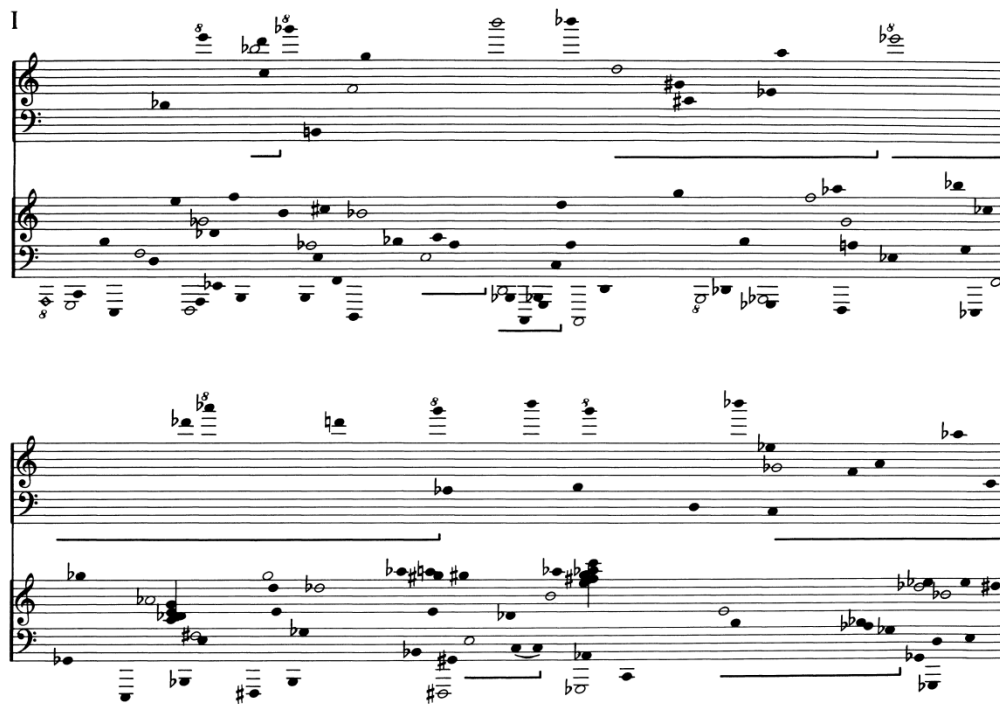


Figure 4.12 : Excerpt from Etudes Australes, Book I, No.1. (Cage, 1975).

Cage soon figured out that a hand could play “546 five-note aggregates and 520 four-note aggregates” (Silverman, 2012, p. 279). Then, he asked I Ching “which of these

pitches were to remain single, and which should become parts of aggregates” (Baofu, 2012, p. 245). *Etudes Australes* was composed by “laying a transparent grid over a set of star maps” (Silverman, 2012, p. 279). Cage asked to the I Ching which stars he was to trace and how many (Kostelanetz, 1993). Cage’s color charts is given in a table below (Table 4.2).

Table 4.2 : Cage’s color charts for *Etudes Australes*.

Numbers 1-9: Blue and green
Numbers 10-18: Orange and red
Numbers 19-27: Yellow and violet
Numbers 28-37: Blue, green, orange and red
Numbers 38-46: Blue, green, yellow, violet
Numbers 47-55: Orange, red, yellow, violet
Numbers 56-64: All stars

Through the use of the I Ching, Cage translated “the points in space into musical notation” (Kostelanetz, 1993, p. 99), and transformed these tones to octaves for both the right and left hand. The left hand would be played “from the lowest A to the C above the treble clef” and the right hand would be extended “from the highest C to the A of the first space of the bass clef” (Kostelanetz, 1993, p. 101). These parts were separated by the help of the star maps and the I Ching. According to Cage, these maps, stars, colors techniques determined by the I Ching “permitted the writing of a music which was not based on harmony, but it permitted harmonies to enter into such a nonharmonic music” (Kostelanetz, 2003, p. 91). Cage’s virtuoso work *Etudes Australes*, besides Grete Sultan, was recorded by Stefan Schleiermacher, Sabine Liebner, and Claudio Crismani.

4.1.4.4 Renga with Apartment House 1776 (1975-76)

Renga was written by Cage, to be played either with *Apartment House 1776* or independently, or with some other music (live or recorded) appropriate to

another occasion (Cage, 1976). Renga is a Japanese poetic structure as haiku and waka. It was most often formed by a group of poets. “The shortest form of *renga*” says Cage, “is 36 groups of 5-7-5-7-7 syllables” (Kostelanetz, 2003, p. 88). Thus, the poetic structure of Cage’s *Renga* is 5-7-5-7-7. Each person writes a line, then it passes to another person to write the second line, and the other person writes the third, etc. (Kostelanetz, 1993). Renga has a system of graphic notation (see figure 4.13). This system uses “tracings of the drawings in Henry David Thoreau’s journals. It consists of twelve pages and 361 parts for 78 musicians”(Wolmer and Shaw, 1977, p. 1), for any instrument or voices.

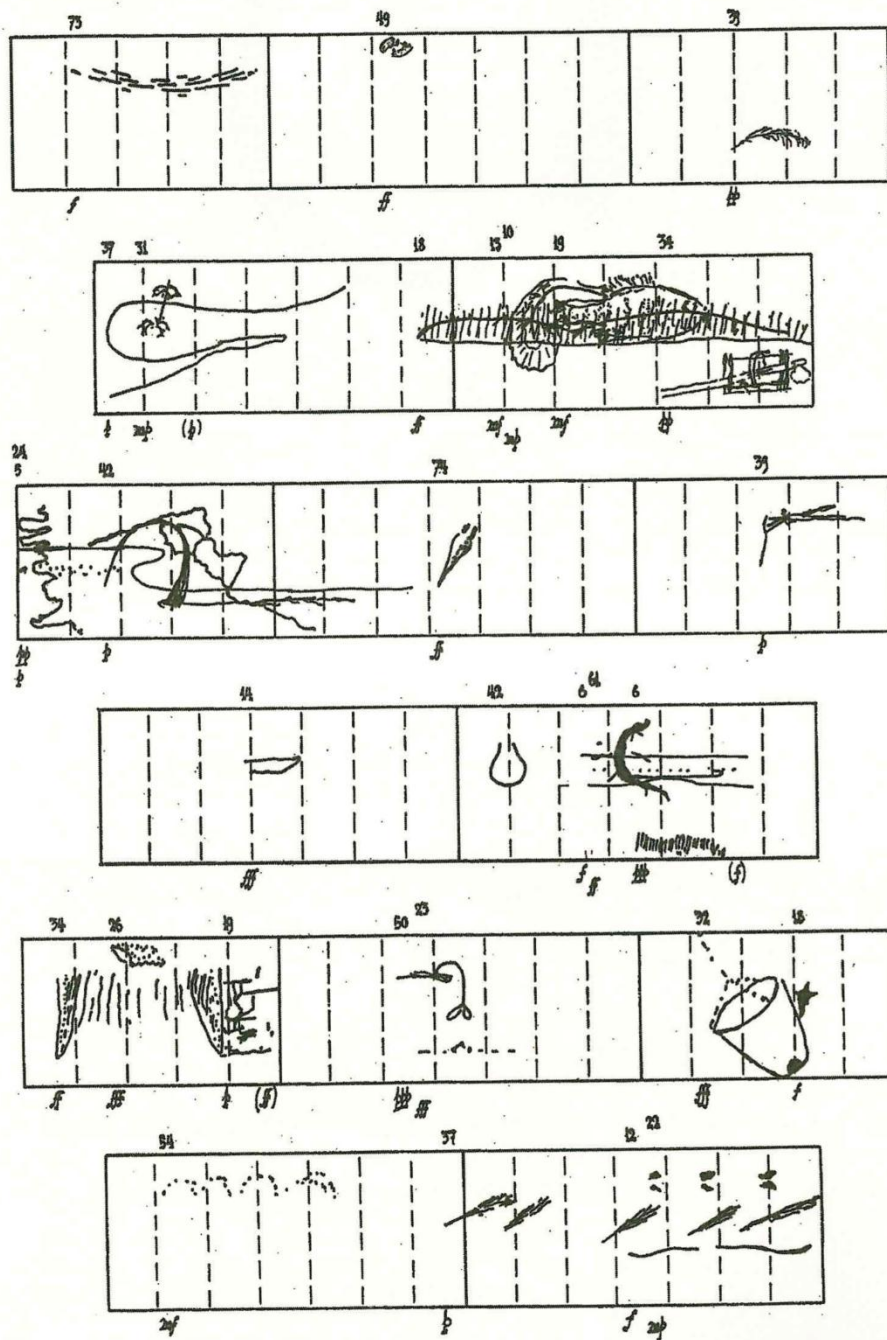


Figure 4.13 : Graphic notation of Renga (Cage, 1976).

Fader (2012), wrote about Cage's excitement on Thoreau's drawings for *Renga* as follows:

John Cage perched large reproductions of Henry David Thoreau drawings on a table in his apartment. He was adding his "finishing touches" to *Renga*, a composition that utilized Thoreau's art.

The first performance of *Renga* was to be held that autumn. As John surveyed the manuscript, I imagined that he was communing with Thoreau, true to the dialogical nature of a traditional Japanese renga poem. After peering into one page for several minutes, John broke into a big smile, then a laugh. He joyfully called out, “I can’t wait to hear how this will sound!”. (p. iii)

The drawings “have been taken apart so that they read from left to right, as music conventionally does” (Kostelanetz, 2003, p. 87). These drawing selections from *Thoreau’s Journal* and his arrangements of these drawings according to the chance operations and I Ching made Cage gain a successful experiment in his *Renga with Apartment House 1776*. Cage (1990) wrote in his *Autobiographical Statement* that “Rengas (a mix of a plurality of source mesostics), autokus, mesostics limited to the words of the mesostic itself, and ‘globally,’ letting the words come from here and there through chance operations in a source text” (p. 6). Cage talked about the connection between Thoreau and the I Ching for himself as follows:

It may seem to some that through the use of chance operations, I run counter to the spirit of Thoreau... The fifth paragraph of *Walden* speaks against blind obedience to a blundering oracle. However, chance operations are not mysterious sources of “the right answers.” They are a means of locating single one among a multiplicity of answers, and, at the same time, of freeing, the ego from its taste and memory, its concern for profit and power, of silencing the ego so that the rest of the world has a chance to enter into the ego’s own experience whether that be outside or inside. (Retallack, 1996, p. xxviii)

The questions such as which of Thoreau’s drawings should be used, how should be their sequence, appearance, superimposition, and placement were asked to the I Ching. “The number of instruments playing a particular drawing and how loudly the drawings are to be played were also *I Ching* chance-determined” (Kostelanetz, 1993, p. 103). To define the suggestions from one instrument to another, or from a voice to another, Cage used the colors. These colors were used also to differ the way of playing or singing.

These two compositions *Renga with Apartment House 1776* were written “on a joint commission by the orchestras of Boston, Chicago, Los Angeles, New York, and Philadelphia, supported by a grant from the National Endowment for the Arts in honor of the Bicentennial” (Wolmer and Shaw, 1977, p. 2). The New York Times wrote that *Apartment House 1776* “is meant to evoke the cultures and traditions present at the birth of independence through disparate musical statements and styles,

mingled as if overheard from open windows in a modern apartment building” (Smith, 2013). *Apartment House 1776* consisted of twenty-four performers of the orchestra and four solo vocalists. These twenty-four musicians create four quartets. Each quartet has a time-beater. And there are four soloists who play drum, a string instrument, flute, or keyboard. Cage, with these two pieces tried to make us see “rather than one thing being done, two things are being done” (Kostelanetz, 2003, p. 87). He used a variety of materials such as “drum solos from an eighteenth-century collection, a few short tunes of the period, and an array of new music” which he called *harmonies*. He used some eighteenth-century composer’s hymns as a source material (Haskins, 2012, p. 118). Some of these composers are William Billings, Jacob French, and Andrew Low (Revill, 2014). Cage also benefited from the deductions which came from the time of the American Revolution. Cage to decide which musics from the past could be used and varied, counsulted the I Ching. Each quartet and each soloist may prepare a program from the materials. For a single performance, the musicians may choose one of these materials; fourty-four *Harmonies*, fourteen *Tunes*, and two *Imitations* (Kostelanetz, 1993). In addition, the four singers represent the sacred music of four national traditions. These are; Native American, African American, Sephardic Jew and Anglo-American musics (Haskins, 2012). *Apartment House 1776* consisted of sixty-four pieces which is equal to the hexagrams of the I Ching. It is not possible of being sure, but these sixty-four pieces could be arranged according to the numbers of the hexagrams.

4.1.4.5 Freeman Etudes (1977-90)

Cage’s *Freeman Etudes* were written for solo violin. The work is a set of four books, consisted of thirty-two etudes. Each book contains eight etudes. Cage composed these etudes after a request came by Betty Freeman⁶⁶. This request was for violinist Paul Zukofsky. He was in collaboration with Cage to compose *Freeman Etudes*. These etudes were written by shifting Cage’s “responsibility from making choises to asking questions”. The questions were asked to the I Ching (Kostelanetz, 1993, p.

⁶⁶ Betty Freeman: (1921-2009). She was an “influential American patron of the arts who initially befriended and collected abstract expressionists, pop artists, and David Hockney”. She supported Cage for many years (Dickinson, 2006, p. 177).

107). In the case of the violin etudes, Cage used the same star maps as he used in his *Atlas Eclipticalis* and *Etudes Australes*. The maps have six different colors. These are blue, green, orange, yellow, red and violet. He combined the colors in pairs, or in three, thus he obtained seven different densities (Kostelanetz, 2003). In the process of this work, besides using the I Ching, Cage was asking to Paul Zukofsky about the subsequent pitches for chords. The questions were, for instance, “If this particular note is played on this particular string, what are all the possible pitches that can be played on this other string?”. Zukofsky’s answers were also depended on chance operations to determine the second note, then the third note, etc. “Each note of each etude is thus the product of hundreds of different chance operations” (Pritchett, 1994). Cage, to determine how to use the stars and maps asked to the I Ching the following questions:

1. Which of those seven possibilities (blue/green, red/orange, yellow/violet, red/orange, and blue/green with red/orange with yellow/violet) am I dealing with?
2. How many stars am I to trace?
3. What next am I to do?(Kostelanetz, 2003, p. 98).

To compose for every aspect of the note, Cage was consulting I Ching in order to be replied about the following questions:

1. Will it be *détaché* or *legato*?
2. Will it posses any unusual characteristics?
3. If so, what kind? Unusual timbre or bowing? A pitch slide? A chord?
4. An overlapping of another note?
5. If this is to be a pizzicato note?
6. Will it be normal, done with the fingernail, *snapped*, or *damped*?
7. If damped, will it be damped with the finger or fingernail? (Pritchett, 1994).

As in the *Etudes Australes* for piano solo, Cage wanted to make the music “as difficult as possible so that a performance would show that the impossible is not impossible”, and he wrote *Freeman Etudes*. In the etudes from 17 to 32, there are too many notes to play. Since for many years Cage has thought, “they would have to be synthesized” which he did not want to do, the work remained unfinished (Cage,

1990, p. 7). Besides that, he thought the etudes were virtually impossible to play, because in 1981, Paul Zukofsky “told him that the latest of his *Freeman Etudes* was unplayable” (Haskins, 2012, p. 149). Because of these arguments, Cage abandoned the work until he heard the London-born violinist, Irvine Arditti performed Cage’s first sixteen etudes of *Freeman Etudes*, in 1988 (Silverman, 2012). After the performance of the first sixteen etudes, he asked him why he played so fast. Arditti answered “That’s what you say in the preface: play as fast as possible”. As a result of this conversation, Cage decided to finish his work. Moreover, for the places where there are too many notes, he decided to write, “Play as many as possible” (Cage, 1990, p. 7).

4.1.4.6 Etudes Boreales for Cello Solo and for Piano Solo I-IV (1978)

Cage’s work *Etudes Boreales for Cello Solo and for Piano Solo I-IV* was composed with the same method, which Cage employed in his *Atlas Eclipticalis* (1961-62), *Etudes Australes I, II, and VIII* (1974), and *Freeman Etudes* (1977-1990). He used the star charts and the I Ching to compose these etudes. In *Atlas Eclipticalis*, he applied the map of sun, in *Etudes Australes I, II, and VIII* the map of southern sky (*Atlas Australis*) and in his *Etudes Boreales for Cello Solo and for Piano Solo I-IV* the map of northern (*Borealis*). The music was actually written at request of Jack and Jeanne Kirstein, but they found the pieces unplayable (Nicholls, 2007). After that, it was recorded by Frances-Marie Uitti⁶⁷ and Michael Pugliese⁶⁸ (Kostelanetz, 1993). Cage did not write a score for the two solos of *Etudes Boreales*. He organized the work in three versions: 1. for solo piano, 2. for solo cello, 3. duo for cello and piano. The score for piano was actually written for percussion, because Cage needed “the experience of a percussionist” (Kostelanetz, 1993, p. 106). The piano solo may be performed with or without cello solo. For the pianists it is a quite difficult part to play. Cage required the pianist employ not only the keys, but also the strings and the

⁶⁷ Frances-Marie Uitti: Composer and performer, who “pioneered a revolutionary dimension to the cello by transforming it for the first ever into a polyphonic instrument capable of sustained chordal [two, three, and four-part]” (Ehrlich, LaBelle and Vitiello, 2003, p. 328).

⁶⁸ Michael Pugliese: (1956-1997). He was a percussionist, who worked with John Cage and Merce Cunningham. He studied with Jan Williams, Morton Feldman and Yvar Mikhashoff and Nils Vigeland (Url-4).

frame of the piano. On the other hand, in the cello score, the pitch, duration, dynamics and colors were written. The score for cello, according to Stowell (1999), “demand the utmost mastery of cello technique, particularly the ability to jump accurately to any point on the fingerboard and beyond (see figure 4.14). They are to be played without vibrato, magnifying the difficulty of leaping and allowing no possibility of correcting undesired inaccuracies” (p. 221).

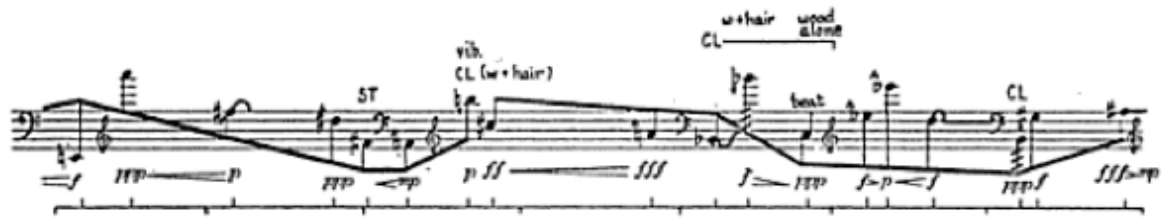


Figure 4.14 : Excerpt from John Cage’s *Etudes Boreales* (Stowell, 1999, p. 221).

In a video which was recorded in 2009, London based pianist and conductor Mark Knop performed Cage’s *Etudes Boreales* for solo piano. He employed every component of the piano by hitting and tapping it. Using mallets on the strings to strike and rub them creates muted and normal sounds. He made use of the sustain pedal to obtain long voices, and placed his mallets inside and outside the frame of the piano. The sounds, which come over, are actually particular effects more than sounds.

4.1.5 Compositions with the I Ching in the Eighties

4.1.5.1 Ryoan-ji: Solos for Oboe, Flute, Contrabass, Voice, Trombon with Percussion or Orchestral Obbligato (1983-85)

The term *Ryoan-ji* comes from a garden, which is attached to a Zen temple, in Kyoto-Japan. In this *Ryoan-ji Garden* there are 15 rocks placed on a raked sand. Cage titles his work as a reference to this garden in Kyoto. The garden “appeared around the year 1500 at Ryoan-ji. No one knows where it came from, “but a contemporary drawing shows that by the turn of the century the buildings were up again and a rock garden had been added, surrounded by a low wall near the largest building” (Mosher, 1964, p. 144). Sakamoto (2000) mentioned the stones of the Ryoanji as follows:

The number fifteen is considered the perfect number because the moon takes fifteen days to become full. Additionally, the stones are arranged from east to west, or left to right, and divided into five groups of 5, 2, 3, 2, 3 in number. The groups can be combined to form the series 7-5-3 which Japanese think to be propitious. (p. 48)

In 1982, Cage was asked to “design a cover for Pierre Lartigue’s translation into French” of his *Mushroom Book*. This book would be a part of Pierre Lartigue’s “series of fifteen books called Editions Ryoanji” (Kostelanetz, 1993, p. 134-135). For the cover design of this book, “Cage found the position of each individual rock with a light drypoint line, repeating this over and over, each time finding a new position” by consulting his I Ching tables of chance operations (Breuer, Fine and Nash, 1997, p. 181). Later, on January 2, 1983, Cage arrived to Crown Point Press, bringing a bag of stones. Using some packing materials such as “cotton batting, jute pads, felt and foam” Cage realized an idea which is called *HV*; Horizontal and Vertical prints. He started to work with this horizontal and vertical orientation by using fifteen stones from sixteen, which is the number in *Ryoanji* garden (see figure 4.15). “He located each stone individually on a single test plate using his system of coordinates on a grid, but keeping a horizontal/vertical axis” (Brown, 2000, p. 87-89). That summer, Cage kept work on his series of drawings.

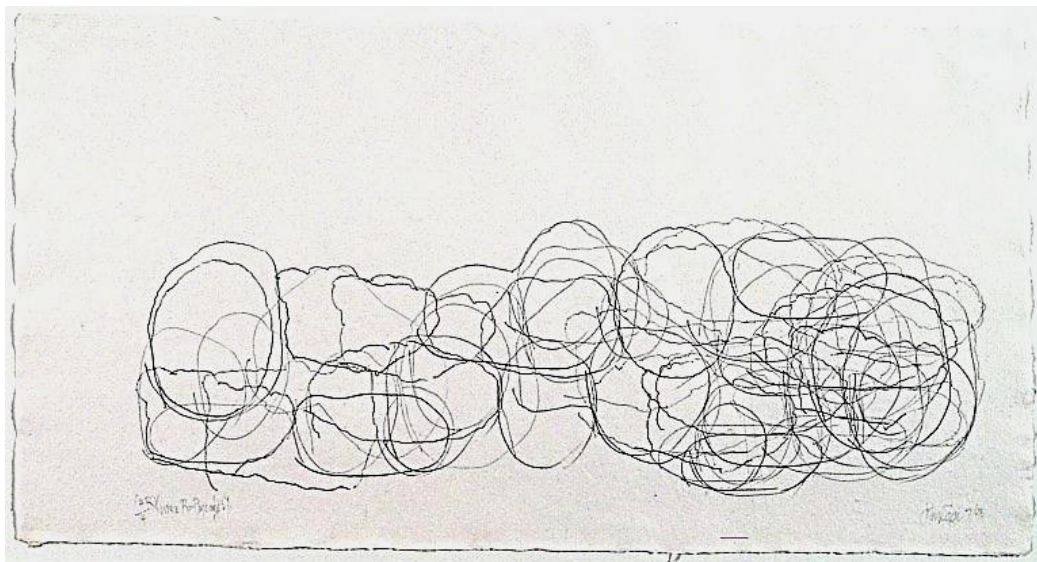


Figure 4.15 : John Cage, Where R=Ryoanji (4R)4 7-83, Pencil on paper, 1983 (Brown, 2000, p. 94).

At the same year, an oboist James Ostryniec, asked Cage to write a piece for him, and came bringing his oboe and some materials about playing it. Cage decided to write music for him, when he saw “one of the books began with division of the

octave not into seven or twelve tones but into twenty-four” (Kostelanetz, 1993, p. 135). Later he composed a series of music on Ryoanji. He wrote for oboe, double bass, percussion, flute, trombone and an unfinished piece for cello. The solos are accompanied by percussion, orchestral obligato which contains twenty-member, or ad libitum with other pieces of the same title. Except the solo part for voice, each solo consisted of eight songs, and each of them comprised two pages, which contains two rectangular systems. The duration and the range of the work is indeterminate. There is no equipment. The extended techniques are used such as non-standard glissandi, microtones, and indeterminacy (Adams, 2008).

The oboe part was resulted as a first part of Ryoanji. The shape of stones outlined the shape of composition and “curved lines drawn between pitches on staves”. The curves on the score (see figure 4.16) should be played as glissandi (Sakamoto, 2000, p. 50).

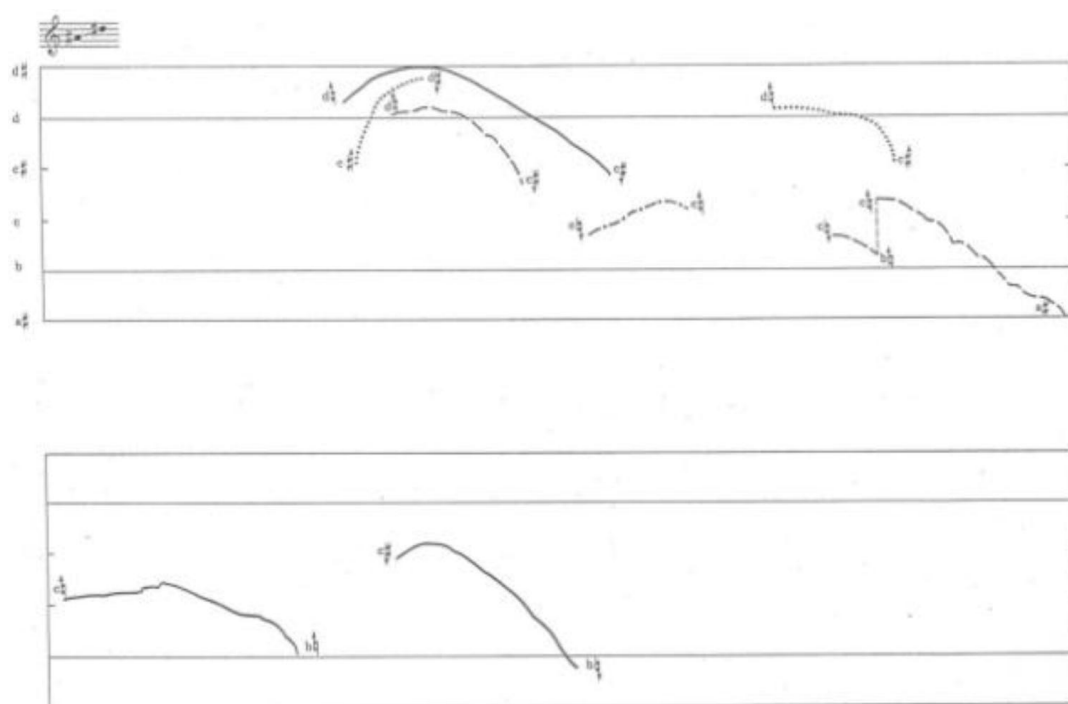


Figure 4.16 : John Cage, Ryoanji for Oboe, page 8 (Cage, 1983).

According to Fowler (2005), Cage recomposed the garden as a musical score. “Using a collection of his own fifteen stones, he traced around their edges as a way to generate a melodic slide between chance-derived pitches” (p. 35). He employed four different lines: a straight (unbroken) line, a dashed line, a dotted and dashed line and a dotted line (Retallack, 1996, p. 240). In the score, there are some places which the

contours overlap, “thus, rendering them impossible to play on such melody instruments. In these cases, tape recordings are used to allow a single performer to play duets or trios” (Pritchett, 1996, p. 189). For the percussion part (see figure 4.17), Cage (1983) gave an explanation in the score as follows:

At least two only slightly resonant instruments of different material (wood and metal, not metal and metal) are to be played in unison. The playing begins anywhere about two measures before the instrumentalist or vocalist enters, continuing during silences between two songs or pieces, and ending about two measures after the instrument or voice has stopped. These sounds are the "raked sand" of the garden. They should be played quietly but not as background. They should even be imperceptibly in the foreground. They should have some life (slight changes of imperceptible dynamics) as though the light on them is changing. (p. 1)

In his *Tokyo Lecture and Three Mesostics* Cage mentioned about *Ryoanji*. He described that his attention to slow tempi began with the accompaniment for the solos of *Ryoanji*. He said, “what I did was, given a metronome reading of 60, to establish a series of measures having twelve to fifteen beats, only five of which would be heard” (Kostelanetz, 1993, p. 181). Like in the percussion part, the orchestra parts are a series of quarter notes. Each of the musicians in the orchestra choose a single sound to use throughout the performance.

RYOANJI

JOHN CAGE

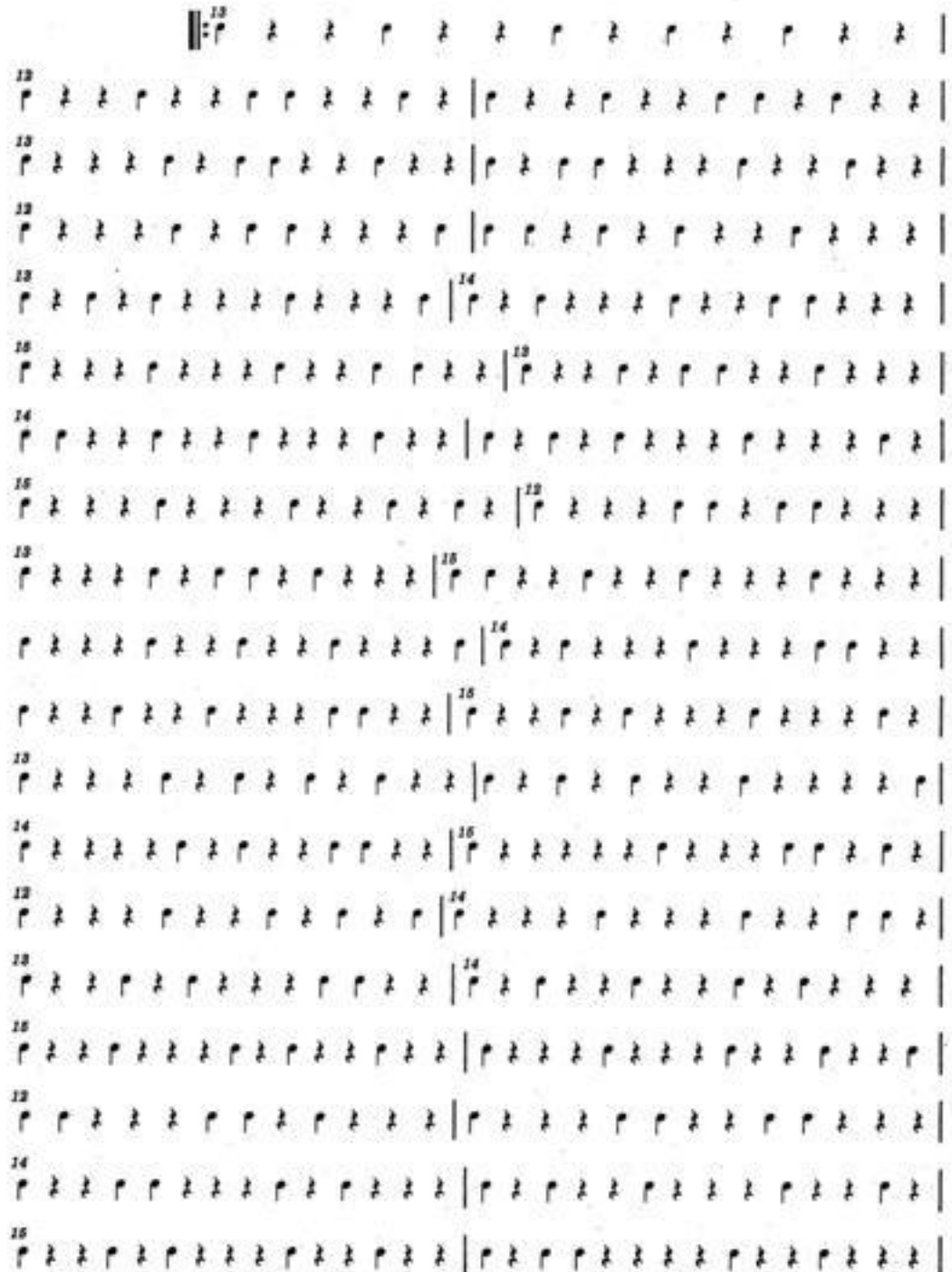


Figure 4.17 : John Cage, Ryoanji, percussion part, page 1 (Cage, 1983).

4.1.5.2 Etcetera 2 (1985)

In 1973, Cage composed his *Etcetera 1* “for the ballet by Merce Cunningham *Un Jour on Deux*”. Then, in 1985 *Etcetera 2* was composed “for a full orchestra divided into four” (Kostelanetz, 1993, p. 98). These two pieces are accompanied by “a tape recording of the sounds in the environment” where these musics are written. In *Etcetera 1*, Cage was living in the country (Kostelanetz, 2003, p. 170), in *Etcetera 2*, he was living in New York City. When Cage have not yet finished this work, in an interview it was asked his ideas on the orchestral piece *Etcetera 2*, and Cage replied as follows:

Etcetera 2 is going to begin with the musicians all conducted, and there are going to be four conductors. And each pair of musicians will have one stand with the music on it. It is very curious. That took me a long time to figure out. It’s important that there be two, because when one of them leaves the conducted situation to go to an unconducted melodic situation, he needs to know, when he returns, where everybody is. And the one who is sitting there can tell him. (Kostelanetz, 2003, p. 135)

On 5 December 1986, John Cage was asked to give a lecture in Tokyo. Three days later, on 8 December, a concert was organized with the works chosen by Cage. The program was *Exercises 24 & 25* by Christian Wolf, *Socrate* by Erik Satie, *Symphony Op.21* by Anton Webern, and *Etcetera 2 / 4 Orchestras* by John Cage. In his *Tokyo Lecture and Three Mesostics*, Cage talked about his orchestral work *Etcetera 2*. He said, for instance, for the orchestral parts of *Etcetera 2 / 4 Orchestras* he “would make a new section on the word Experience or Nonunderstanding”. Because he became “devoted to tempi so slow that they cannot be heard or felt as tempi” (Cage, 1988, p. 8). He decided to go further and increased the measures lengths “from twelve to fifteen beats” and “from twenty-seven to thirty-six beats”. The number 5 was the number of beats and “would be heard in a single measure”. He also changed “the space between single beats” (Cage, 1988, p. 10). “The solos in *Etcetera 2* are indeterminately written. They are for one to five unspecified tones together with one short changing or not changing auxiliary tone, sixteen of each were written. There are seventeen events in each solo. Each is a kind of haiku”. *Etcetera 2* has determinate and indeterminate parts. According to Cage, these parts are the characteristic of his work since 1952. In *Etcetera 2* the chance operations was used. Cage asked his questions to the I Ching and got the answers. But he did not benefit

from the texts (wisdom) of the I Ching, instead, he used only the numbers (Kostelanetz, 1993, p. 98).

4.2 Typical Features of the Works Based on the I Ching and Chance Operations

John Cage used the I Ching, chance operations in his works such as literary, graphic, and musical. Compositional decisions were made by throwing coins, tossing yarrow stalks, and later by the computer program called IC. By obtaining the I Ching oracles, Cage left many performance decisions to the performer. In all the works produced by consulting the I Ching, Cage considered only the hexagram numbers, and he preferred to take no notice of the meaning of the hexagrams and the interpretations. In other words, he utilized the system merely as the deterministic dominance over his works, without their philosophical wisdom. Shortly, he did not use the text of the Book of Changes for his art works.

He established sounds or group of sounds instead of the hexagram numbers. Lewallen, in the book called *Writing through John Cage's Music, Poetry and Art*, summarized that Cage was “less interested in the I Ching as a book of wisdom than as a mechanism of chance operations that produces random numbers from 1 to 64” (Bernstein and Hatch, 2000, p. 235). “The point of relying so heavily on the oracle was not to receive arcane solutions or esoteric knowledge, but the compose intricate scores based on numerical values, and to reconfigure subjective intention by limiting choice” (Jaeger, 2013, p. 4).

Cage utilized the I Ching to eliminate his own likes and dislikes from the composing process. He trusted the use of this system and was in agreement with his Zen teacher Daisetz Teitaro Suzuki, concerning that “what Zen wants is that mind not cut itself off from Mind but let Mind flow through it” (Kostelanetz, 1993, p. 108). Cage thought that with his use of chance operations, he balanced himself. He says, “Because if I make a wrong move with my knight, I lose. Games are very serious success-and-failure situations, whereas the use of chance operations is very free of concern. It’s like being enlightened” (Kostelanetz, 2003, p. 32). Jones (1993) summarized that “in his continuing reliance on the I Ching and other chance operations, Cage engaged in a dialectic with outside world that encouraged new developments. The ego of choice was married to the selflessness of chance” (p. 665).

In this way, he did not only want to remove his own ego from his art, but he also tried to give the performer the possibility, even the right to co-determinate the details as a co-composer. This means that the performer has the freedom to act according to the own taste and pleasure. Because Cage does not see the music as something that produced by a musician, but something that is perceived by a listener. For him, any sounds can be a music, in the shape which they are heard (Sadie, 2004).

Jaeger (2013), described that for Cage, discovery of chance operations was very important for minimizing personal intention. Moreover, in an interview with Cole Gagne and Tracy Carras, Cage mentioned that, the first time he met Zen, he wanted to create music about Buddhist ideas, but then, he decided, “instead of talking about it, to do it; instead of discussing it, to act it out. And that would be done by making the music non-intentional” (Gagne, 1982, p. 70-86).

Cage employed the I Ching to decide on compositional elements like the number and duration of sounds in his musical compositions. For every work, he created charts to communicate with the hexagram numbers. Tempi, durations, amplitudes, layers and sounds are chosen as a result of the correspondences between the hexagram numbers of the I Ching and the appropriate charts. All of these charts contain each a total of 64 cells in relation to the 64 hexagrams of the I Ching. Cage before composing his works, created charts which divided into group or groups. For instance, First chart = 1-9, Second chart = 10-18, Third chart = 19-27, Fourth chart = 28-37, Fifth chart = 38-46, Sixth chart = 47-55, Seven chart = 56-64 etc. Thus, the chance operations provided Cage to be able to set a process that was not relevant to any work which he had experienced before.

The tempi, which were chance-determined, were speeding up or slowing down, or remaining constant, and how much these were varied was determined by chance operations. In these works, the tempi are not meant in a compulsory manner. Cage wrote that he “did not write in tempo, but in time” (Kostelanetz, 2003, p. 68). The even-numbered and odd-numbered cells cause different implications, such as sound or silence, mobile or immobile.

By using the I Ching, Cage had an opportunity to continue working and he created a work not belong to a person but to something. His compositional tool was not himself, but something else. Some musicians thought that because Cage used chance

operations, his music was not written by him, but by God. Actually Cage used chance operations to make something fixed. He used the I Ching to enforce the performer to create some particular actions. He never meant to compose a music, which tell the performer what to do. He always have tried to create a world in which no one tells the other what to do. The use of chance operations for him was in order to leave the centers free, to not impose his feelings on other people. In his works, his aim was to discipline himself, not to discipline the work. Even if some people thought that Cage was enslaved by the I Ching, he thought quite the contrary; he was liberated by the I Ching.

4.2.1 Works with common features composed by the I Ching and chance operations

Cage's I Ching-based works may be divided into six groups such as, pieces for piano or piano solo and orchestra, pieces for radio, pieces for tape, pieces composed with star maps, pieces for voice, and pieces for any solo. In all Cage's works based on chance operations, there are some resemblances between each other. Cage stated that some of them may be performed simultaneously. These works are identified in below.

4.2.1.1 Pieces for piano or piano solo and orchestra

In some of his piano pieces, Cage sometimes used the same compositional techniques, and sometimes used similar materials. For instance, he involved the same compositional technique in his *Two Pastorales* (1951) and *Music of Changes*(1951). In both of these works, there are the same charts for tempi, durations, sounds dynamics, and layers. Moreover, in his *Seven Haiku* (1951-52) he benefited again from the chart technique of the *Music of Changes*. Cage has two other works which he used the same composition method, *Music for Piano 1-84* (1952-56) and *Winter Music* (1957). In his *Music for Piano* series Cage used the paper imperfections and the I Ching. However, in 1957, he composed his *Winter Music* with the same procedure, adding the indeterminacy. Another piece which was written with the indeterminacy is *Cheap Imitation* (1969). This solo piano work is based on the I Ching. Cage composed this music by using Erik Satie's work *Socrate's* rhythmic structure and changing the melody through chance operations.

4.2.1.2 Pieces for Radio and tape

Imaginary Landscape no.4 (1951) is a work written for twelve radios. Even if it is not a work for the piano, Cage used basically the same compositional technique which he used in his *Music of Changes*. He employed the I Ching to build the charts for tempi, durations, sounds, dynamics and superimpositions. The year after in 1952, Cage composed *Imaginary Landscape no.5*. It is an American piece for tape which was composed for the dancer Jean Erdmann. The composition process was based on chance operations, and the I Ching was used for creating the chart system. Cage's work *William's Mix* (1951-53) is an octophonic (eight channels surrounded) tape piece. I Ching was used to decide where the jumps should be from one sound to another. Cage, when composed his *Imaginary Landscape no.5*, using the jazz recordings for the forty-two phonograph, in his *HPSCHD* (1969) used short radio recordings from L. v. Beethoven's *Appassionata*, F. F. Chopin's *Prelude* and R. Schumann's *Carnaval*.

4.2.1.3 Pieces composed with the star maps

Cage's adventure with the star maps begun in 1961, with his work *Atlas Eclipticalis*. He used the Czechoslovakian astronomical atlas which is mapped in 1958, by Antonín Bečvář. Using the atlas map, Cage transformed the stars into the notes. The I Ching was used to decide some questions such as, which staves and which clefs should be used. In this work, Cage gave the performer the option of playing the *Atlas Eclipticalis* at the same time with his *Winter Music*. The score of the *Atlas Eclipticalis* is a graphic score like *William's Mix* (1951-53) and *Fontana Mix* (1958).

Cage's *Etudes Australes* was written between 1974 and 1975. There are thirty-two etudes which are divided into four books, as in the *Music of Changes*. The same Czechoslovakian astronomer Antonín Bečvář acquired a sky atlas in Prague, in 1964. Cage used this atlas for his etudes. He divided sixty-four hexagrams into six colors, and thus he created color charts. He asked to the I Ching which stars should be traced and how many of them should be used.

Between 1977 and 1990, Cage worked on his *Freeman Etudes*. The etudes contain a set of four books, as in the *Etudes Australes*. He created the star charts to determine for the rhythm and pitch. Moreover, he used the I Ching for dynamics and durations,

and asked to the I Ching about the possibilities of his color charts he was dealing with.

Etudes Boreales for Cello Solo and for Piano Solo I-IV is a work of Cage which was written in 1978. He composed this work with the same method which he employed in his other star chart works, *Freeman Etudes* and *Etudes Australes*. As a common idea with his prepared piano works such as *Bacchanale* or *Sonatas and Interludes*, he used the piano as a percussive instrument, and wanted the performer use the piano as a percussionist.

4.1.2.4 Pieces for voice

Cage's *Solo for Voice 1* (1958) is a work which the time-length is free, and the performer choose the amount of material. The composing means are the chance operations as in the *Concerto for Piano and Orchestra*. This work may be performed alone or may be combined with *Solo for Voice 1*, *Solo for Voice 2*, *Fontana Mix*, *Aria* and *Song Books*. Cage's *Sixty-two Mesostics Re Merce Cunningham* (1971) is another work which is for solo amplified voice. In this work, the I Ching was used to create Cage's mesostics, and to choose from among different typefaces and sizes. The work *Appartment House 1776* is for four voices (may be on tape) and any number of instruments. Cage, as a source material, benefited from the eighteenth-century composer's hymns and the deductions came from the time of the American Revolution. The I Ching was used to make the alterations form these original works into the *Appartment House 1776*. This work may be performed with *Renga* (1975-76).

4.1.2.5 Pieces for any solo

4'33" (1952) is Cage's most famous musical composition. It is comprised of three movements of a silence for four minutes and thirty-three seconds. The work was composed for any instrument or any combination of instruments. Cage's other work which was written for any solo is *Concert for Piano and Orchestra* (1957-58). The concerto may be combined with piano, flute, clarinet, bassoon, trumpet, trombone, tuba, three violins, two violas, cello, double bass, and a conductor. Nevertheless, Cage gave the performer(s) not only the flexibility of performing the piece with the ensembles as solo, duo, and trio etc, but also the freedom for choosing to play the

materials (whole or part), notations, and elements. *Renga* (1975-76) is a work for any solo instrument or voices as well. In this work, the I Ching was used to define the colors which suggested to change the instruments and voices from one to another.

4.2.3 Common or uncommon features of the notations

In an interview, John Cage declared his approach to notation as follows:

I use notation in a variety of ways, all the way from the explicitness of the *Freeman Etudes* to the indeterminacy of *Variations*. I'm not concerned with one particular kind of notation, but with many. I've done also a number of things in which there isn't any notation except verbal directions. Those things have been done by other people, but I continue to work in all those ways rather than in one of them exclusively (Duckworth, 1995, p. 17).

This diversity of notations can also be found in his musical works based on the I Ching and chance operations.

The compositions such as *Concerto for Prepared Piano and Chamber Orchestra*, *Music of Changes*, *Two Pastorales*, *Seven Haiku*, *Winter Music*, *Solo for Voice 1*, *Cheap Imitation* (the versions for solo piano and for orchestra), *HPSCHD* (the solo parts for harpsichords), *Apartment House 1776*, *Freeman Etudes*, *Etudes Boreales I-IV* (both for solo cello and solo piano), *Etudes Australes I, II and VIII*, and *Etcetera 2* are conventionally notated works. Some of these notations are proportional; one inch is equal to a quarter note in *Music of Changes* and *Two Pastorales*, and 1/2 inch is equal to a quarter note in *Seven Haiku*. In the score of *Etcetera 2*, there are indications for playing slightly before or after the beat as well as for microtonal glissandi. *Winter Music* consists of single chords with various numbers of notes. All the interpretative elements are left to the performer, except that the chords should be played without breaking. The score of *Solo for Voice* is also written in conventional notation; however, the different sizes of the notes are related with differences of volume or length. The semi-circles show the notes that have to be determined by the singer respecting the vocal phrases. Microtonal alterations as well as noises are involved (Kostelanetz, 1993). In *HPSCHD*, the solo parts for harpsichords are written in conventional notation. For producing these solo parts, extracts “from piano works by Mozart, Beethoven, Chopin, Schumann, Gottschalk, Busoni, Schoenberg, Cage, and Hiller” (Manning, 2013, p. 202) are used. *Freeman Etudes* are notated in a very detailed manner, almost everything about sound and sound-creation is specified

for each note. Also in *Etudes Boreales*, Cage wrote particular indications concerning timbre, length, articulation, color, and dynamics for each sound. However, in *Etudes Australes*, he preferred to provide no indication for the interpretation at all.

The works *Imaginary Landscape No.5*, *Music for Carillon No.1*, *Williams Mix*, *Concert for Piano and Chamber Orchestra*, *Atlas Eclipticalis*, *Renga* and *Ryoanji* are written in graphic notation. The score of *Imaginary Landscape No.5* is “written on graph paper and simply uses graphic blocks to indicate where sound (from gramophone records) is present”. Moreover, clock time takes the place of tempo and durations (Stones, 2013, p. 123). The score of *Music for Carillon No.1* is also written on graph paper. The original graphic score is formed by points within rectangles. These points describe the timbres and attack times, without determining durations of the single notes. All the notes should last their completely natural duration (Pritchett, 1996). This is also the first work, where Cage used the “imperfections of the paper” method, as he called it. “Using a transparency over a more or less marked or scratched paper, he enlarged some spots before putting a graph or a staff over them” (Heintze, 1999, p. 92). The score of *Williams Mix* contains same-sized images of the tape on paper (Fetterman, 1996). Cage describes that this score “is intended as a pattern for the cutting and splicing of tape-recorded sounds” (Kostelanetz, 1970, p. 109). *Concert for Piano and Chamber Orchestra* has no score in traditional sense. In fact, the score blends various elements such as staves with conventional written notes, graphics, points and calligraphies. The solo piano part shows one of the most elaborate examples of Cage concerning the graphic notation, and he made use of the imperfections on the paper. The instrumental parts are written in a traditional way with staff and pitches. The part for conductor “consists of a table of durations in three columns, where the conductor has to move his or her arm in imitating a clock with varying and unpredictable speeds to the performers” (Heintze, 1999, p. 82). The score for each part in *Atlas Eclipticalis* has four pages, which consist of groups of notes that – as specified by Cage’s instructions – are to be performed in or out of order. The pitches are clearly notated in various sizes for determining the amplitude, but they do not have rhythmic values. In the score of *Renga* exist both the drawings of Thoreau and a durational structure; the latter derives from the poetic scheme of *renga*, a Japanese poetic structure (Nicholls, 2002). *Ryoanji* is possibly the most obvious example of how Cage’s late visual art influenced his music. He translated

the creative process from the visual (his drawing series *Where R=Ryoanji*) to the musical. “Instead of drawing completely around the stones, as he did in the visual works, he drew partial tracings that are to be read as sliding pitch shapes” (Stones, 2013, p. 132). Only the percussion part and orchestra parts are written in conventional notation.

Cage used different systems in the scores of his radio pieces based on the I Ching. The score of *Imaginary Landscape No.4* gives information about tuning, volume and tone color. The durations are written in conventional manner, on a 5-line stave. The proportional notation is used as well; 1/2 inch is equal to a quarter note. The score of *Radio Music*, on the other hand, shows 56 different frequencies between 55 and 156 kHz and notated with numbers, but not on conventional staff.

The poster-sized and hieroglyphic score of *Water Music* comprises directions for pouring water from one box into another, for working with radio, for blowing a duck whistle inside a box with water parts of the piano, and for handling with cards on piano strings (Silverman, 2012) with exact timings. Similar to his works such as *Music of Changes* or *Two Pastorales*, the notation equalizes space to time.

In the series of *Music for Piano* Cage utilized again the imperfections on the paper. The score of *Music for Piano 1* consists only of pitches in whole notes; the durations are left to the performer. In *Music for Piano 2*, “a rhythmic structure was used to control the density of notes”. Beginning with *Music for Piano 3*, all the pieces have a score of one page each. In the scores of *Music for Piano 4-19* and *20*, tempo and dynamics are again left to the performer. The following series of series *Music for Piano* diverge from the previous series in that they contain noises created inside and outside the piano (Pritchett, 1996, p. 94).

Numerous notations of 4'33" exist. As David Tudor mentioned in an interview, the first unpublished score was written in conventional manner, i.e. with staves and measures as in *Music of Changes*, only without notes or rests. The current existence of this score is not known (Fetterman, 1996). The second score was a birthday gift of

Cage for Irwin Kremen⁶⁹, and written in space-time notation, where an eighth of an inch is equal to one second of silence (Revill, 2014). The so-called *First Tacet Edition* is a typewritten score, where the roman numerals show that it is a work with three movements. All movements are marked *TACET*, and the footnote in this score, written by Cage, describes, that it “may be performed by any instrumentalist or combination of instrumentalists and last any length of time” (Nyman, 1999, p.3). The last score, so-called *Second Tacet Edition*, is a calligraphic rework of the previous edition, created by Cage in the mid-1980s (Fetterman, 1996).

The work *Sixty-two Mesostics Re Merce Cunningham* has no musical notation. The various sizes of the letters in the written text could be used as a base for a vocal improvisation with changes of intensity, constitution or expression (Kostelanetz, 1993, p. 97).

4.2.4 The general questions asked to the I Ching

Cage consulted the I Ching for different questions, for each piece, according to contents of them. He used the I Ching “in a way involving a multiplicity of questions” (Kostelanetz, 2003, p. 55). In his *Tokyo Lecture and Three Mesostics*, Cage says, “the way the *I Ching* works as a computer musically is to tell me for instance how many sound events take place in what length of time, at what points in time, on which instruments, having what loudness etc.” (Cage, 1988, p. 7). The examples which are given below are the general questions asked by Cage to benefit from the I Ching before starting the compositional process:

- How many instruments should play?
 - How many notes should be played?
 - Which notes of the phrase will the selected instruments play?
 - In what way?
 - How loud, short, medium or long the sounds should be played?
 - Should they hold each note until the next, shorten it, or give its own length?
- (Cage and Charles, 1981, p. 144).

⁶⁹“Irwin Kremen (1925 –) widely exhibited painter and professor of psychology” (Dickinson, 2006, p. 87).

- *For the works in which the star maps are used:* Which stars should I trace?
- How many stars should I trace?
- *For the color charts:* “Am I to trace the position of those that are blue or green, red or orange, violet or yellow, blue or green and red or orange, blue or green and violet or yellow, red or orange and violet or yellow, or all of them?” (Kostelanetz, 1993, p. 108).
- Which of the modes can be used?
- Which of the twelve possible chromatic transpositions should I use?
- What am I next to do?
- *For the works for string instruments:* Would this note be détaché or legato?
- For how long does that last?
- Which tones for the voices should be active?
- “Which of those ten sounds go in the first section? Which go in the second section and which go in the third?” (Kostelanetz, 2003, p. 239).

4.3 The Applied Analyses for detecting these features

Especially after the 1920s, the sound is observed and analyzed with an entirely different approach. Sound had no more the function as a subordinate element of melody, harmony, rhythm, and form; it obtained the preeminent role (Stein, 1979). Beginning with the first steps of electronic music, noise became a significant factor in music. One of the major thrusts of the Futurism⁷⁰ was to put a high value on noise. Sounds, which had not been regarded as musical in the past, were now important in artistic and expressive sense. Luigi Russolo⁷¹, for example, built instruments between around 1910 and 1930 for creating noise, and called them *intonarumori*. These instruments, which he used in public concerts in Italy, France and England, “consisted in buzzers, bursters, a thunderer, whistlers, rustlers, gurglers, a shatterer, a shriller, and a snorter” (Chanan, 1994, p. 243).

⁷⁰ Futurism: “Italian avant-garde movement, launched in 1909, that exalted the dynamism of the modern world; it was literary in origin, but most of its major exponents were painters, and it also embraced sculpture, architecture, music, the cinema, and photography” (Chilvers, 2004, p. 271).

⁷¹ Luigi Russolo (1885-1947) “Italian composer. In 1909, he joined the Futurist movement of Marinetti and formulated a music based on noise, about which he published *L’arte dei rumori* 1916” (Jones, 1999, p. 563-564).

John Cage, a composer who was particularly interested in noise, recognized the sounds devoid of a conventional hierarchy. He refused to take classical harmony seriously and thought that one can discover the harmony even within one single note. Paul Griffiths (1981) states that even Cage's earliest experiments with tonal composition were based on manipulations of structure, not on melody or harmony. Instead of harmony in traditional sense, it can be debated on a harmony or relation within his usage of the timbres as well as the chords according to the sense of aesthetics in the twentieth century. In his book *Silence*, he noticed that the harmonic structure is traditionally an unknown notion in the Orient, also unknown in the West until the Renaissance culture. Furthermore, he declared that the harmonic structure "is a recent Occidental phenomenon, for the past century in a process of disintegration", and continued as follows:

Atonality is simply the maintenance of an ambiguous tonal state of affairs. It is the denial of harmony as a structural means. The problem of a composer in a musical world in this state is to supply another structural means, just as in a bombed-out city the opportunity to build again exists. This way one finds courage and a sense of necessity (Cage, 1961, p. 63-64).

The musical works of John Cage, which are examined in this thesis, are not tonal; thus, it is not possible to analyze them with methods such as classical form analysis or Schenkerian analysis. They obviously are also not post-tonal works, because they are not based on twelve-tone technique. Indeed, Cage aimed to unchain the parameters of sound from the ultimate control of serialism by utilizing chance operations and indeterminate procedures. Against the pitch of serialism, he placed the time as the center for sound and music (Woods, 1999). Instead of tonal or post-tonal structure, he created the "micro-macrocosmic" rhythmic structure, in which "the proportions of larger sections mirror those of their component parts" (Saffle, 2000, p. 230). As it is seen that the music of John Cage is formed of various constituent parts, it is out of question to utilize any known method to analyze these works as a whole. However, the structures of rhythm, motives and dynamic patterns in Cage's works are examined, and the logical connections between the elements he used as well as their relation to the conception of the works are presented in this thesis.

4.4 Music of Changes

In 1951, John Cage produced the *Music of Changes*, a four-volume work for solo piano, in which every sound was chosen by chance operations. The result "non-

intentional music” which was called by Cage, means that the music was produced by chance (Burnard, 2012, p.152). *Music of Changes*, “highly regarded by the European avant-garde, at least by reputation, it was seen as a part of the compositional ideology they had been in the process of the rebuilding after the war” (Nicholls, 2002, p. 35). Paul Griffiths refers to Cage’s *Music of Changes* as “the *Art of Fugue* of chance operation” (Griffiths, 1981, p. 68).

Music of Changes is in fact, “Cage’s first musical work entirely written with an aleatoric method” (Bock, 2008, p.193). “Aleatoric music is literally music in which chance operations are used in determining what is to be notated or performed”. *Music of Changes*, using the I Ching, “exemplifies a literal aleatoric approach” (Landy, 1994, p.82). “*Music of Changes* is a piece that we could already refer to as an aleatory composition. But, although the composition was determined to an important degree by chance, the performer is still expected in the traditional manner to follow the completely written score” (De Mul, 1999, p.218). John Cage composed the *Music of Changes* “for the contemporary music specialist David Tudor” (Ford, 2011, p. 126). He “completed *Music of Changes* in December 1951, less than a month before Tudor gave its first performance at New York’s Cherry Lane Theater” (Johnson, 2011, p.23). David Tudor made the first performance of the work, in January 1952.

The title of *Music of Changes* came from the Book of Changes, I Ching. In *Music of Changes*, Cage “set up multiple charts for sounds, durations and dynamics. Each chart displays sixty-four cells in eight-by-eight ranks. Each cell is numbered to correspond to one of the I Ching’s sixty-four hexagrams”. “Odd-numbered cells” constitute piano sounds. “Even-numbered cells” constitute silences (Larson, 2012, p. 203-204). “To select an element from one of the charts, Cage tossed coins, located the number of its hexagon in the *I Ching*”. In *Music of Changes*, “every sonic event combined one element from each of their main charts: a chance-selected sound, time length, and loudness” (Silverman, 2012, p. 103).

Cage, in one of his letters to Boulez writes about the structure of the *Music of Changes* as follows:

Charts were... used for the *Music of Changes*, but in contrast to the method which involved chance operations, these charts were subjected to a rational control: of the sixty-four elements in a square chart eight times eight (made in this way in order to interpret as sounds the coin oracle of the Chinese

Book of Changes) thirty-two were sounds, thirty-two were silences. The thirty-two sounds were arranged in two squares one above the other, each four by four. Whether the charts were mobile or immobile, *all twelve-tones were present* in any four elements of a given chart, whether a line of the chart was read horizontally or vertically. Once this dodecaphonic requirement was satisfied, noises and repetitions of tones were used with freedom. One may conclude from this that in *Music of Changes* the effect of the chance operations of the structure (making very apparent its anachronistic character) was balanced by a *control* of the materials. (Nattiez, 1995, p.11)

4.4.1 The Analysis of Music of Changes

Determining the division of the I Ching, allowed Cage to use the I Ching to select easily from any number of 64 possibilities. In *Music of Changes*, using the I Ching, Cage limited his selection to even divisions of 64, like the 8 superimposed parts. He also created probabilities for each event type. The division method insured that the mix of events would be dynamic over the process of the piece (Pritchett, 1988). Consulting the I Ching was the procedure to govern all sound, duration and dynamic charts in the *Music of Changes*. This work “employs the most elaborate system of precompositional charts used thus far: eight charts containing sounds and silences, eight charts with durations, eight charts with amplitudes (dynamics) and single charts for determining tempi and the number of contrapuntal layers” (Nicholls, 2002, 203).

“To select an element from a chart, Cage would simply obtain a hexagram by tossing coins, find its number in the I Ching, and then look up the corresponding in the chart” (Pritchett, 1996, p.78). For this process, “Cage tossed three coins six times producing the six lines of a hexagram. Three heads (HHH) or one head and two tails (HTT) resulted in broken lines and three tails (TTT) or two heads and one tail (HHT) indicated unbroken or straight lines” (Campana, 1985, p.85). Since it is not possible to find Cage’s complete charts of the sound, duration, dynamics, tempo and layer for the *Music of Changes*, I will try to identify the connection between the hexagrams and the charts which I could find in my research.

4.4.2 Sound charts

Cage prepared eight sound charts for *Music of Changes*. These sound charts were similar to the I Ching hexagram chart. Each parameter and each chart was equal to the number of the I Ching chart (see figures 4.18 and 4.19).

Upper trigram >>								
Lower trigram v v	Ch'ien	Chen	K'an	Kên	K'un	Sun	Li	Tui
								
Ch'ien	1	34	5	26	11	9	14	43
								
Chen	25	51	3	27	24	42	21	17
								
K'an	6	40	29	4	7	59	64	47
								
Kên	33	62	39	52	15	53	56	31
								
K'un	12	16	8	23	2	20	35	45
								
Sun	44	32	48	18	46	57	50	28
								
Li	13	55	63	22	36	37	30	49
								
Tui	10	54	60	41	19	61	38	58

Figure 4.18 : I Ching hexagram chart (Berce, 2013).



Figure 4.19 : Music of Changes, sound chart 2 (Pritchett, 1996).

The chart of sound for *Music of Changes* “contain sounds only in the odd- numbered cells, with the even-numbered cells representing silences” (Pritchett, 1996, p.79). According to Lucier (2012), using these odd-numbered and even-numbered cells, the piece ensured that it would breathe and have a spacious quality. Referring to the I Ching, Cage produced a hexagram for each measure. “If the corresponding cell on his chart contained a move, he then chose the sound from the appropriate cell in his

sound chart; if the cell corresponding to the hexagram was empty, he added a silence to the score” (Nicholls, 2002, p. 202). Cage (1961), specified the use of the sound charts as follows:

In the charts for sounds thirty-two of the elements (the even numbers) are silences. The sounds themselves are single, aggregates (cf. the Accord sometimes obtained on a prepared piano when only one key is depressed), or complex situations (constellations) in time (cf. the Chinese characters made with several strokes). Sounds of indefinite pitch (noises) are free to be used without any restriction. Those of definite pitch are taken as being twelve in number. In any chart for sounds (there being thirty-two sounds) two squares (four times four) exist, one above the other. Reading horizontally or vertically, one reads all twelve tones. In the case of the mobility⁷² of sounds (disappearance into history) four in succession also produce the twelve tones, with or without noises and repetitions. In the case of “interference” (the appearance of sound having characteristics in common with the characteristics of the previously sounded situation) the characteristics that produce the interference are omitted from the newly appearing sound or cut short in the situation that has previously sounded. (p. 58)

“The sound chart for the *Music of Changes* consists of single pitches, intervals, aggregates, and constellations (more complex rhythmic combinations). The more traditional ‘pitched’ aggregates and constellations are largely dissonant combinations, which give the work a distinctive chromatic sound” (Nicholls, 2002, p. 204).

“The charts contain a wide variety of innovative piano sounds such as clusters, harmonics, and ‘string-piano’ techniques. “There are also several instances of sounds produced by slamming the keyboard lid and striking the wood under the keyboard” (Bernstein and Hatch, 2000, p.38). “Clusters of piano phrases erupt in small explosions set off from each other by brief haltings, like suspended breaths” (Larson, 2012, p. 204). “All that Cage specifies in absolute terms are the pitches, their associated timbres (open, muted or plucked), and the resonant sound that results from the pedal being depressed throughout” (Johnson, 2011, p. 23). “In some sounds the use of sustaining pedal is indicated as an integral part of the sound” (Pritchett, 1996, p. 79).

⁷² Mobility: According to Cage, “the principle called mobility-immobility is this: everything is changing but while some things are changing others are not. Eventually those that were not changing begin suddenly to change at vice versa ad in finitum” (Cage, 1961, p. 154).

4.4.2.1 The examples of the sound chart cells corresponding to the I Ching hexagram charts

There are eight sound charts that Cage used in the *Music of Changes*. In my research, I could only find excerpts from the first six of them. I benefited from some of the examples of Pritchett's book (1996), to match the I Ching hexagrams with Cage's sound charts No.1, 2, 3, 4, 5, 6. Then, I found the places where Cage used these sound chart examples in the score of the *Music of Changes*. Finally I found the I Ching hexagrams which correspond to Cage's cells of the sound charts. I will demonstrate these fifteen examples with a short analysis to explain Cage's usage of these cells.

4.4.2.1a The example of the sound chart no:1, cell no:1

Cage used this cell in the first measure not exactly as it is written in the sound chart. He exchanged the A in the eighth note chord with A flat, which is written in the sound chart separately as a whole note. He also changed the duration of the long note in the score, dotted double note instead of a whole note.



Figure 4.20 : Sound chart no.1, cell no.1



Figure 4.21 : Example of the Measure 1.

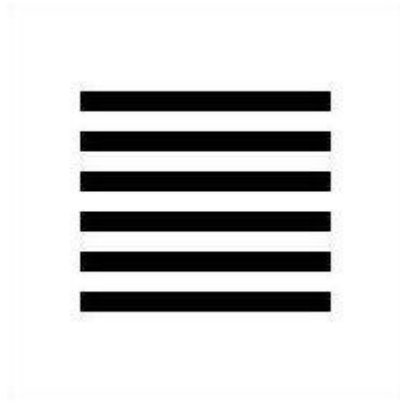


Figure 4.22 : Hexagram no.1, Ch'ien / The Creative.

4.4.2.1b The example of the sound chart no.1, cell no. 43

The values of the first six notes in the sound chart are not precisely defined; they are used in the third measure as eighth triplets. The whole note B in the sound chart is used here in the score as a double note.



Figure 4.23 : Sound chart no.1, cell no.43.

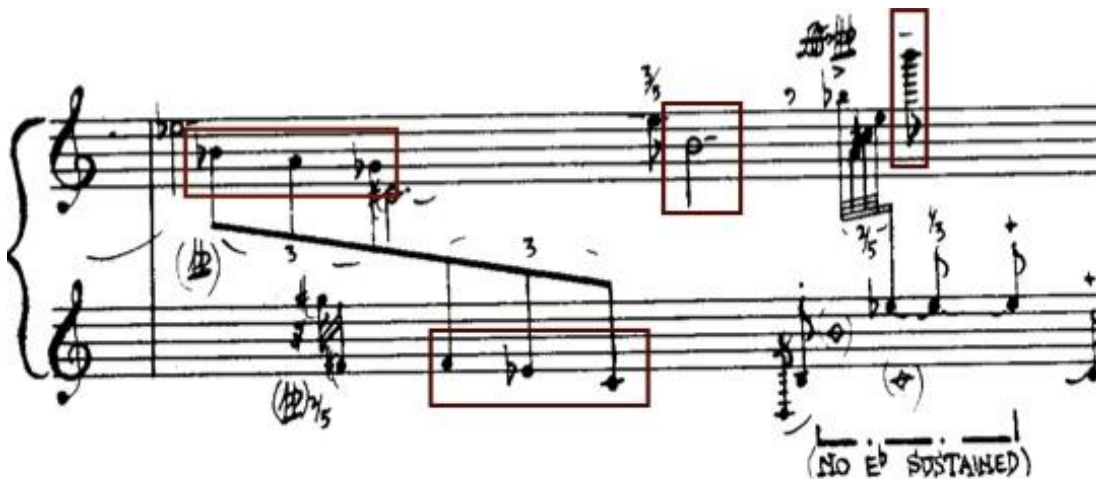


Figure 4.24 : Example of the Measure 3.

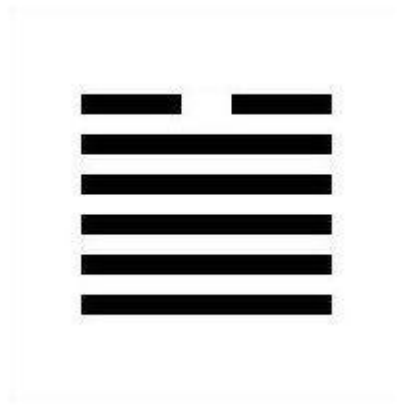


Figure 4.25 : Hexagram no.43, Kuai / Break-through (Resoluteness).

4.4.2.1c The example of the sound chart no.1, cell no.47

This chord is written as whole note in the sound chart, but is used here in the first measure as an eighth note.



Figure 4.26 : Sound chart no.1, cell no.47.



Figure 4.27 : Example of the Measure 1.

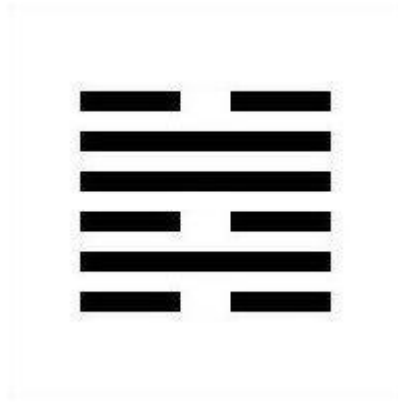


Figure 4.28 : Hexagram no.47,K'un / Oppression (Exhaustion).

4.4.2.2 The examples of the sound chart no.2, cell no.45

The durations of C, the chord B-D flat-E flat, and E are different in the first measure than in the sound chart.

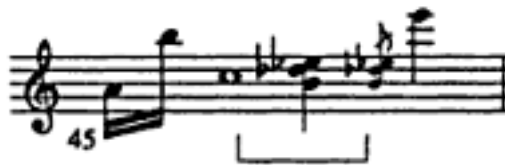


Figure 4.29 : Sound chart no.2, cell no.45.



Figure 4.30 : Example of the Measure 1.



Figure 4.31 : Hexagram no.45, Ts'ui / Gathering together (Massing).

4.4.2.2a The example of the sound chart no.2, cell no.49

The only difference between the sound chart and the first measure concerns G in the lower double note. Whole note in the sound chart, but quarter note in the score.

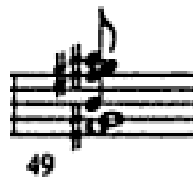


Figure 4.32 : Sound chart no.2, cell no.49.



Figure 4.33 : Example of the Measure 1.

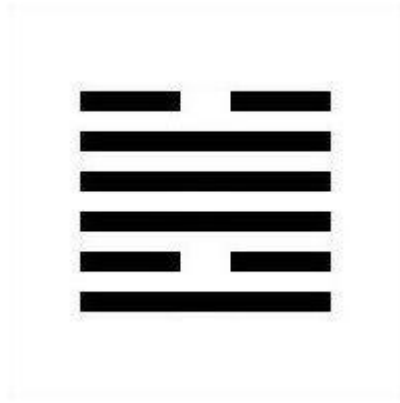


Figure 4.34 : Hexagram no.49, Ko / Revolution (Molting).

4.4.2.3 The example of the sound chart no.3, cell no.3

This chord is written as whole note in the sound chart, but used in the second measure as quarter note.



Figure 4.35 : Sound chart no.3, cell no.3.

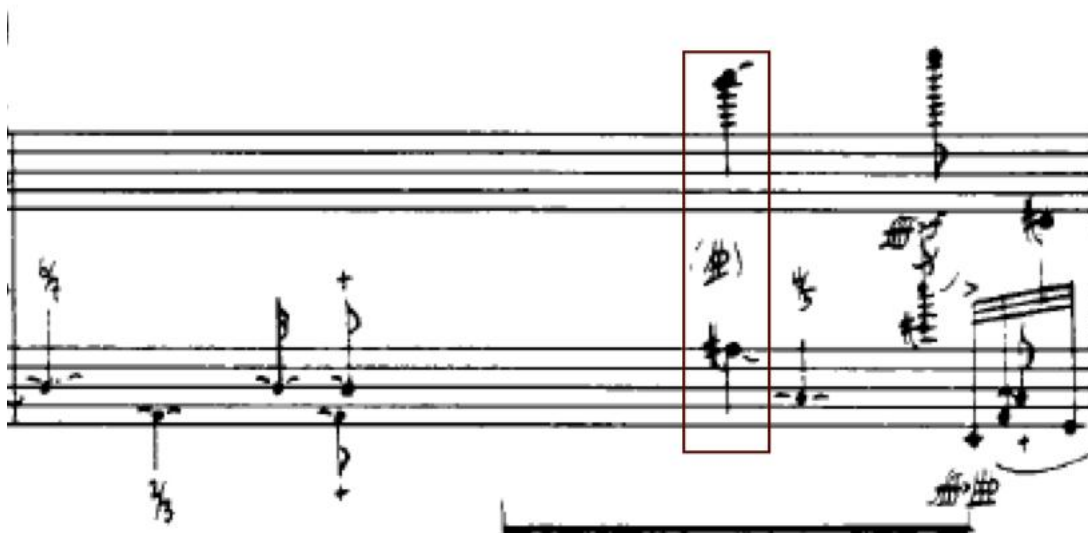


Figure 4.36 : Example of the Measure 2.

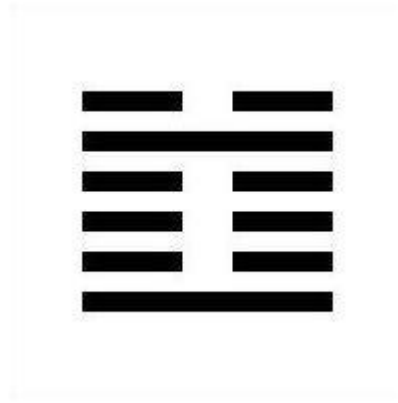


Figure 4.37 : Hexagram no.3, Chun / Difficulty at the Beginning.

4.4.2.4 The example of the sound chart no.4, cell no.11

Cage used the whole note B flat in the sound chart as a half note in the first measure. Between B flat and the chord B-C-G-A, he put a chord from another sound chart.



Figure 4.38 : Sound chart no.4, cell no.11.



Figure 4.39 : Example of the Measure 1.

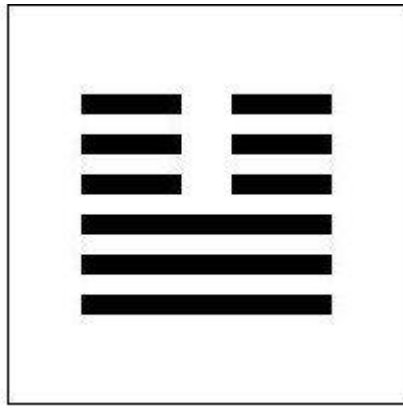


Figure 4.40 : Hexagram no.11, T'ai / Peace.

4.4.2.4a The example of the sound chart no.4, cell no.21

The sixteenth notes in the sound chart are used in the second measure as thirty-second notes.



Figure 4.41 : Sound chart no.4, cell no.21.



Figure 4.42 : Example of the Measure 2-3.

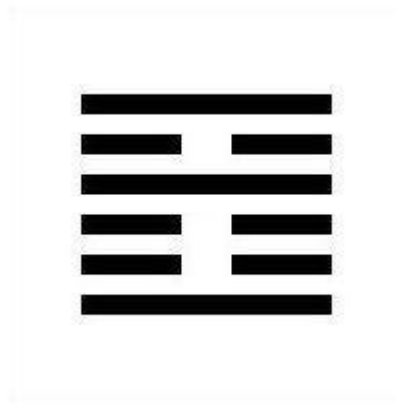


Figure 4.43 : Hexagram no.21, Shih Ho / Biting through.

4.4.2.4b The example of the sound chart no.4, cell no.35

Here are the durations in the score completely different than in the sound chart. The sixteenth notes in the sound chart are used as thirty-second notes, and the double note as a double dotted quarter note in the third measure.



Figure 4.44 : Sound chart no.4, cell no.35.



Figure 4.45 : Example of the Measure 3.

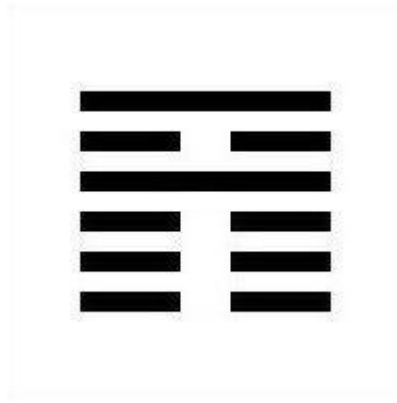


Figure 4.46 : Hexagram no.35, Chin / Progress.

4.4.2.5 The example of the sound chart no.5, cell no.19

The most interesting point in the usage of this cell in the first measure is that Cage preferred to write the lower double note D-F sharp in G-clef with many ledger lines, and it should be played by the right hand. The upper double note D-F is in G-clef as well, but it should be played by the left hand. In the score he used E sharp instead of F, probably because of the usage of F and F sharp at the same time.



Figure 4.47 : Sound chart no.5, cell no.19.



Figure 4.48 : Example of the Measure 1.

4.4.2.5a The example of the sound chart no.5, cell no.33

This cell is used in the first measure exactly like in the sound chart.



Figure 4.49 : Sound chart no.5, cell no.33.



Figure 4.50 : Example of the Measure 1.

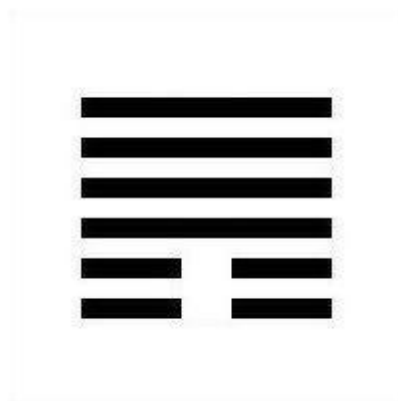


Figure 4.51 : Hexagram no.33, Tun / Retreat.

4.4.2.5b The example of the sound chart no.5, cell no.41

Cage preferred to use the A in the second measure as an eighth note; unlike in the sound chart, where it is written as a whole note.



Figure 4.52 : Sound chart no.5, cell no.41.



Figure 4.53 : Example of the Measure 2.

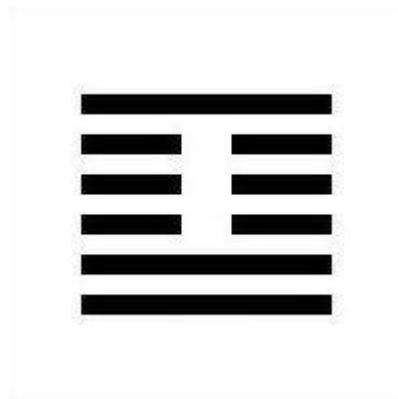


Figure 4.54 : Hexagram no.41, Sun / Decrease.

4.4.2.6 The example of the sound chart no.6, cell no.17

This cell is used in the first measure without any changes.



Figure 4.55 : Sound chart no.6, cell no.17.



Figure 4.56 : Example of the Measure 1.



Figure 4.57 : Hexagram no.17, Sui / Following.

4.4.2.6a The example of the sound chart no.6, cell no.27

Cage used the lower double note F-A in the first measure exactly like in the sound chart. The upper double note is written in eighth notes in the score, but in whole notes in the sound chart.



Figure 4.58 : Sound chart no.6, cell no.27.



Figure 4.59 : Example of the Measure 1.

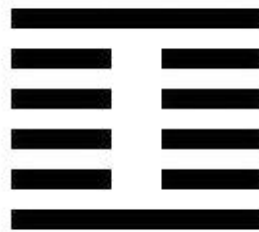


Figure 4.60 : Hexagram no.27, I / Corners of the Mouth (Providing Nourishment).

4.4.2.6b The example of the sound chart no.6, cell no.57

The durations in the sound chart and in the third measure are almost completely different. The eighth notes in the sound chart are used as sixteenth notes in the score, as well as the quarter note as a dotted double note and the whole note as an eighth note. Only the lower B is used in the score exactly like in the sound chart.



Figure 4.61 : Sound chart no.6, cell no.57.

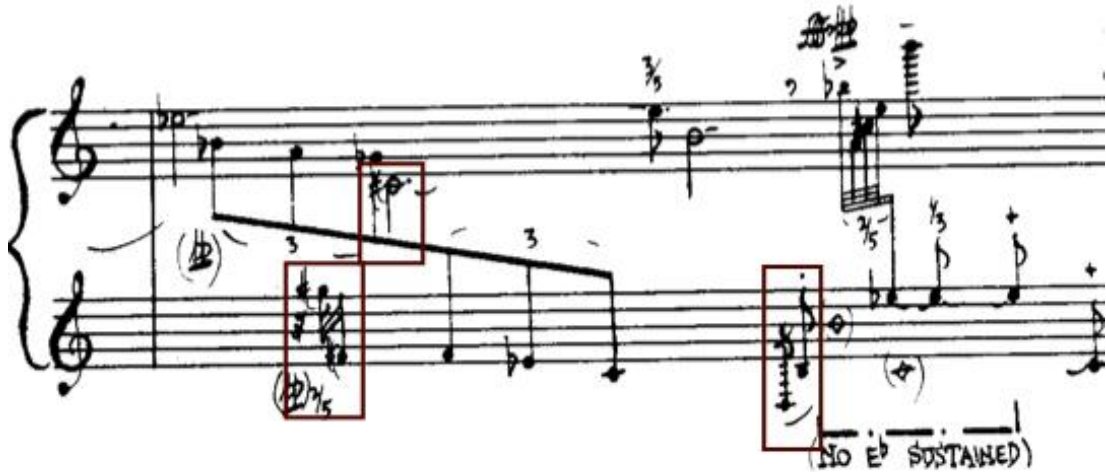


Figure 4.62 : Example of the Measure 3.

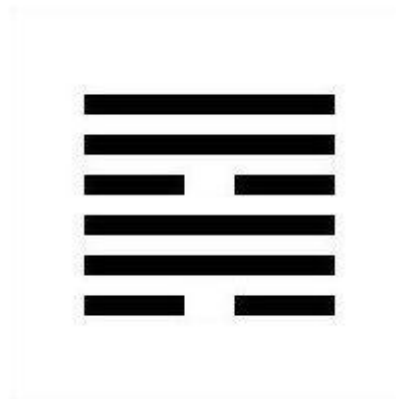


Figure 4.63 : Hexagram no.57, Sun / The Gentle (The Penetrating, Wind).

4.4.3 Mobile and immobile elements

“The changing places of music in the digital era: mobile and immobile sounds. The changes in the diffusion and availability of music have necessarily affected the ways in which we think about (as well as use)” (Blake, 2007, p. 17). Cage’s ideas on mobile and immobile sounds was similarly affected his compositional process of the *Music of Changes*. He “sought a kind of perpetual variation resulting from the continued renewal of his material through what he termed chart mobility” (Nicholls, 2002, p. 207). He wrote that, “Mobile means: if that element is tossed, it acts, but it

disappears” (Cage, 1975, p. 107). Cage designated the half of the sound, duration and dynamic charts (the odd-numbered or even-numbered) as *mobile* or *immobile*. The chart numbers of the mobile and immobile groups are given below (Table 4.3).

Table 4.3 : Chart mobility at the outset of the *Music of Changes* (Au, 2013, p. 57).

	Sound Chart No.	Duration Chart No.	Dynamic Chart No.
Mobile	1, 3, 5, 7	1, 3, 5, 7	2, 4, 6, 8
Immobile	2, 4, 6, 8	2, 4, 6, 8	1, 3, 5, 7

“Cage used eight charts, four were mobile and four immobile (or static) at any given point during the compositional process” (Bernstein and Hatch, 2000, p. 31). In the mobile charts, each element was replaced by another after it had been used (Revill, 2014). “When immobile hexagrams are achieved, the chart remains the same. But when a mobile hexagram is achieved, the cell to which it points is refreshed with new material” (Gentry, 2008, p. 221). In a letter to Boulez of May 22, 1951, while he was working on the *Music of Changes*, Cage wrote as follows:

At this point my primary concern became: how to become mobile in my thought rather than immobile always. And then I saw one day that there was no incompatibility between mobility and immobility and life contains both. This is at the basis of the manner of using the *I Ching* for the obtaining of oracles [hexagrams]. (Nattiez, 1995, p. 94)

Cage’s *mobile thought* related him to the concept of the *changing hexagram* when he began to work on *Music of Changes*. Cage then related his ideas about changing to his chart devise in his work. The chart device of the *Music of Changes* is summarized below (Table 4.4).

Table 4.4 : Parametric chart device of the Music of Changes (Au, 2013, p.49).

Parameters	Number of Charts	Number of Elements in each Chart	Specific Features	Nature of Mobility/ Immobility
Tempo	1	64	32 active, 32 inactive	Immobile
Superposition (Layer)	1	64	1-8 layers	Immobile
Duration	8	64	64 active	4 mobile, 4 immobile
Sound	8	64	32 sounds, 32 silences	4 mobile, 4 immobile
Dynamic	8	64	16 active, 48 inactive	4 mobile, 4 immobile

4.4.4 Dynamic charts (Amplitudes)

Consulting the ancient Chinese oracle I Ching, Cage tossed coins to assign pitch, tempo, duration, silences and dynamics. He also used “tone-clusters, string piano techniques, and noises such as slamming the keyboard lid” (Gagné, 2011, p.54). In the *Music of Changes*, the dynamics range from *pppp* to *ffff*. “In addition to simple (single) dynamics, Cage also used combinations of two, such as *f > pp*, which could be used as accents, crescendos, or diminuendos. The dotted lines beneath some of the dynamics in the charts indicate that the *una corda* pedal was to be used” (Pritchett, 1996, p. 82). Cage extended the concept of change to the construction of mobile and immobile charts for dynamics as well. He summarized his ideas on dynamic chart as follows:

In the charts for dynamics only sixteen numbers produce changes (one, five, nine etc.); the others maintain the previous status. These are either dynamic levels or accents (in the piano piece); levels, diminuendi and crescendi in the radio piece. In the piano piece, combinations of dynamic levels (e.g.

fff > p) indicate accents; in the case of a sound complex in time this may become a diminuendo or (by retrograde interpretation) a crescendo, or derived complex. (Cage, 1961, p.58-59)

Cage “manipulated the dynamics and used pedaling to alter the results of his chance operations in order to yield what he thought were more musical results” (Bernstein and Hatch, 2000, p. 36). The dynamics and articulations vary almost in every note or note group. Cage specifies four pedaling styles, often combining *una corda* and *sostenuto*. He rarely requests plucked strings, finger, dampening, and other actions (Covell, 2006). In the chart for dynamics, only 16 cells out of 64 are used, the remaining 48 were empty. In the process of the composition, if Cage chose one of the 16 completed cell, then this cell would be used. If, one of the empty 48 was chosen, “the previous dynamic indication will be used until another complete cell is chosen” (Paparrigopoulos, 2006). Dynamic chart no.8 is given below (Table 4.5).

Table 4.5 : Dynamic chart no.8 (Pritchett, 1996).

<i>ffff > f</i>	<i>fff > ff</i>
<i>f > pppp</i>	<i>ff</i>
<i>p > ppp</i>	<i>f > ppp</i>
<i>ffff</i>	<i>f > pp</i>
<i>ffff > f</i>	<i>ffff > ff</i>
<i>mf > pp</i>	<i>ffff > mf</i>
<i>p > pppp</i>	<i>p > pp</i>
<i>ffff > ff</i>	<i>mf > mp</i>

4.4.5 Duration charts

“Durations were only the first step in the process - one that was, indeed, wholly mechanical” (Pritchett, 1988, p. 150). In the charts for durations “there are no empty cells, – all 64 cells are complete –, as duration is characteristic of both sound and silence” (Paparrigopoulos, 2006, p. 2). Cage (1961), wrote these explanations about the duration charts:

In the charts for durations there are sixty-four elements (since silence also has length). Through use of fractions (e.g. $1/3$; $1/3 + 3/5 + 1/2$) measured following a standard scale (21/2 cm. equals crotchet), these durations are, for the purposes of musical composition, practically infinite in number. The note stem appears in space at a point corresponding to the appearance of the sound in time, that is if one reads at the tempo, or changing tempo indicated. Given fractions of a quarter, half, dotted half and whole note up to $1/8$, simple addition of fractions is the method employed for the generating of durations. Because addition is the generating means employed the durations may be said to be 'segmented'. These segments may be permuted and/or divided by two or three (simple nodes). A sound may then express the duration by beginning at any one of these several points. (p. 59)

The excerpt from one of the duration charts is given below (see figure 4.64).



Figure 4.64 : Excerpt of the duration chart no.8 (Pritchett, 1996, p. 81).

The durations are described as being *segmented* by Cage. He did not only used the simple metrical values (such as quarter or eighth notes), but also added several different simple durations. The value of these durations range from one thirty-second note to a whole note. They “include sevenths and fifths of beats as well as the common binary and ternary divisions”. Although Cage measured the durations “using traditional rhythmic notations, they are not used within any metrical framework” (Pritchett, 1996, p. 79). In the *Music of Changes*, Cage specifically “referred to the use of fractional durations without the need to complete a bar” (Valkenburg, 2010, p.71).

The first attempt of John Cage at composing with the I Ching, the third movement of Concerto for Prepared Piano, displays a certain monotony concerning the rhythmic durations. In *Music of Changes*, however, he tried to build a richer rhythmic structure, which was the main purpose for creating the eight duration charts, in the same quantity just like the sound charts. Beside the duration charts, there are also other lists of durations, which Cage named “Generation of Durations”. All the durations on

this lists can be divided into two parts, and the second halves of these durations show a rapid alteration. Because of the similarity of the sequences between both halves of durations, it may be presumed that Cage used a system to modificate and amalgamate the first halves of the durations for creating the second halves. The “Generation of Durations” appear to be associated with the chart mobility, as it is possibly utilized as a charging element for the mobile cells of the eight duration charts.

Durations and dynamics of the *Music of Changes* are “similar to the manner in which the integral serialists sought to submit all musical parameters to the *a priori* discipline of a prescriptive method” (Boutwell, 1999, p. 81). In order to facilitate “the odd fractional durations, Cage applied a simple procedure: he standardized the horizontal distance between notes with the same rhythmic value” (Pritchett, 1996, p. 79-80). In this work, since the I Ching produced rhythmic ideas did not demonstrate metric association, “a quarter note’s duration is equivalent to 2.5 centimeters; each measure is 8.5 centimeters in length or 3 and 2/5 quarter notes” (Campana, 1985, p. 88).

Dividing the materials such as sound, dynamics, and durations was a method, which shapes the main approach of John Cage for composing *Music of Changes*. Determining the cells in the charts by tossing coins may be a mechanical process, but the compound management of all these materials displays a top-level of creativity and innovation in the work as well as in the personality of John Cage.

4.4.6 Tempo chart

“The idea of gradual tempo change became equally important in the 1950s”. Cage used the idea of continuously accelerating and decelerating tempos in *Music of Changes* (Nicholls, 1997, p. 187). The tempo changes was determined by “means of a chart and the I Ching” as well (Pritchett, 1996, p. 83). “The tempo has sixty-four cells, but contains tempi in only thirty-two, a blank cell indicates that the tempo remains constant” (Nicholls, 2002, p. 204). Au (2013), illuminated Cage’s tempo chart in the figure below (see figure 4.65).

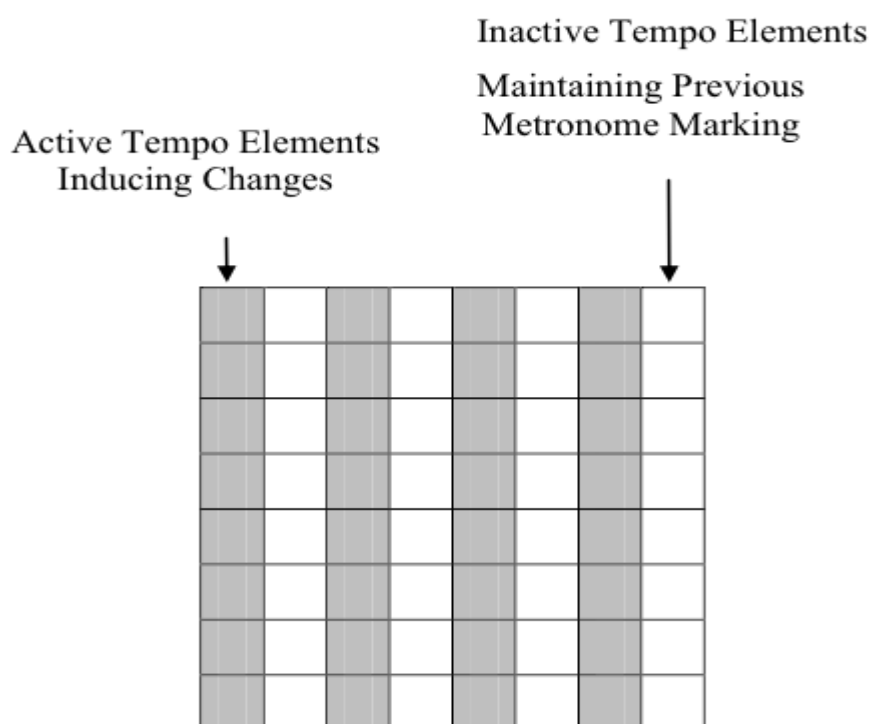


Figure 4.65 : Tempo chart in the *Music of Changes* (p. 51).

The thirty-two of the sixty-four elements in the tempo chart were active and the rest thirty-two were inactive. The changes of the tempo continues through the entire work, in the four books. Generally, the tempo changes are indicated with the markings of *ritardando* or *accelerando*. The tempo changes almost in every seven measures. The example of the changes of tempo in the *Music of Changes*, Book II, are given below (see figure 4.66). The example shows the measures 22-31, where the changes of tempo are remarked with bold numbers.



Figure 4.66 : Music of Changes, Book II. Measures 22-31.

The notation of the *Music of Changes* “is not quite traditional”, but also “not yet time-space notation”. “The conventional barring structure collides with tempo changes determined parametrically” (Iddon, 2013, p. 37). In a conversation with Kostelantetz (2003), Cage mentioned about his use of tempo and said “I didn’t write in tempos but always in time”. He added that, “when a musician writes in measures” and assigns “to the unit of those measures a metronomic figure”, such as largo and

andante, Cage noticed and subjected the tempo. In the *Music of Changes*, we see that every few measures are “speeding up or slowing down or remaining constant. How much these things varied was chance-determined” (p. 68). “Since the shape of the piece is determined by the changing tempo indications the player was first estimate the length of each line or each page in seconds, and then follow the graphic spacing of the score”. For instance two silences which look in the same length are moved with a different tempo, so that “last different lengths of time” (Nyman, 1999, p. 61).

According to John Cage, David Tudor, who gave the first performance of the *Music of Changes*, “learned a form of mathematics which he didn’t know before in order to translate those tempo indications into actual time” (Kostelanetz, 2003, p. 68). The tempo chart of David Tudor Papers is given below (see figure 4.67).

176	58	192	108
88	96	60	132
66	112	104	56
52	92	138	152
63	168	104	48
160	72	100	69
116	126	50	84
80	184	120	76

TEMPO (each small structural division)
 (blanks are according to tempo)
 (determines mobility - usually by four med. structural divisions)

Figure 4.67 : Tempo chart, David Tudor Papers. 1884-1998 (bulk 1940-1996), Getty Research Institute, Research Library, accession no. 980039 (Bernstein and Hatch, 2000, p. 34).

4.4.7 Rhythmic structure of the Music of Changes

In his dissertation *The Development of Chance Techniques in the Music of John Cage, 1950–1956*, James Pritchett described John Cage’s definition of *rhythmic structure*. Cage defines this term as a method of connecting the durations of diverse sections of a work by utilising a particular set of proportions, which are shaping the durations at different structural stages. A series of numbers are identifying the span of phrases in terms of measures. One complete set of the proportions at a small-scale section creates a phrase group, and Cage normally indicates this through a double barline. Even the same proportion numbers show the lengths of large sections in terms of these groups at the big picture. As a result, the proportions of large sections are equal to the proportions of the phrases inside of every single phrase group. With the terms ‘rhythmic structure’, ‘micro-macrocosmic form’ or ‘square-root form’, Cage referred to the uniformity of the subdivision of the whole and the subdivision of its parts” (Valkenburg, 2010, p. 69). In his own words, “the whole has as many parts as each unit has small parts, and these, large and small, are in the same proportion” (Cage and Kostelanetz, 1968, p. 127).

The *First Construction (in Metal)* 1939, is Cage’s first trial with this kind of structure. As seen in figure 5.68, every single phrase group includes sixteen measures, divided into five phrases. The lengths of this measures in the phrases are 4, 3, 2, 3, 4. The complete work is created from sixteen of these groups, similarly divided into five sections, whose lengths in groups are specified by the same number series. Cage himself characterized the structure of this work as being “sixteen times sixteen measures of 4/4” (Kostelanetz, 1993, p. 6).

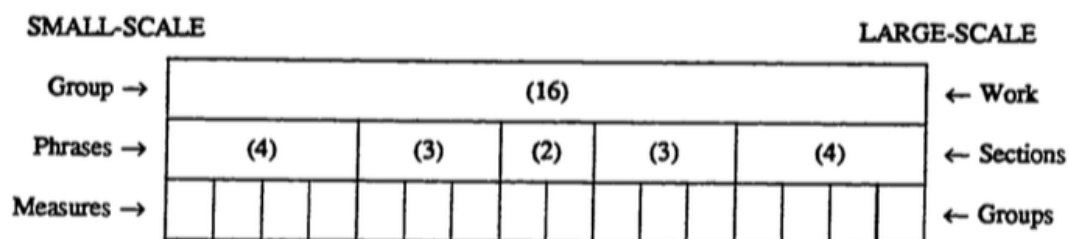


Figure 4.68 : *First Construction (in Metal)*, rhythmic structure (Pritchett, 1988, p. 16).

Until 1956, Cage benefited from this method in practically all of his concert works. He used it “as a starting point for his compositions” (Valkenburg, 2010, p. 69). It would not be wrong to say that the determination of the rhythmic structure was the basic line for his works, especially for his indeterminate works; then it organizes almost all the predetermined elements such as sounds, durations and tempi. For the compositional process of the rhythmic structure, Cage described that “the rhythmic structure is now magnificent because it allows for tempi: accelerandos, ritards, etc.” (Nattiez, 1995, p. 95).

Music of Changes started the musical alliance, which maintains “the fixed-proportion rhythmic structure”. Such notation “often called ‘space-time notation’ was widely adopted during the 1950s, 1960s, and 1970s” (Griffiths, 2010, p. 28). The structure of this work is again a rhythmic one, Cage thought here of micro-macro rhythmic structure. He said, “what I did was to develop rhythmic structure from a fixed tempo to changes of tempo. I had not yet moved to a renunciation of absolutely all structure” (Kostelanetz, 2003, p. 68). Cage’s micro-macrocosmic structure means that we have a “basis structural unit consisting of a small number of phrases”. In the *Music of Changes*, the rhythmic structure is expressed “in $\frac{4}{4}$ bar units”, and “the structural proportions are almost symmetrical: 3; 5, $6\frac{3}{4}$; $6\frac{3}{4}$; 5, $3\frac{1}{8}$ ” (Valkenburg, 2010, p. 71). Although there is a particular symmetry (except the final $\frac{1}{8}$), the numbers themselves do not have a connection to another one in a logical way. Furthermore, the fractions in the structure cause some unusual changing meters. The third and fourth sections with durations of each $6\frac{3}{4}$ demand a phrase group, with a size of three-quarter; and another phrase with a size of one-eighth is involved in the last section, whose duration is $3\frac{1}{8}$.

As shown in figure 4.69, one complete phrase group is formed with $29\frac{5}{8}$ measures, and indicated as 29 measures of $4/4$ meter and one measure of $5/8$.

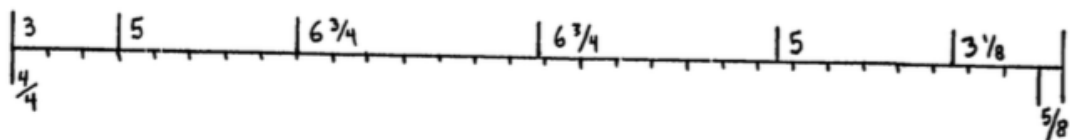


Figure 4.69 : Structure of a complete phrase group (Pritchett, 1988, p. 110).

The groups with a size of three-quarter are diagrammed in figure 4.70. These groups have lengths of $22\frac{7}{32}$ measures of 4/4 in total, and are formed by a mixture of bars in 4/4, 17/16 and 3/32 meters.

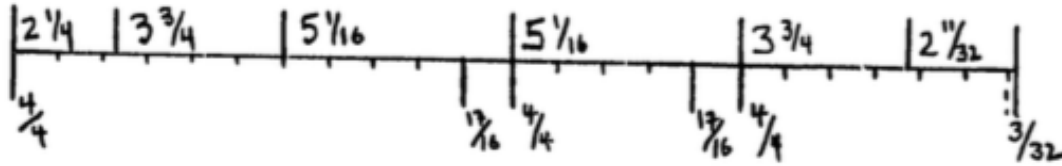


Figure 4.70 : Structure of three-quarter-sized groups (Pritchett, 1988, p. 110).

Finally, figure 4.71 illustrates the group with a size of one-eighth has a length of $25\frac{3}{64}$ measures of 4/4.

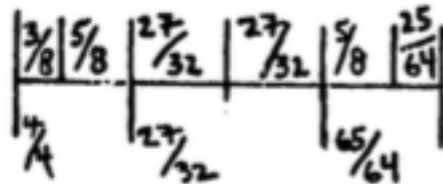


Figure 4.71 : Structure of the one-eighth-sized group (Pritchett, 1988, p. 110).

It could be said that the rhythmic usage in *Music of Changes* is the most remarkable revolution of this work. In previous works, in *Concerto for Prepared Piano* for instance, Cage indeed found and utilized the principle of ‘no-continuity’ regarding to pitch progression. Thus, each sound was equal to every other sound or silence, and the music was such a random chain made by these independent materials, without any pitch relation. On the other hand, all the sounds were forced to be organized by the beat and bar. The duration of an eighth note could not be comprehended as itself, but only as the half of a quarter note. “In *Music of Changes*, this ‘tyranny of the beat’ is overcome by allowing any fraction or multiple of a beat to exist independently” (Pritchett, 1988, p. 154). An eighth note in *Music of Changes* is just an eighth note, and not a half of a quarter note, which requires to be completed. With Cage’s own words, “every note is a half-note but travelling, as it were, at a different speed” (Nattiez, 1995, p. 95).

4.4.8 Superpositions (Layers)

Cage used the term *superposition* instead of *texture* for the number of layers in the *Music of Changes*. In this work, there are layers from one to eight, and all of them are immobile. These layers direct the texture of the music. If the layers are lesser, then there would be a thin texture, likewise, if the layers are more, then there would be a dense texture. The textural changes are derived from this chart (Table 4.6).

Table 4.6 : Superposition chart structure in the Music of Changes (Au, 2013, p.55).

Chart Row	Hexagrams	Layer(s) Active
1st	1-8	1
2nd	9-16	1, 2
3rd	17-24	1, 2, 3
4th	25-32	1, 2, 3, 4
5th	33-40	1, 2, 3, 4, 5
6th	41-48	1, 2, 3, 4, 5, 6
7th	49-56	1, 2, 3, 4, 5, 6, 7
8th	57-64	1, 2, 3, 4, 5, 6, 7, 8

For instance, we could activate two layers, if we had hexagrams 9 to 16. Likewise, we could activate 8 layers, if we had hexagrams 57 to 64. “For each phrase the tempo and the number of layers were determined by a single hexagram” (Pritchett, 1988, p. 130). Cage “selected elements from these charts composing one layer at a time until the phrase was filled” (Bernstein and Hatch, 2000, p. 36). “The number of layers changed with each phrase unit of the rhythmic structure, the precise numbers being determined by the *I Ching* and a density chart”. Each layer has “its own unique set of sound, duration and dynamic charts” (Pritchett, 1996, p. 84).

James Pritchett was (he believed) the first person who methodically and in a detailed form, studied Cage’s manuscripts and working notes in his chance compositions. Pritchett’s approach and his system of analysing to Cage’s music was the closest one which made me solve what happened in the *Music of Changes*. In my research, to analyze, comprehend and digest –at least- the cues of this work, I mostly have read and benefited from his books, the doctorate dissertation and articles. To explain the sounds, dynamics, durations, and layer charts, Pritchett (1996), gave all his examples through the first three measures. The following three examples (see figures 4.72,

4.73 and 4.74) show the six layers of the phrase. In the score, we can see the original measure, and the separated six layers. Through these examples, we can see how the sounds and rhythms were arranged and constituted a thin or a thick texture.

The image displays a musical score and its constituent layers. At the top, the 'Score' is shown on a grand staff (treble and bass clefs). It contains a complex melodic line with various dynamics: *pp* (pianissimo), *ff > pp* (fortissimo to pianissimo), and *pp*. The score includes time signatures of 1/5, 2/5, and 4/5. Below the score are six numbered layers (1 through 6), each on a grand staff. Layer 1 is a single note. Layer 2 is a single note. Layer 3 is a single note. Layer 4 is a single note. Layer 5 is a single note. Layer 6 is a single note. The layers are arranged vertically, showing how the overall texture is built from individual components. The dynamics *pp* and *ff > pp* are also indicated for some layers.

Figure 4.72 : Score and constituent layers no.1 (Pritchett, 1996, p. 85).

The image displays a musical score and its constituent layers for a piece titled 'no.2'. The score is presented in a single system, with the layers numbered 1 through 6 on the left side. The notation includes various musical symbols such as notes, rests, and dynamic markings like 'pp', 'f', and 'ppp'. The score is divided into measures, with some measures containing multiple notes and others being empty. The layers are numbered 1 through 6, with layer 1 being the top layer and layer 6 being the bottom layer. The notation includes various musical symbols such as notes, rests, and dynamic markings like 'pp', 'f', and 'ppp'. The score is divided into measures, with some measures containing multiple notes and others being empty. The layers are numbered 1 through 6, with layer 1 being the top layer and layer 6 being the bottom layer.

Figure 4.73 : Score and constituent layers no.2 (Pritchett, 1996, p. 86).



Figure 4.74 : Score and constituent layers no.2 (Pritchett, 1996, p. 87).

4.5 Diagnosis and Assessment of the Analysis of the Music of Changes

Music of Changes, written in 1951, is a work for solo pianist and consists of four books. The work intensifies on sounds and silences. The silences in Cage's music "were an invitation to be filled with ambient sounds" (Wilkinson, 2008, p. 2). "He used it not simply as a gap in the continuity or a pause to lend emphasis to sounds, but in much the same way the contemporary sculptors were using open space, or 'negative volume' –as an element of composition– it self" (Sim, 2007, p. 113). As Cage said, "there is no such thing as an empty space or an empty time. There is always something to see, something to hear" (Cage, 1961, p. 98). Until to *Music of Changes*, Cage "had based his music on the traditional notation that a composer has to 'say' something. After the chart system, he got his first "indication of the possibility of saying nothing" (Silverman, 2012, p. 103).

Cage did not adopt a western music approach; instead, he used an eastern touch in his music. Nevertheless, he thought that the *Music of Changes* was a characteristic of Western Music. He wrote the following sentences in his book *Silence* (1996):

The *Music of Changes* is an object more inhuman than human, since chance operations brought it into being. The fact that these things that constitute it, though only sounds have come together to control a human being, the performer, gives the work alarming aspect of a Frankenstein monster. This situation is of course characteristic of Western music. (p. 36)

According to Alfred Nieman (1914-1997), the British pianist and composer, the *Music of Changes* is a “large introverted work, in a neo-Expressionistic vein. Clusters, polychords, thick textures contrasted with thin ones. The pedals have a great part on this work, for instance, “one section holding the pedal down for five pages”. “Some serial” and “pointillistic” style are used through the work (Hinson and Roberts, 2014, p. 724).

4.5.1 Rhythm, time and tempo

The *Music of Changes* does not contain standard tempo markings. According to the explanation of Cage, in a lecture (1958), the charts and chance operations determined the stability or change of tempo, at each small structural division, or in the latter measures (Revill, 2014). The work is written in a rhythmic structure, but these structures “that have become so flexible through the admission of accelerandos and ritards that the time is no longer fixed” (Duckworth, 1995, p. 11). The rhythmic structure of the piece was 3; 5, 63/4; 63/4; 5, 31/8. Cage decided to vary the tempi to make it more flexible. In the score of the *Music of Changes* (1961), Cage wrote an information about the rhythmic structure and the changing tempi as follows:

The rhythmic structure, 3; 5, 63/4; 63/4; 5, 31/8, is impressed in changing tempi (indicated by large numbers) (beats per minute). A number repeated at the succeeding structural point indicates a maintained tempo. Accelerandos and ritards are to be associated with the rhythmic structure, rather than with the sounds that happen in it.

The notation of the *Music of Changes* has a system of treble clefs and bass clefs. The coin system decided whether the stave was set in bass or in the treble clef. Nevertheless, duration, tempo, dynamics and pedalling were left free (Revill, 2014). After establishing the clefs, Cage “divided the sixty-four hexagram possibilities into three categories. The “normal (played on the keyboard); muted; and plucked (the two latter played on the strings of the piano)” (Smith, 2012, p. 205). For example, a

number 2 through 6 produces a normal; 7 through 45 a muted; and a 47 through 64 a plucked piano tone. In the *Music of Changes*, “despite using a traditional rhythmic notation, there is no metrical structure given to the durational scheme” (Song, 2008, p. 195). According to Pritchett (1988), Cage developed a standardised notational technique to facilitate the durational situation. Pritchett explains it as follows:

In *Music of Changes* one quarter-note is equal to 2.5 centimeters of length. All other rhythmic values are related to this scale, so that an eighth-note takes up 1.25 centimeters, for example, while a half-note takes up 5 centimeters. Using this system, Cage was able to display easily the ametrical duration within the framework of the metrical rhythmic structure. (p. 122)

This system helped the performer to play every 2 ½ centimeters of space, in a standard unit of time. David Tudor, the first performer of the *Music of Changes* described that, “his experience of performing pulseless works” as “watching time, rather than feeling time” (Maconie, 2005, p.123).

4.5.2 Tone, timbre and effects

In the *Music of Changes*, the score was written according to the results of the I Ching (coin tosses), to organize pitch, amplitude, timbre and duration. The open, muted or plucked timbres which Cage used, provided us to hear quite different sounds than the traditional timbre of the piano. As a musician, Cage had a great interest for percussion instruments and their unusual sounds. Edgard Varèse was Cage’s “spiritual mentor” for his “experimental trail”. He said; “Years ago, after I decided to devote my life to music, I noticed that people distinguished between noises and sounds. I decided to follow Varèse and fight for noises, to be on the side of the underdog” (Wright, 2014, p. 375). In his work, *First Construction (in Metal)* (1939), there are six percussionists who play the piano, ox bells, cowbells, sleigh bells, metal thunder-sheets and water gongs. In the *Music of Changes*, he again used the piano as a percussive instrument. Cage used many different percussive effects. One of them is produced by “slamming the keyboard lid” (see figure 4.75). His *Music of Changes*, book III, “is notated by means of an additional single lined notation system. A normal note head and the direction slam keyboard lid request to close the lid violently” (Dimpker, 2013, p. 187).

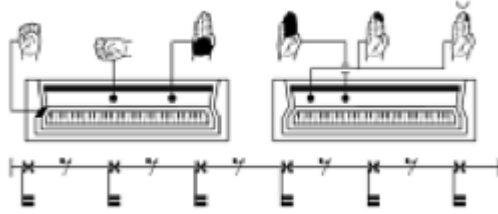


Figure 4.75 : Stroken on the keyboard lid and wooden strip (Dimpker, 2013, p. 187).

Change-ringing is “a ring are tuned in a scale” (Polster, 2002, p. 144). It is an “art and practice of ringing a peal of bells varying and systematic order” (Baker, Slominsky and Kuhn, 1995, p.50). According to Maconie (2010), the composed element of ringing changes “lies in the variation in order of successive rounds, which is composed somewhat like a dance in which each bell steps back and forth through the order in a more or less regular sequence” (p. 342). In addition, he thinks that Cage’s *Music of Changes* “alludes to change-ringing as setting a precedent for a method of composing by number permutation” (Maconie, 2010, p. 342).

Cage discovered that sometimes “a single key when depressed may reveal a multiple sound”, and he adopted “the gamuts of tones, intervals and aggregates” in his music (Nyman, 1999, p. 45). He used the idea that the pianist depress keys at some points, but does not allow to give them a sound. In the following figures 4.76 and 4.77, we can see excerpts from the books II and IV, where the diamond note-heads indicate silently depressed keys.



Figure 4.76 : John Cage, Music of Changes, Book II, fourth page.

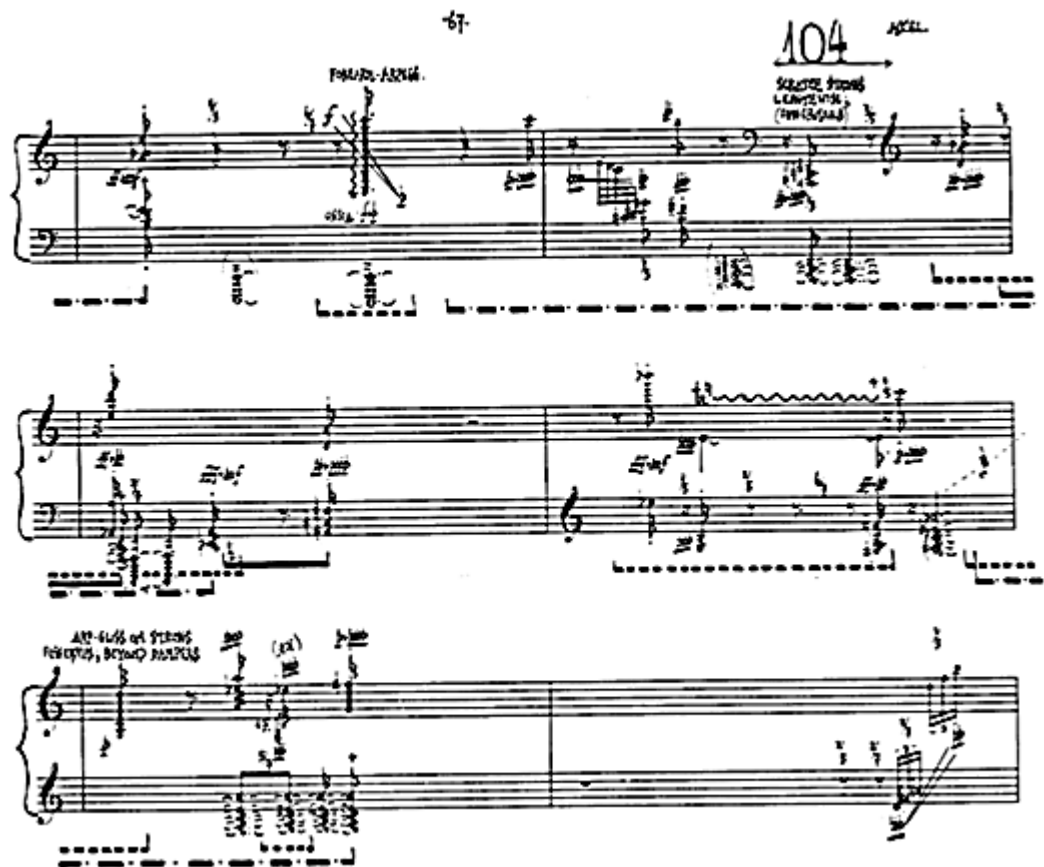


Figure 4.77 : John Cage, *Music of Changes*, Book IV, third page.

4.5.3 Pedals

In works by Cage, “the directions for pedaling are detailed, the results are as important to the sound as are the dynamics and articulation, and a high degree of pedal virtuosity is necessary for a satisfying performance” (Rosenblum, 1993, p. 175). Cage used the pedal as a structural element, not to color or blur passages (Lucier, 2012). In *Music of Changes*, the use of pedal was simply added by Cage according to his own taste. He also used it to fill the “long empty spaces appear between the sounds”, “by holding down the pedal for the duration” (Pritchett, 1996, p. 89). In various cells of sound and dynamic charts, the use of sustain and una corda pedals are signed as integrated element of sounds and dynamics.

Another interesting point about pedaling in *Music of Changes* can be found in a letter of David Tudor to John Cage from late July 1951. In this letter, which is obviously written during the creating phase of *Music of Changes*, Tudor wrote: “I have revised the pedaling considerably, we’ll see how you like it” (Iddon, 2013, p. 18).

The indications in the *Music of Changes*, such as the *damper pedal* “marked with a solid line under the notes” and *una corda* pedal “which shifts the hammers to strike one instead of three strings for each note, marked with a dashed line”. The *plus* above the note (see figure 4.78) releases “a key to stop the note” (Burkholder, Grout, and Palisca, 2010, p. 556).





Figure 4.80 : After the attack, sustaining overtones.

The use of sustain pedal, especially as half pedal, is significant to organize passages with combined dynamics. In such cases, where for example a cluster is to be played in *ff*>*pp*, the use of the half pedal facilitates the catching of the reverberation in *pp* of the original attack in *ff*. This is an important point, because passages with different articulations, durations and dynamics are existing in this piece to a large extent, and the sustain pedal plays an indispensable role by realizing these effects.

4.5.3.2 Una corda pedal (soft pedal)

According to Cage (1961), the una corda pedal (see figure 4.81) brings “alterations of timbre and frequency for many of the prepared keys” (p. 25). The una corda and the damper pedals vary the timbre. “The una corda pedal allows the hammer to strike only one string per key, instead of producing a fuller sound by striking two or three strings per key” (Wilkinson, 2008, p. 5). Cage used the soft pedal to change his modified tones by depressing it while playing (Terry and Bowman, 2001, p. 63). In the works with prepared piano, Cage had the possibility to change the amount and timbre of the prepared note by using the soft pedal. According to Rosenblum (1993), in the modern grand piano, “when the *una corda* is engaged the hammers strike the strings on a less-worn part of the felt. This adds to the change in timbre that also arises from the sympathetic vibrations of the unstruck strings” (p. 163). In the dynamic charts of the *Music of Changes*, there are “the dotted lines beneath some of the dynamics” which “indicate that the *una corda* pedal was to be used” (Pritchett, 1996, p. 82).



Figure 4.81 : Una corda pedal (soft pedal).

4.5.3.3 Sostenuto pedal

Wilkinson (2008), summarized that through the sostenuto pedal (see figure 4.82), the strings of depressed notes are allowed to vibrate freely. The sostenuto and una corda markings enable more effective sounds for an active performance. Cage was a composer who used his own tastes in the compositional process, nevertheless, he never gave up his idea on making music by using the rules of the chance operations. According to Pritchett (1988), in the *Music of Changes*, “every attempt was made, through manipulation of durations as well as the use of the sustaining and sostenuto pedals, to make the sound combination produced via the *I Ching* playable” (p. 151). In my opinion, to obtain a more noisy and stronger effect from the performance, the sostenuto pedal can be used in combination with damper pedal in this way: Using firstly the damper pedal, then the sostenuto pedal without loosing the damper pedal, then lossing the damper pedal without loosing the sostenuto pedal, finally loosing the sostenuto pedal and simultaneously striking and holding the damper pedal. Thus, the performer can obtain the resonance of the whole strings.



Figure 4.82 : Sostenuto pedal.

4.5.4 Sounds and silences

Cage produced a creative work with the *Music of Changes*, by reading the *I Ching* (Book of Changes), tossing the coins, and matching the 64 hexagrams to the musical elements. He generated eight charts for sounds, dynamics, superpositions (layers), durations, and tempi. The half of the voices (32) were constituted of the odd-numbered and the other half (32) constituted of the even-numbered elements. When the odd numbered voices correspond to sounds, the even-numbered voices correspond to silences. All sounds were used in the different forms such as the single pitches, tone clusters, glissandos or chords. The possibilities of the dynamics, rhythm and tempo were chosen from the charts as well. Ford (2011), argued that for Cage “the act of listening was all that was necessary for sound to become music” (p. 199). According to Cage (1961), “it is thus possible to make a musical composition the

continuity of which is free of individual taste and memory (psychology) and also of the literature and ‘traditions’ of the art” (p. 59). For Cage, atonal music still consisted of “notes played by the same traditional instruments”. He wished “to expand the range of acceptable musical material to include not only the twelve tones of the chromatic scale, but any sound made by any means” (Peterson, 1994, p. 82). Cage allowed the sounds “to seek their own meanings”. He believed that “the best situations for people as for sounds were those in which they were free to be themselves” (Sitsky, 2002, p. 97).

4.5.5 Non-western tradition and Eastern philosophy in the Music of Changes

Actually, using the I Ching system, Cage “represents an extraction of a formal system”. He has taken “a formal system out of its original cultural context and appropriated its use” to generate his own “Western-based compositional idioms” (Everett and Lau, 2004, p. 17). Cage had implied himself “to redefining the systems of notation and interpretation that had evolved in conformity with that same Western tradition” (Maconie, 2005, p.140). Nevertheless, according to Eggebrecht (2010), “given the extent of Cage’s involvement in western traditions and contexts, we should not overestimate his affinity with far-eastern thought”. Since Cage has referred to Zen Buddhism in particular, “again and again when putting forward his ideas” (p. 127). Eggebrecht (2010) summarized that “Cage’s radical, anti-traditional position” locates him within the western musical tradition” (p. 127).

Cage’s use of the I Ching represents the effects of the Eastern philosophy. After he had started to interest in the Eastern philosophy, his compositions transformed in terms of the musical style and philosophy. By turning his face to the East, he did not mean to escape from the West, but he meant to attain a new Gothic artform (Patterson, 2002). The Eastern appropriations affected Cage’s approach to music aesthetically. The I Ching was “the primary mechanism” which made Cage generate his compositions after 1951, as in the *Music of Changes* (Nicholls, 2002, p. 51). In the *Music of Changes*, as in the other chance operations based compositions, there is “the lack of conscious control of actions and their superposition” (Clarkson, 2003, p.

118). Earle Brown⁷³ mentioned that Cage was “beginning to consciously deal with the ‘given’ material and, to varying degrees, liberate them from the inherited functional aspects of control” (Hugill, 2012, p. 126). Cage’s lecture (1952), speaks of his *Music of Changes* as follows:

Now for a little about accepting naturally,
 finally . It is a discipline, which accepted
 in return accepts whatever. (Leonard, 1994, p. 181)

Cage, during his studies on the Zen Buddhism learned to accept whatever comes in the life. He used this idea as well as in his works. In the *Music of Changes*, Cage accepted every cell of the sound or silence that matched up the hexagrams of the I Ching. The philosopher Lydia Goehr has observed that, in the chance-based works of Cage, “whatever changes have come about in our material understanding of musical sound, the formal constraints of the work-concept have ironically been maintained” (Taruskin, 2009, p. 275).

4.5.6 Interpretations of the Music of Changes

Since it is easier to comprehend more clearly all features, such as dynamics, durations, tempi, layers and sounds, generally the first book is analysed, even if the *Music of Changes* has four books. Therefore, in this thesis I analyzed five different performances & interpretations of the *Music of Changes*, Book I. The performers are David Tudor, Joseph Kubera, Martine Joste, Steffen Schleiermacher and Herbert Henck.

4.5.6.1 David Tudor’s interpretation

In my opinion, David Tudor’s interpretation is the most significant one under these three performances, which internalizes and reflects all the advices given by John Cage in the musical text. Compared with the other pianists, his approach is wilder and he has more vitality. The small valued notes such as thirty-seconds and sixty-fourths are played consequently rapid like the broken chords. He prefers to use the

⁷³Earle Brown: He was an innovative avant-garde composer from the group that emerged in the 1950s. He studied mathematic, composition and trumpet (Hill, 2006).

space even tighter and reduces the moments of silence, like in the first six measures of page 6. His interpretation is impatient, and this could be seen as a contradiction to the importance of silence for John Cage. However, I could feel the unpredictability, which was actually the main purpose of the composer, mostly in Tudor's performance. Especially in the first eight measures of page 5, I can hear a chain of much unexpected sounds; almost everything is surprising. The music in these measures as well as in pages 7 and 8 is flowing so naturally as if pulled by a magnet, nothing is arbitrarily accelerated nor decelerated. The contrasts between the dynamics are truly remarkable and his style is much accented. Furthermore, the sustained notes can be heard very clearly in the entire work. His duration is 3:56.

4.5.6.2 Joseph Kubera's interpretation

Compared with Tudor, Joseph Kubera's sound is rounder and has less sharpness. All small valued notes are played really limpid and understandable. The contrasts of dynamics are satisfying, even though the strict adherence to the texture is not fully presented like in the tremolo in page 2. The musical text is clear for the listener, and the sustained sounds can be heard enough. In the first eight measures of page 5, the most intensive rhythmic structure in the first book of *Music of Changes*, he steps very consistently and comprehensible, what, however, gives the feeling as if he wanted to forget the idea of unpredictability of John Cage. Although the faithfulness to the text is sometimes questionable, I could feel the aleatoric context of the piece in general. His duration is 4:18.

4.5.6.3 Martine Joste's interpretation

Among the recordings I studied for this dissertation, Martine Joste's interpretation has the most "cantabile"; which can be heard at the very beginning, on the triplets, in the third measure of page 1. Sometimes she accelerates the tempo too much, like at the closely apposed chords in the ninth and tenth measures of page 1; and this reduces the tension of the music. Even though the sustained sounds cannot be heard so clearly as in the other recordings, Joste is the one, who strives the roundest piano sound. She utilizes the space distinctly larger, and thus she can make more profit from the silence. When the contrasting dynamics are used at the same time in the different layers of the text, like in the third measure of page 3, she prefers to play

both in the same dynamic; and this causes the impoverishment of the contrast. In the first eight bars in page 5, which are played excellent by David Tudor, Joste seems to made benefit only from chaos. It sounds, as if she closed the eyes and hoped the best; finally, this makes her performance slightly imprecise. I felt generally that she plays really well learned, but for this reason, she loses the naturalness in her interpretation, as if she paid too much attention for playing properly and lost the attractiveness of the piece. Her duration is 4:02.

4.5.6.4 Steffen Schleiermacher

This is an interesting recording. Schleiermacher uses the time larger than Tudor, and he has a freer style than him. He plays clearly and comprehensible; but I never had the feeling that it is too slow and faltering. I think this recording presents the best balance between chaos and order. Also his piano sound can be placed between the ones of Tudor and Joste; it is not so much hard and accented, but also not so excessively cantabile and far from effective contrasts. As I wanted to follow the recordings on the score, I had some problems, especially with Tudor's energetic style. But Schleiermacher performs this work really calm and precise on the one hand, but also with appropriate contrasts and fluency. He shows respect for all small valued notes, but in a well-measured manner; therefore the trills and tremolos are very clear. His pedaling is good, it does not cover up the contrasts between different articulations. Maybe it is not the most surprising performance like Tudor's, and this is surely the longest one among the recordings I have heard; but it is definitely the well-balanced one, concerning the sound as well as the use of the space. His duration is 5:30.

4.5.6.5 Herbert Henck

Herbert Henck's performance of *Music of Changes* is very solid. As I listened to this recording, I instinctively recalled the performance of David Tudor. In his performance, I could hear the same wildness, and also the same impatience. The most obvious different to Tudor's performance is that he prefers to make use of transparency, even in wild passages; instead of chaos, which impressed me so much at Tudor's performance. The pedaling of Henck is also very transparent, he uses it economically. But the music sounds neither too thin nor too dry. His strict adherence

to the musical text, his aleatoric manner and the contrasts in his performance are imposing. His piano sound and his accented style are similar to David Tudor. He plays the small valued notes also too fast, like swinging a sword, but here I have to confess that I had an adrenalin rush. Therefore I found it very satisfying. His duration is 4:16.

4.5.6.6 Personal opinions on these interpretations

There is no doubt that it is an admirable job to interpret such a piece like *Music of Changes*, one of the most difficult and challenging compositions for piano in the twentieth century. This endeavor includes a long period of practicing as well as high concentration during the performance, which should not be lost, not even for a second. In my opinion, each performer, who faces this challenge, rightly commands great respect.

The performance of David Tudor is very impressive; his interpretation is consistent until the very last note. In this performance, the charm and beauty of this work are clearly present. Nearly all written advices in the score are perfectly realized. This is truly remarkable, when you think about the ages of this recording, where the recording technology and editing possibilities were much more primitive and limited. It is also astonishing that the adherence to the musical score never interrupts the natural flow of the performance. His interpretation is full of surprises, so that I felt myself in a dark room and saw various lights on a big wall, suddenly appearing and disappearing. Since it is the oldest recording here and it is not possible to hear the pedaling exactly, I cannot write many words about this point. Nevertheless, because of these reasons, this recording has in my opinion the finest quality between the performances I have studied for this dissertation.

The live recording of Joseph Kubera is really outstanding, although it includes some “accidents” in the whole performance, especially at the end of the Book II. He plays extremely concentrated and never loses the basic line in his interpretation. This is truly difficult to manage in such a long work of the modern repertory. Beside the abstraction, the comparability of his sound with electronic music is the most interesting point for me in his performance.

Martine Joste is a pianist, who wants to create a more delicate sound from the piano. In the passages, where she can manifest this aspect, her interpretation is colorful and

has more beauty than the other performances. This causes also a contrast to the rigorous energy in the character of the work. However, Joste wants to play this work very properly and therefore her interpretation is somehow static. This is my basic problem with this recording. It is certainly important that the small values and rapid passages are heard most clearly in this recording. On the other hand, I could not feel the constitutive connection between the first and the very last note, just because of this effort for playing decently. This reduces the attractiveness of the piece in my ears. Perhaps the excessive use of editing is another possible cause for the interruption of the natural flow. In my opinion, almost every “beautiful” moment of this music is underlined in this recording; but, according to the fact that everything exists with its opposite, the absence of the ugliness in this recording diminishes the basic energy of the work. Hence, the interpretation of Joste cannot reflect the full potential of *Music of Changes*.

The most impressive points in Steffen Schleiermacher’s performance for me were his sound and his calmness, both very well balanced. I think he could create the optimal piano sound for *Music of Changes*. Balance is obviously important for him, and he lets the music flow between the aggressive and silent passages. The significant difference to Martine Joste’s performance is that he makes use of calmness, but without “spelling” the phrases, although he plays the small valued notes with a certain clarity. His pedaling is also well balanced; it neither masks the different articulations and details, nor is it too thin. In my opinion, this is the best recording of *Music of Changes* to comprehend this work clearly.

The last recording, which I studied for this dissertation, is interestingly the closest one to the first analyzed recording. In fact, the approaches of David Tudor and Herbert Henck are very similar. I could feel the same energy, and the same steady course in both performances. Henck plays very vital, but at the same time with such a distance and professionalism, which made me think about the Variations op. 27 by Anton Webern. His choice to perform this work in a limpid way, quasi secco, may be one of the reasons for this. His pedaling is very clear; I thought he would use it only if it is surely necessary. This makes the music even more abstract in my ears. It is a fact that he knows exactly what he wants and his line is both consequent and surprising. He interprets the details truly precise and his recording gives the impression of a high level of professionalism.

5. CONCLUSION

While writing this dissertation, the approach of John Cage to the music as well as his perception of life and arts are examined. Starting with the European tradition, his professional career with major stages and his oeuvre are searched and analyzed. The results obtained after this process are presented respectively in the conclusion.

In the 1930s, when Cage felt the need to study music, he had two important names in his mind, Igor Stravinsky and Arnold Schoenberg. He chose Schoenberg because he was aware that Schoenberg loved teaching. Moreover, according to Cage, the music of Schoenberg was more preferable to the music of Stravinsky. After his decision, Cage went to Los Angeles to study with Schoenberg because he knew that studying with him “meant believing what he had to say” (Kostelanetz, 2003, p. 6). For two years, Cage had the opportunity to study one of the most important composer of the twentieth-century, who was associated with the expressionism and was the leader of the Second Viennese School.

As a composer, Schoenberg had an European tradition, and his harmony served in traditional western music. The rules of the harmony for Schoenberg was very important which was not the same for Cage. They studied for two years, until Cage understood that he did not take harmony seriously as Schoenberg did. He was completely interested in noise, and according to him, the harmony did not have anything to say about noise. Even if he studied with a master of western music, Cage did not have any feeling for the concepts of western harmony, and “the associated ideas of linear time and climax” had never existed for him. In the process of his composing, Cage may have thought the sense of Schoenberg as a basis of his studies, but over the years he developed his musical structure with a different focus. For instance, he divided the sounds and noises into four characteristics as pitch, loudness, timbre and duration. In addition, the silence had only one duration. Therefore, he devised “a rhythmic structure based on the duration, not of notes, but of spaces in time” (Small, 1996, p. 147). His rejection of pitch and harmony made him attempt to eliminate the composer’s will upon the work and allow sounds simply to be

themselves. Nevertheless, he gave the performer an opportunity for being a pre-composer and decide what to do in some cases.

Cage, as early as 1961, named himself as an anarchist. He never explained exactly what he ment by the appellation, but he was familiar, “in particular, with the work of the American anarchists” (Haskins, 2012, p. 104). According to Small (1996), Cage’s imposing any outside order on his sounds and noises, his use of the indeterminacy, the I Ching and chance operations “is clearly anarchistic”. Because as we know, anarchism does not mean *chaos*, “but indicates rather a state in which men *need*no externally imposed laws” (p. 149). Jaeger (2013) argued that the character of Cage’s anarchism “recalls his Zen-based cultivation of non-organization, in which all phenomena are considered interdependent, mutually accommodating, and non-hierarchical in value” (p. 153-154).

On the other hand, Cage may be thought as a composer who is the continuation of the *serialism*⁷⁴. He was “one of serialism’s main postwar alternatives” who sprang from the American experimentalism. With the other American composers like Morton Feldman, Christian Wolff and Earle Brown, “Cage sought to liberate the parameters of sound from hypercontrol of serialism by introducing chance and indeterminate procedures” (Woods, 1999, p. 182). Even if the compositional styles vary these composers such as Feldman, Wolff, Cage and Boulez, a common philosophyunites them: “a concentration upon unfamiliar relationships of space and time, and sound and silence, rather than on new melodies and chords, and a conviction that all musical relationships, whether arrived at by chance or by design, have potential value and are worth examination” (Cowell, 1991, p. 136). Cage had a considerable relation with Boulez for sharing his musical ideas. He says: “Boulez influenced me with his concept of mobility; my influence on him is that he accepts my idea of aggregates” (Kostelanetz, 1970, p. 103). The term mobility was expressed by Boulez (1991) as follows:

⁷⁴ Serialism: “Is a postwar development in musical thinking associated with European avant-garde of Boulez and Stockhausen, with electronic music” (Maconie, 2010, p. 331). In the serialism technique, “a structural series of notes governs the total development of the composition. It originated in Schoenberg’s atonality, leading to his system of composing with 12 tones” (Kennedy, Kennedy and Rutherford-Johnson, 2012, p. 773).

We must now define what is meant by dynamism or statis in the scale of sounds. It seems imperative to me that in twelve-tone technique entirely different procedures must be used to obtain equivalents of tonal values such as modulation; these procedures must be founded on the mobility or fixity of notes. In other words, mobility means that a note will appear in a different register on each of its occurrences; whilst fixity means that the contrapuntal line exists within a certain disposition of the twelve sounds in which each has its own determined place. (p. 50)

In fact, Boulez *Structure 1a* “is even closer in 1951 to a conception of chance than that which Cage had reached to this date” (Nattiez, 1995, p. 16). At the same year Cage was composing his *Music of Changes*, which “has many of the crystalline sounds and complex rhythmic patterns” Boulez’s *Structure 1a* (Ford, 2011, p. 126). There was an intense correspondence between Cage and Boulez. “As Boulez constructed ‘from scratch’, Cage constructed chance operations from scratch. It was to be the *idée fixe* of their lives” (Low, 2007, p. 141; Peyse, 1999, p. 226). According to Low (2007), their friendship “could be seen in their correspondence on the issue of chance”. However, in December 1951, in one of his letter to Cage, Boulez described *Music of Changes* and wrote “the only thing forgive me, which I am not happy with, is the method of absolute chance (by tossing the coins). On the contrary, I believe that chance must be extremely controlled” (Nattiez, 1995, p. 112). After Cage’s chance music, Boulez “developed an alternative to the same technique which he entitled ‘aleatory’ (denoting uncertain outcome; literally meaning ‘depending on the throw of a die’.)” (Broadhurst and Machon, 2012, p. 39), and Boulez’s aleatory became mentioned more than Cage’s chance music. As a result, their friendship became a quarrel, and this hostility continued into lifelong between these two composers.

“as a comPoser / i shouLd / glVe up / makiNg choicEs / Devote myself / to askIng / queStions / Chance / determIned / answers’ll oPen / my mind to worLd around / at the same tIme / chaNging my music / sElf-alteration not self-expression” (Cage, 1983, p. 132). The I Ching was the main source for Cage, which he consulted to organize his compositional choices concerning sounds/silences, durations, mobility/immobility, dynamics, layers, and durations. In fact, Cage was not interested in controlling the chance, but rather than in setting it free. The creation and the use of the charts were invaluable for him to obtain the musical materials, and they are surely products of his own compositional choices. After this period with pre-determining the charts, the indeterminacy through the chance operations came into

the process. From this perspective, it may be said that *Music of Changes* or other works composed with the I Ching are not completely indeterminate. However, as Cage wholly accepted the answers came from the I Ching, the combining of the various materials in the structure of these works is constituted in a totally indeterminate manner.

Through using the devices such as I Ching, coin tosses and star maps, Cage systematized his own compositional choices and revealed such a freedom, from which also the performers can benefit. He offered the opportunity for the performers to determine on some points, which in some cases is even not given to the composers in their own creating process.

Before starting to write this dissertation, I thought that Cage had employed the I Ching, Book of Changes with its text. My opinion was that Cage threw the coins for the meaning of the text of the Book of Changes. In that way, he could create a music with the history and explanation of the text which belong to each hexagram. If I were a composer, who wanted to compose by the help of the I Ching, I could observe the Book of Changes with a deep sense which tries to comprehend the real meaning of the text. Thus, I could create a music which related to each hexagram, by its text and history. But Cage, who was one of the composers in the history of music, who had started to interest in the Eastern philosophy, particularly Zen Buddhism and Indian philosophy to remove his ego and his personal likes and dislikes from his compositions, applied the I Ching only to create a mathematical system. He organized the numbers, cells and charts according to the numerical order of the I Ching. He made use of the number sixty-four by dividing into two, six and eight, etc, and thus, he constituted his compositional processes. He worked out on Eastern philosophy, had an intense friendship with Gita Sarabhai and learned the Indian philosophy from her, and took lessons from D. T. Suzuki on Zen Buddhism. However, during my research, I have encountered some articles, interviews and writings, which made me feel that Cage actually was not a composer/person who understood the main theme of the I Ching. As a researcher, it is not correct being biased, but as a pianist/person, who has interested in the I Ching since thirteen years, I could tell that, in these materials, there are some points which reveals that, although Cage thought to be a person who removed his ego, it was clearly seen that he carried traces of his ego and a wide arrogance, like the other artists who liked to feel the lust of carrying them.

One of the most important phenomenon in the Eastern philosophy is the notion of *nothingness*. For instance, in Buddhism, everything is nothing, and nothing is everything. For Buddhists, the being of existence is a nothing, because according to them, the negativity and the positivity are the same thing, as in Taosim nothing is defined as the opposite of something (Terzidis, 2015). On the other hand, in the philosophy of the I Ching the *Yin* and *Yang* are the main notions. Everything changes like “*yin* changes to *yang*, and *yang* changes to *yin*”. Many Asian religions and philosophies the I Ching, Confucianism, Buddhism, and Taosim “maintain that everything is changing” (Rhee, 2007, p. 104). Cage, taking the road from here, employed the mobility in his works composed with the I Ching. While the Western composers wrote music by their personal organizations, since they believed in self-organization and progress, Cage preferred creating with the I Ching, in which, the philosophy of controlling by the upper consciousness was existed. However, Cage’s music was criticised by many composers, musicians, and critics. It was argued that everyone could compose with the system of Cage, because he did not have any purpose for this experimental music, except creating sounds. In one of the interviews made with Cage, the interviewer asked him whether his creations are musics or not, and Cage’s response was as follows:

Ah you like sounds after all when they are made up of vowels and consonants. You are slow-witted, for you have never brought your mind to the location of urgency. Do you need me or someone else to hold you up? Why don't you realize as I do that nothing is accomplished by writing, playing, or listening to music? Otherwise, deaf as a doornail, you will never be able to hear anything, even what's well within earshot.(Cage, 1961, p. 17)

French-born composer Edgard Varèse (1883-1965), coined the term *organized sound* to describe his music. “His use of this term reflects in particular his insistence on the musical potential of an expanding ‘palette’ of possible sounds for use in the concert hall, in particular new kinds of percussion, electronically generated sounds, and recorded sounds” (Landy, 2007, p. 10). “If this word ‘music’ is sacred and reserved for eighteenth- and nineteenth-century instruments” it could be substituted a more meaningful term organization of sound (Voegelin, 2014, p. 125).

Cage was a composer who adopted this philosophy for his music and new creations, after his lecture *The Future of Music: Credo*, which was given in 1937. In this essay, Cage argued that the music does not have to serve only for the traditional music and tonality, but also for the noises and the other shapes of possible sounds. He

underlined the need for noise and the sounds which may be heard everyday, in our daily life. In addition, to create new sound sources, he made in use the technology. Cage's compositions like silence were used to attempt to expand the traditional music with other sounds, and he opened new doors through his esoteric knowledge. In the development of Cage's music, it is seen that he did not have a conceptional art, on the contrary, his issue was to extend the limitations of music. His concepts of silence and chance operations crossed the disciplinary of the eighteenth- and nineteenth-century music. Some critics argue that Cage's indeterminacy in music is a continuation of Arnold Schoenberg's twelve-tone technique. It could be true, because Cage's music consisted of convenience sounds and mathematical structures as in the music of Schoenberg's serialism.

Music of Changes is a work of a composer, who grounded all the innovations for a pianist on such a book as the I Ching, which derives from changes. Sounds, chords, harmonies, rhythms as well as the density form together a *perpetuum mobile*, in spite of the included silences. This dynamism and continuity, which keep the concentration and focus of the listener, make me feel that John Cage composed a work, which underlines the changes that live brings and the eternity of this process. Beside the differences between the interpreters analyzed for this dissertation, I permanently hear the reflections of the feelings in human soul such as aggression, calmness, astonishment, resolution, fearfulness and thoughtfulness. Perhaps I hear all this, because I think that it is not that easy to accept and to apply the changes, neither in the life nor in the music. Cage could put all these expressions and feelings springing from the changes in a single instrument. He used the piano truly like an orchestra; he enforced and extended its potential. Not only the instrument itself, but also the performers of this work are faced with a huge challenge. To be able to perform *Music of Changes*, the interpreters have to take mathematic lessons (like David Tudor); they all feel themselves as a chronometer, they are all conducted to obtain diverse sounds from all corners of the piano, and they all have to feel the sound and the silence deep in their bodies and souls. From my point of view, John Cage is a composer, who never stopped fighting with himself, steadily searched for undiscovered facts, and insisted on comprehending his innovations by the performers as well as the composers.

The ideas, such as *organized sounds* by Varèse and *noise* as Cage utilize it, are two of the most quoted approaches in the milieu of contemporary music. Cage's sound categorization (pitch, timbre, loudness and duration) and the concept of 'the opposite and necessary coexistent of sound, silence' have opened the world of many people to new possibilities and demonstrated what music can also be. His importance is not only limited with *indeterminacy* in music, perhaps more impact have been derived from his sonic exploration and extension of the piano with *The Seasons* and *Preludes*. Those pieces are astonishing in timbral quality, comparing to what have been composed with the very same instrument for at least a century by the other composers. Later on, his non-decisive composition period (which was longer than the other) had a significant effect on shaping pseudo-improvisational approach, which tries to merge real time creativity and structured thinking.

Cage was an obstinate character, whom had fought against himself and what he has created. In my opinion, many of his works are the witnesses of that process, like some of the post-modern artists and science man such as Duchamp, Gödel or Sartre. He has terminated the role of coherency not in music but in all the performing arts. Therefore, this is his 'mushroomisation' (not sure whether there is such a word but what I mean is the process of decaying and creating the mushroom from his own works), perhaps not randomly enough in his life.

I personally listen to Cage occasionally, but read more what he has written and what has been written on his works. This dilemma is a natural continuum that created by the composer. Perhaps, music is not a legitimate descent and therefore no more Cage himself, but Cage in everywhere.

The musical philosophy, which John Cage presented in his works and explained in his lectures as well as interviews, is in fact revolutionary. His ideas were highly courageous and certainly ahead of his time. I would honestly prefer to experience more composers nowadays, who are able to seek for really alternative ways of thinking and composing as Cage consequently was, instead of falling back to the formal conventions of the sound in the past.

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APPENDICES

APPENDIX A: TABLES

APPENDIX B: GLOSSARY

APPENDIX A: Tables

Table A.1: John Cage's complete work list.

Apprenticeship period (1932–36)
Greek Ode, for voice and piano (1932)
First Chapter of Ecclesiastes (The Preacher), for voice and piano (1932, possibly incomplete)
Three Easy Pieces (1. Round in A minor, 2. Duo in G major, 3. Infinite canon in F minor), for piano (1933)
Three Songs for voice and piano, (1932–33)
Sonata for Clarinet (1933)
Sonata for Two Voices, for two instruments with specified ranges (1933)
Composition for 3 Voices for three unspecified instruments (1934)
Solo with obbligato accompaniment of two voices in canon, and six short inventions on the subjects of the solo, for three or more instruments (1934, six inventions revised 1958)
Three pieces, for two flutes (1935)
Quartet, for any four percussion instruments (1935)
Two pieces, for piano (1935?, revised 1974)
Five Songs, alto and piano, 1938
Trio, for three percussionists (1936)
Modern dance, prepared piano, and the transition to chance (1937–51)
Metamorphosis, for piano (1938)
Five Songs, for contralto soloist and piano (1938)
Music for Wind Instruments, for wind quintet (1938)
Imaginary Landscape No. 1, for two variable-speed phono turntables, frequency recordings, muted piano and cymbal (1939)
First Construction (in Metal), for six percussionists with an assistant (1939)
Second Construction, for four percussionists (1939–40)

Continued

Table A.1 (Continued): John Cage's complete work list.

Bacchanale, for prepared piano (1940)
Imaginary Landscape No. 2 (first version), for tape, string piano and percussion (1940, withdrawn by Cage)
Fads and Fancies in the Academy, for five performers with various objects (1940)
Living Room Music, for percussion and speech quartet (1940)
A Chant With Claps, for voice (1940?, possibly c. 1947 or 1949–50)
Dance Music: for Elfrid Ide, for percussion ensemble and piano (1940)
Opening Dance for Sue, for piano (1940–41)
Third Construction, for four percussionists (1941)
Dance to the West, for piano (1942)
Forever and Sunsmell, for voice and two percussionists (1942)
Totem Ancestor, for prepared piano (1942)
Jazz Study, for piano (1942, spurious work possibly not by Cage)
Imaginary Landscape No. 3, for six percussionists (1942)
Imaginary Landscape No. 2 (March) (1942, first title Imaginary Landscape No. 4)
The City Wears a Slouch Hat, for narrator and six percussionists (1942)
Credo in Us, for four performers with various objects (1942)
And The Earth Shall Bear Again, for prepared piano (1942)
The Wonderful Widow of Eighteen Springs, for voice and closed piano (1942)
Primitive, for prepared piano (1942)
In the Name of the Holocaust, for prepared piano (1942)
Ad lib, for piano (1943)
Our Spring Will Come, for prepared piano (1943)
A Room, for piano or prepared piano (1943, originally third part of She is Asleep)

Continued

Table A.1 (Continued): John Cage's complete work list.

She Is Asleep: 1. Quartet for percussion, 2. Duet for voice and prepared piano (1943)
Amores, for percussion and prepared piano (1943)
Four Dances (What So Proudly We Hail), for voice and prepared piano (1943)
Tossed As It Is Untroubled, for prepared piano (1943, first title Meditation)
Triple-Paced No. 1, for piano (1943)
Four Walls, for piano and voice (in one of the movements) (1944)
Prelude for Meditation, for prepared piano (1944)
Root of an Unfocus, for prepared piano (1944)
Spontaneous Earth, for prepared piano (1944)
The Unavailable Memory of, for prepared piano (1944)
Triple-Paced No. 2, for prepared piano (1944)
The Perilous Night, suite for prepared piano (1944)
A Valentine Out of Season, for prepared piano (1944)
A Book of Music, for two prepared pianos (1944)
Crete, for piano (1944–45)
Dad, for piano (1944–45)
Mysterious Adventure, for prepared piano (1945)
Soliloquy, for piano (1945, originally part of Four Walls)
Experiences No. 1, for two pianos 4 hands (1945)
Three Dances for two prepared pianos (1945)
Daughters of the Lonesome Isle, for prepared piano (1945)
Ophelia, for piano (1945)
Prelude for six instruments in A minor for flute, bassoon, trumpet, violin, cello and piano (1946, an arrangement of the second piece from Two Pieces for piano of 1946)

Continued

Table A.1 (Continued): John Cage's complete work list.

Two Pieces, for piano (1946)
Music for Marcel Duchamp, for prepared piano (1947)
Nocturne, for violin and piano (1947)
Ballet The Seasons, versions for piano and for orchestra (1947)
Dream, for piano or viola and ensemble of 4 violas (1948)
Experiences No. 2 for voice (1948)
In a Landscape for piano or harp (1948)
Sonatas and Interludes, for prepared piano (1946–48)
Suite for Toy Piano, for toy piano or piano (1948)
A Flower, for voice and closed piano (1950)
Works of Calder, film score for prepared piano and tape (1950)
String Quartet in Four Parts, for string quartet (1949–50)
Six Melodies, for violin and keyboard instrument (1950)
Concerto for prepared piano, for prepared piano and chamber orchestra (1950–51)
Haiku [5], for piano (1950–51)
First chance works (1951–59)
Sixteen Dances for flute, trumpet, 4 percussionists, piano, violin and cello (October 1950 – January 1951)
Imaginary Landscape No. 4 (March No. 2), for 12 radios, 24 performers and a conductor (April 1951)
<i>Music of Changes</i> , for piano (May – December 1951)
Seven Haiku, for piano (July 1951 – 1952)
Waiting, for piano (January 7, 1952)
Imaginary Landscape No. 5 for any 42 recordings (January 12, 1952)
Two Pastorales, for piano or prepared piano (January 31, 1952)

Continued

Table A.1 (Continued): John Cage's complete work list.

Water Music for pianist using various objects (Spring 1952)
For M.C. and D.T., for piano (1952, before August)
Music for Carillon No. 1, for carillon (July 10, 1952; 2- and 3-octave transcriptions made in 1958 and 1961, respectively)
4'33" for any instrument or combination of instruments (August 1952, second version 1962)
Music for Piano 1, for piano (December 1952)
Williams Mix, for tape (1952–53, finished on January 16, 1953)
Music for Piano 2, for piano (May 1953)
Music for Piano 4–19, for any number of pianos (May 1953)
Music for Piano 3, for piano (June 1953)
59½" For a String Player, for any 4-string instrument (July 2, 1953)
Music for Piano 20, for piano (August 20, 1953)
Music for Carillon No. 2, for carillon (January 1954; 2-octave version made in January 1961)
Music for Carillon No. 3, for carillon (January 1954; 2-octave version made in January 1961)
34'46.776" For a Pianist, for prepared piano (1954, before October 17)
31'57.9864" For a Pianist, for prepared piano (1954, before October 17)
26'1.1499" For a String Player, for string instrument (1953–55, finished in August – September 1955)
Music for Piano 21–36, 37–52, for piano solo or in an ensemble (1955, finished on October 11)
Speech 1955, for news reader and 5 radios (November 1955)
27'10.554" For a Percussionist, for percussion (January 14, 1956)
Music for Piano 53–68, for piano solo or in an ensemble (May 1956)
Music for Piano 69–84, for piano solo or in an ensemble (May 1956)

Continued

Table A.1 (Continued): John Cage's complete work list.

Radio Music, for 1 to 8 performers using radios (May 1956)
Winter Music, for piano (January 1957)
For Paul Taylor and Anita Dencks, for piano (September 1957)
Haiku, for any instruments or objects (January 1958)
Variations I, for any number of performers and any kind and number of instruments (January 20, 1958)
Concert for piano and orchestra (1957–58, finished before May 15)
Solo for Voice 1, for voice (1958, before May 25)
Music Walk, for piano and various objects (September 24, 1958)
TV Köln, for piano, optionally with other objects (October 1958)
Fontana Mix, for tape (November 1958)
Aria, for voice (November or December 1958)
Happenings, theater (1959–68)
Sounds of Venice, for television set (one performer) (1959)
Water Walk, a work for a TV show for one performer with a variety of objects (1959)
Cartridge Music, for amplified sounds (1960)
Music for Amplified Toy Pianos, for any number of toy pianos (1960)
Music for "The Marrying Maiden" (music for a play), for tape (1960)
Solo for Voice 2, for solo voice or chorus (1960)
Theatre Piece, for 1 to 8 performers (1960)
WBAI (1960) – auxiliary score for performance with other works
Where Are We Going? And What Are We Doing?, composed lecture, tapes (1960–61)
Atlas Eclipticalis for an ensemble of 86 instruments (1961–62)
Music for Carillon No. 4, for electronic instrument with accompaniment (1961)

Continued

Table A.1 (Continued): John Cage's complete work list.

Variations II, for any number of performers and any kind and number of instruments (1961)
Music for Piano 85, for piano and electronics (1962)
Variations III, for any number of people performing any actions (1962)
0'00" (4'33" No. 2), solo for any performer (1962)
Variations IV for any number of performers, any sounds or combinations of sounds produced by any means, with or without other activities (1963)
Electronic Music for Piano, for solo piano (or any number of pianos) with electronics (1964)
Rozart Mix, tape loops (1965)
Variations V (1965)
Variations VI, for a plurality of sound systems (1966)
Music for Carillon No. 5, for a four-octave instrument (1967)
Variations VIII, no music or recordings (May 1967; revised 1978)
Variations VIII, no music or recordings (May 1967; revised 1978)
Return to composition (1969–86)
HPSCHD, for 1 to 7 amplified harpsichords and 1 to 51 tapes (1967–69, accompanied with Program (KNOBS) for the listener, an instruction for playing back the recording of the piece)
Cheap Imitation, for piano (1969; orchestrated 1972, violin version 1977)
Sound Anonymously Received, for an unsolicited instrument (1969, possibly 1978)
Untitled (Work for Antoinette Vischer), for harpsichord (before 1969)
Dialog, for two performers with various objects (1970, possibly 1977; also known as Dialogue)
Song Books (Solos for Voice 3–92), for one or more voices (August – October 1970, Solo for Voice 85 arranged for violin as Chorals in 1978)
Mureau, for one or more speakers and tape ad lib (November 1970)

Continued

Table A.1 (Continued): John Cage's complete work list.

WGBH-TV, for composer and technicians (1971)
Bird Cage, for 12 tapes (April 1972)
Etcetera, for small orchestra, tape and, optionally, 3 conductors (August 1973)
Exercise, for an orchestra of soloists (November 1973, based on Etcetera; second version completed in December 1984)
Etudes Australes, for piano (1974–75, finished in December)
Score (40 Drawings by Thoreau) and 23 Parts, for 23 performers; any instruments and/or voices (August 1974)
Child of Tree (Improvisation I), for percussion made of plants and/or plants used as percussion (1975, before March 8)
Lecture on the Weather, lecture for 12 voices and tapes (September 1975)
Renga, 78 parts for any instruments and/or voices (1975–76, finished in April)
Quartets I–VIII, for orchestra (1976, after August. Three versions for 24, 41, and 93 performers. Arranged for 12 amplified voices and concert band in 1978)
Branches, for percussion made of plants or plants used as percussion (1976)
Telephones and Birds, for three performers (1977, before January 18)
49 Waltzes for the Five Boroughs, for performer(s), or listener(s), or record maker(s) (1977, before October 6)
Freeman Etudes, for violin (1977–80, 1989–90)
Inlets (Improvisation II), for four performers with conch shells and the sound of fire (September 1977)
Cassette for five performers with any number of tapes (1977, before December 7.
lla ricerca del silenzio perduto (Il Treno), for "prepared train" (December 1977)
A Dip in the Lake: Ten Quicksteps, Sixty-two Waltzes, and Fifty-six Marches for Chicago and Vicinity, for performer(s) or listener(s) or record maker(s) (1978, before May)
Some of the "Harmony of Maine", for organist and three assistants (November 12, 1978)

Continued

Table A.1 (Continued): John Cage's complete work list.

Etudes Boreales, for cello and/or piano (1978)
Hymns and Variations, for twelve amplified voices (January 1979)
Roaratorio, an Irish circus on Finnegans Wake, tape (April – September 1979; a realization of _____, _____ circus on _____, a set of instructions on transcribing any book for any ensemble)
Improvisation III, for four or more cassette players (February 1980)
Furniture Music Etcetera, for two pianos (April 27, 1980; partly based on Etcetera)
Litany for the Whale, for two voices (July 1980)
Thirty Pieces for Five Orchestras, for five orchestras (1981, before November 22)
Instances of Silence, for any number of cassette players and tapes (1982, before March 16)
Postcard from Heaven, for 1 to 20 harps (June 1982)
Improvisation IV (Fielding Sixes), for three cassette players (1982, before June 30)
Dance/4 Orchestras, for four orchestras (1982, before August 22)
Fifteen Domestic Minutes, for record players at different radio stations (August 1982)
An Alphabet, radio play (1982)
ear for EAR (Antiphonies), for voices (possibly January 20, 1983)
Ryoanji, for double bass, trombone, oboe, voice, percussion, small orchestra (1983; parts added in 1983–85, and an unfinished cello part survives from 1992)
R/13 (where R=Ryoanji), for percussionist with thirteen found objects (July 26–28, 1983)
Souvenir, for organ (September 1983)
Thirty Pieces for String Quartet, for string quartet (September 1983)
HMCIEEX, tape for radio (1983–84)
Perpetual Tango, for piano (February 1984)
Haikai, for flute and zoomoozophone (July 1984)

Continued

Table A.1 (Continued): John Cage's complete work list.

Nowth upon Nacht, for voice and piano (July 1984)
A Collection of Rocks, for choir and orchestra (October 1984)
Eight Whiskus, for low voice (November 21, 1984; reworked for violin in March 1985)
Mirakus 2, for voice (November or December 1984)
Selkus 2, (November or December 1984)
ASLSP, for piano or organ (January 1985)
Sonnekus 2, for voice (February 1985)
The first meeting of the Satie society the socie satiety, for two speakers, one female singer, musicians and/or tapes (January – March 1985)
But what about the noise of crumpling paper which he used to do in order to paint the series of "Papiers froissés" or tearing up paper to make "Papiers déchirés?" Arp was stimulated by water (sea, lake, and flowing waters like rivers), forests, for percussion ensemble (August 1985)
Etcetera 2/4 Orchestras, for four orchestras and tape (December 1985)
Voiceless Essay, for four computer-generated tapes (1985–86)
Wishing Well, for four speakers (early 1986)
Hymnkus, for voice and chamber ensemble (1986, probably before May 14)
Improvisation A+B, for voice, clarinet, trombone, percussion and orchestra (1986, before May 14)
Rocks, for various electronic devices (May 5, 1986)
Haikai, for gamelan ensemble (October 1986)
Number Pieces and other late works (1987–92)
Music for _____, seventeen parts with no score, for a variable chamber ensemble (1984–87)
Essay (Writing through the Essay "On the Duty of Civil Disobedience"), for computer-generated tapes (1987–88)
Two, for flute and piano (April 1987)

Continued

Table A.1 (Continued): John Cage's complete work list.

Organ2/ASLSP, for organ (June 1987)
One, for piano (December 1987)
Europaras 1 & 2, for 19 voices and 21 musicians (1987, Europaras include a piece for tape called Truckera, also 1987)
Five, for any five instruments or voices (January 1988)
Solos for Voice 93–96 (Four Solos for Voice), for voice(s) (April 1988)
Seven, for flute, clarinet, percussion, piano, violin, viola and cello (May 1988)
Twenty-Three, for 13 violins, 5 violas and 5 cellos (1988, before June 21)
Five Stone Wind, for three performers with clay drums, electronics and unspecified instruments (June – July 1988)
101, for orchestra (1988, before November 13)
Four, for string quartet (1989, before May 9)
One2, for 1 to 4 pianos (summer 1989)
Three, for three recorders (July 1989)
Two2, for two pianos (1989, after July 28)
One3, for solo performer (late 1989)
Sculptures Musicales, for electronics (1989, before September 23)
Sports: Swinging, after Satie, for piano (1989)
The Beatles 1962–1970, piano and, optionally, tape (1990, possibly 1989)
c Composed Improvisations, for bass guitar, snare drum and one-sided drums with or without jangles (1987–90)
One4, for solo drummer (1990)
Fourteen, for piano, flute/piccolo, bass flute, clarinet, bass clarinet, horn, trumpet, 2 percussionists, 2 violins, viola, cello and double bass (1990, before May 12)
One5, for piano (May 1990)

Continued

Table A.1 (Continued): John Cage's complete work list.

Europeras 3 & 4, for 6 voices, 2 pianos, 12 victrolas and tape (1990, Europeras include a piece for tape called Truckera, composed 1987)
One6, for violin (June 1990)
Seven2, for bass flute, bass clarinet, bass trombone, two percussionists with unspecified instruments, cello and contrabass (1990, before July 23)
One7, for any sound-producing object (late 1990)
Scottish Circus, for Scottish folk band of any number of musicians and any instruments/voices (September 1990)
Four2, for SATB choir (October 1990)
One8, for cello (April, 1991)
108, for orchestra (April 1991)
Europera 5, for 2 voices, piano, victrola, tape/TV/radio (1991, before April 12)
Eight, for flute, oboe, clarinet, bassoon, horn, trumpet, tenor trombone and tuba (1991, before May 14)
Three2 for three percussionists with unspecified instruments (May 1991)
Four3, for one or two pianos, twelve rainsticks and violin/oscillator, all operated by four performers (May 1991)
Five2, for English horn, 2 clarinets, bass clarinet and timpani (May 1991)
Lullaby, for musical box (May 1991)
One9, for shō (July 1991)
Two3, for shō and five conch shells (July 1991)
Two4, for violin and piano or shō (July 1991)
Six, for six percussionists with unspecified instruments (September 1991)
103, for orchestra (September 1991)
Two5, for piano and tenor trombone (October 1991)
Four4, for percussionists with unspecified instruments (October 1991)
Four5, for four saxophones (October 1991)

Continued

Table A.1 (Continued): John Cage's complete work list.

Five3, for trombone and string quartet (October 1991)
Five4, for soprano saxophone, alto saxophone and 3 percussionists (October 1991)
Five5, for flute, 2 clarinets, bass clarinet and percussion (October 1991)
Five Hanau Silence, for tape (October 1991)
Ten, for flute, oboe, clarinet, trombone, percussion, piano, 2 violins, viola and cello (October – November 1991)
Twenty-Six, for 26 violins (December 1991)
Twenty-Eight, for wind ensemble (December 1991)
Twenty-Nine, for two timpani, two percussionists, piano and strings (December 1991)
Twenty-Eight, Twenty-Six and Twenty-Nine, for orchestra (December 1991, a combination of Twenty-Six, Twenty-Eight and Twenty-Nine)
Mozart Mix, for five cassette players (1991)
One10, for violin (February 1992)
Sixty-Eight, for orchestra (February 1992)
Eighty, for orchestra (February 1992)
Four6, for four performers with any means of producing sounds (March 1992)
Seventy-Four, for orchestra (March 1992)
Fifty-Eight, for wind orchestra (March 27, 1992)
Two6, for violin and piano (April 1992)
Thirteen, for flute, oboe, clarinet in B-flat, bassoon, trumpet in C, tenor trombone, tuba, 2 percussionists, 2 violins, viola and cello (May 14, 1992)
Muoyce II (Writing through Ulysses), for speaker and tapes (May 1992)
One11, for solo cinematographer (1992)
One12, for solo lecturer (1992, before June 22)
Arrangements

Continued

Table A.1 (Continued): John Cage's complete work list.

Arrangement of Socrate (Erik Satie) (1944 or 1947)
Adaptation of Ixion (Morton Feldman) for chamber ensemble or 2 pianos (1958)
Collage of some Studies for Player Piano (Conlon Nancarrow) on tape (1964)
Adaptation of some Studies for Player Piano (Conlon Nancarrow) (1969)
Unfinished and incomplete works
Quest, for various objects (first movement) and piano (second movement) (1935, only the second movement survives)
Chess Pieces, for piano (1943)
Encounter, for piano (1946)
Unfinished work for voice (1953)
Unfinished work for magnetic tape (c. 1952–53)
Sixteen, for flute, oboe, clarinet, bassoon, horn, trumpet, trombone, bass trombone, piano, 2 percussionists, 2 violins, viola, cello and double bass (1992)
Lost works
Untitled composition, 1931
Etudes, for piano (1932, possibly same as the untitled composition of 1931)
Duet, for two flutes (1934)
Music for Xenia, for piano (1934)
Allemande for clarinet (1934)
String Quartet (1936)
Music for an Aquatic Ballet (1938)
25 Ballets in 1 act for a solo dancer (1939)
Ho to AA, for voice and piano (1939)
America was promises, for voice and piano 4 hands (1940)
Four songs of the moment, for piano (1940)

Continued

Table A.1 (Continued): John Cage's complete work list.

Prelude to Flight, for piano? (1940)
Spiritual, for piano (1940)
Opening dance, for piano (1942)
Shimmera, for prepared piano (1942)
Lidice, for prepared piano (1943)
The Feast, for piano (1945)
Thin Cry, for piano (1945)
Foreboding, for piano (1946)
Orestes, for piano? (1948)
Untitled (work for Joao Miró), for piano (1970)
Music for "Westbeth", for piano? (1974)
Pools, for a single performer (1978, based on Inlets)
Seventeen, (1992, possibly similar to Sixteen or does not exist)
Otte, for violin (1992, spurious, probably not by Cage or does not exist)
Literary works
Silence: Lectures and Writings (1961)
A Year from Monday (1968)
M (1973)
X (1983)

Table A.2: John Cage's computer programs by Andrew Culver.

Name	Description	Year
ic	generic command-line I Ching number generator, with options: sort, non-repetition, bias, immobile bias	84-93
tic	a time values specific version of ic	84-93
Notes: ic and tic are both DOS programs written in the C language		
Programs used by John Cage		
Name	Description	Year
babbrook	generated record player and sound mixer parts for production of <i>Truckera</i> (named after Brooke Wentz with reference to a "babbling brook" of singers)	87
chairbar	generated chair positions for Barcelona <i>Essay</i> installation	91
flatcues ²	generated the time plan for the flat movements of <i>Europas 1 & 2</i>	87
ic	generic command-line I Ching number generator, with options: sort, non-repetition, bias, immobile bias	84-93
imagecue ²	generated image selections for the Frankfurt flats of <i>Europas 1 & 2</i>	86
lghtcues ²	first generation (Frankfurt) <i>Europas 1 & 2</i> light cue generation program	88
lieop	light event generation for <i>Europas 1 & 2</i>	91
liess	light event generation for <i>Essay</i>	90
lilcu	newer and more general light cue compilation program	90-91
mattress	generated chair and artwork positions for the changing installation at the mattress factory	91

Continued

Table A.2 (Continued): John Cage's computer programs by Andrew Culver.

Meso	combines all mesostic routines in one program (incomplete)	89
mesolist ¹	finds all the words in a source text that match all the letters in a string	84
mesomake ¹	takes a source text and a string of letters and produces a "writing through" mesostic	84
Mesorule	tests a mesostic for conformity with the 50% rule	88
Mlcount	counts the number of words found for each meso letter by mesolist	85
Mlfind	finds one word for each meso letter in a mesolist list	85
Muoyce	used to generate performance times for <i>Muoyce</i>	91
Musicfor	generates time brackets, pitches, dynamics, specials for the <i>Music for . . .</i> series	88
Piaggs	lists all three, four, or five note piano aggregate stretches	84,89
Rengamix	chance mixes a group of mesostics with identical strings	85
Tb	generic time bracket generation, used for most of the numbered pieces	90-91
Tic	a time values specific version of ic	84-93
Yroverx	generates pencil sizes and stone selections for the <i>Ryoanji</i> series of drawings	87
All programs by Andrew Culver in the C language except 1. by Jim Rosenberg in the C language 2. supplementary routines written in the ZIM database language		

Continued

Table A.2 (Continued): John Cage's computer programs by Andrew Culver.

Programs for the Posthumous Continuation of John Cage's work		
Name	Description	Year
euopera	production/performance software for <i>Euopera 3</i> & <i>4</i> and <i>Euopera 5</i>	92-93
rover	software for running <i>Rolywholyover A Circus</i>	93
Notes: • euopera written in the Paradox Application Language (PAL) with calls to I Ching routines in C • rover written in Paradox for Windows application (ObjectPAL) with calls to I Ching routines in C • euopera is published by C.F.Peters Corp., New York. www.edition-peters.com		

Table A.3: Richard Wilhelm's list of eight symbol.

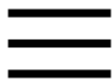
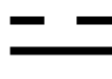
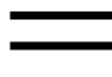
Symbol	Name	Attribute	Image	Family Relationship
 Ch'ien	the Creative	strong	heaven	father
 K'un	the Receptive	devoted, yielding	earth	mother
 Chên	the Arousing	inciting, movement	thunder	first son
 K'an	the Abysmal	dangerous	water	second son
 Kên	Keeping Still	resting	mountain	third son
 Sun	the Gentle	penetrating	wind, wood	first daughter
 Li	the Clinging	light-giving	fire	second daughter
 Tui	the Joyous	joyful	lake	third daughter

Table A.4: The Chinese names and Richard Wilhelm's translations of the sixty-four hexagrams.

1. Chien - The Creative / Force	2. Kun - The Receptive / Field
3. Chun - Difficulty at the Beginning / Sprouting	4. Meng - Youthful Folly / Enveloping
5. Hsü - Waiting (Nourishment) / Attending	6. Sung - Conflict / Arguing
7. Shih - The Army / Leading	8. Pi - Holding Together [union] / Grouping
9. Hsiao Chu - The Taming Power of the Small / Accumulating Small	10. Lü - Treading [conduct] / Treading
11. Tai - Peace / Pervading	12. Pi - Standstill [Stagnation] / Obstruction
13. Tung Jen - Fellowship with Men / Concurring People	14. Ta Yu - Possession in Great Measure / Great Possessing
15. Chien - Modesty / Humbling	16. Yü - Enthusiasm / Providing-for
17. Sui - Following / Following	18. Ku - Work on what has been spoiled [decayed] / Corrupting
19. Lin - Approach / Nearing	20. Kuan - Contemplation (View) / Viewing
21. Shih Ho - Biting Through / Gnawing Bite	22. Pi - Grace / Adorning
23. Po - Splitting Apart / Stripping	24. Fu - Return (The Turning Point) / Returning
25. Wu Wang - Innocence (The Unexpected) / Without Embroiling	26. Ta Chu - The Taming Power of the Great / Great Accumulating
27. I - Corners of the Mouth (Providing Great Exceeding Nourishment) / Swallowing	28. Ta Kuo - Preponderance of the Great / Great Exceeding
29. Kan - The Abysmal (Water) / Gorge	30. Li - The Clinging, Fire / Radiance

Continued

Table A.4 (Continued): The Chinese names and Richard Wilhelm's translations of the sixty-four hexagrams.

31. Hsien - Influence (Wooing) / Conjoining	32. Heng - Duration / Persevering
33. Tun - Retreat / Retiring	34. Ta Chuang - The Power of the Great, Great Power / Great Invigorating
35. Chin - Progress / Prospering	36. Ming I - Darkening of the light / Brightness Hiding
37. Chia Jen - The Family [The Clan] / Dwelling People	38. Kuei - Opposition / Polarising
39. Chien - Obstruction / Limping	40. Hsieh - Deliverance / Taking-Apart
41. Sun - Decrease / Diminishing	42. I - Increase / Augmenting
43. Kuai - Break-through (Resoluteness) / Parting	44. Kou - Coming to Meet / Coupling
45. Tsui - Gathering Together [Massing] / Clustering	46. Sheng - Pushing Upward / Ascending
47. Kun - Oppression (Exhaustion) / Confining	48. Ching - The Well / Welling
49. Ko - Revolution (Molting) / Skinning	50. Ting - The Cauldron / Holding
51. Cheng - The Arousing (Shock, Thunder) / Shake	52. Ken - Keeping Still, Mountain / Bound
53. Chien - Development (Gradual Progress) / Infiltrating	54. Kuei Mei - The Marrying Maiden / Converting The Maiden
55. Feng - Abundance [Fullness] / Abounding	56. Lü - The Wanderer / Sojourning
57. Sun - The Gentle (The Penetrating, Wind) / Ground	58. Tui - The Joyous, Lake / Open
59. Huan - Dispersion [Dissolution] / Dispersing	60. Chieh - Limitation / Articulating
61. Chung Fu - Inner Truth / Centre Confirming	62. Hsiao Kuo - Preponderance of the Small / Small Exceeding
63. Chi Chi - After Completion / Already Fording	64. Wei Chi - Before Completion / Not-Yet Fording

APPENDIX B: GLOSSARY

Aleatoric music: A process in which some elements are left to chance and may vary due to factors that are not controlled directly by the composer. Compositional choices (timbre, pitch, dynamics, duration, tempo) may be aleatoric, for example determined by a random sequence of numbers or a preconceived pattern.

Ch'an (Zen): Buddhist philosophy as introduced in China by the monk Bodhidharma around the turn of the 6th century C.E. with a focus on meditation to achieve a state of perfect wisdom and enlightenment.

Chance operations: Methods of generating art independent of the artist's will.

Dao (the Way): A Chinese philosophy dating from the 6th century B.C.E., centered on realizing the way or path to self-understanding.

Hexagram: Patterns of six broken and unbroken lines.

I Ching (Zhou Yi or Yi Jing): A collection of ancient Chinese writings used for divination or to make predictions about the future.

Immutable: Unchanging.

Indeterminacy: Another name for various aleatoric processes in music.

Mobile: Change.

Musicircus: It is an invitation by Cage to bring together any number of groups of any kind, and letting them perform at the same time anything they wish.

Musique concrète: Concrete music.

Superposition: Number of layers in the music.

Tao Te Ching: The way of integrity.

Taoism: Ancient Chinese tradition of philosophy, religious and ethic. The specific revealer of Taoism was Lao Tzu (634-531 B.C.).

Trigram: Eight figures of three lines.

Yin/yang: The two great opposing and complementary forces at work in the world. Yin is female, cold, dark, passive, and soft. Yang is male, light, warm, active, and firm. Together they interact to make up the world.

Zen Buddhism: A practice that was uninterruptedly transmitted from master to disciple, and that goes back to the spiritual awakening (Satori in Japanese) of a man named Siddharta Gautama (Shakyamuni Gotama in Japanese) - The Buddha - 2500 years ago in India.

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