

THE SIGNIFICANCE OF PERCUSSION IN
CONTEMPORARY MUSIC BETWEEN 1945 AND 1970.

ILLUSTRATED IN
KARLHEINZ STOCKHAUSEN'S 'ZYKLUS'
LUCIANO BERIO'S 'CIRCLES'
MORTON FELDMAN'S 'THE KING OF DENMARK'
AND
IANNIS XENAKIS' 'PERSEPHASSA'.

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GENERAL INTRODUCTION

Percussion has been a characteristic feature of Western Music in the twentieth century, distinguishing developments in this century from music of the past. The use of percussion instruments had grown increasingly since 1900, such that in the music of the fifties and sixties their sounds had assumed an integral part of musical structure.

Ideas arose after 1945 which presented new possibilities of musical sound and organisation. These trends may be seen to be conducive to the introduction of percussion as a viable element in basic musical construction.

Predominating in Europe and America, the new ideas were characterised by the necessity of re-evaluating and re-defining traditional concepts. However, at the same time they may be considered as logical consequences in the development of Western musical thought. The broad term 'New Music' as used by Reginald Smith Brindle in his book of the same name^{*}, will be employed to represent these particular advances after the Second World War.

* R.S. Brindle: 'The New Music', O.U.P., London, 1975: Preface. (Although there is no formal definition of the term here, this and the use of the term in the entire book could be said to define 'New Music').

The years 1945 to 1970 have thus been marked by an emergence of new performance techniques and structural innovations. Chief among composers prominent in these developments were John Cage, Earl Brown, Christian Wolff and Morton Feldman in America, and Karlheinz Stockhausen, Luciano Berio, Mauricio Kagel, Pierre Boulez, Iannis Xenakis and Krzysztof Penderecki in Europe.

Each in his own way acknowledged the validity of creating musical forms which did not rely on pitch as the main structural feature. Consequently, other parameters such as duration, intensity and timbre were extended and exploited as constructional devices.

An examination of the fundamental role played by percussion in the evolution of New Music forms the major part of the present study.

Before this discussion however, Chapter One surveys developments between 1900 to 1945, concentrating on composers' growing concern for percussion instruments and percussive sound sources. This focus may be seen to stem from an increasing interest in timbre alongside new attitudes towards pitch and rhythmic structures. In this section other compositional streams are also considered, which, although peripheral to the mainstream of music at the time, nevertheless foreshadowed developments following the Second World War.

Chapter Two discusses trends between 1945 to 1970, revealing the particular relationship between the concepts of New Music and the materials of percussion.

Against this background, Chapter Three will concentrate on a detailed discussion and analysis of four percussion works, which present examples indicative not only of the diverse range of percussion scores composed in the period but also of the connection between new ideas and percussion.

Stockhausen's 'Zyklus' and Berio's 'Circles' are works of composers who are part of the 'European tradition'. Feldman's 'The King of Denmark' and Xenakis' 'Persephassa' are examined as examples of other concepts: indeterminacy, which arose in the U.S.A. in the first case, and the use of sound mass and mathematical procedures in the second. Each work is characteristic of the composer's style and also occurs as an important stage in his musical evolution.

These four works are discussed in connection with new approaches to notation, performance and structure in terms of the contribution to their respective composers' styles and New Music in general.

It will thus be the basic conclusion of this study that New Music and the development of percussion are intrinsically related.

CHAPTER ONE

INTRODUCTION

The various developments and undercurrents in music between 1900-1945 brought with them a growing concern for percussion. This increased in importance in the mainstream of musical thought towards the middle of the century. These musical developments reflected the change in the western environment and culture, expressing the mood of the new century in music. A machine age was developing, influenced by progress in industry and technology, with new inventions such as the motor car, aeroplane and industrial machines, bringing with them new sounds in the environment.

Composers responded in different ways to the social change. Some, for example, started out anew with reactions to the past, while others carried through ideas from preceeding developments. New approaches to music emerged, resulting in new attitudes to the basic materials of music. Percussion played a large part in these advances, such that the sound medium attained a new importance in music after 1945.

Before the outbreak of World War One, new musical concepts and structures were explored in the mainstream of musical thought by Debussy, Schoenberg and Stravinsky. These composers laid the foundations for future developments.

After the war, neoclassicism in music emerged in various forms, serialism was being established by Schoenberg and the Viennese School, and Paris remained a centre of activity in the introduction of new ideas. There was also Varèse, whose individual musical style was coming into fruition. Varèse later travelled to America, where he may have influenced the growing school of experimental composers on the U.S.A.'s west coast. At this time, the school included figures such as John Cage, Henry Cowell and Lou Harrison.

From these developments in the first half of the century came the seeds of the new music of the post-1945 generation where certain elements and ideas were to assume a new importance.

1890-1914

Around the turn of the century there were already reactions against late Romantic chromaticism. New approaches to tonality were being explored by Debussy, Schoenberg and Stravinsky. The extensions of the Romantic chromatic expressionism in Wagner's 'Tristan and Isolde' lead to the atonalism of Schoenberg in the first ten years of the century with its emancipation of dissonance. Stravinsky was developing a new orchestral sonority, culminating in 'The Rite of Spring' (1913) with its primitivism and new rhythmic emphasis, at times using the enlarged orchestra as a rich percussion instrument.

DEBUSSY:

Claude Debussy, in his 'Prelude to the Afternoon of a Faun' (1894), introduced new concepts of tonality, texture and rhythm not heard before. The emphasis in this work is laid on textural and harmonic colour, to evoke a particular atmosphere or mood. A vagueness in tonality and rhythm characterises the 'Prelude', which aims at a new type of musical experience.

Debussy's use of harmony evades strong tonal centres so that particular chords are exploited for their colouristic, sensual effects as they contribute to the mood of the piece, rather than obeying established practices of harmonic progression and structure. This is, in fact, a characteristic feature of Debussy's music: Donald J. Grout writes of Debussy's harmony:

'... chords are not used to shape a phrase by tension and release through a conventional series of progressions and resolutions; instead, each chord is conceived as a sonorous unit in a phrase whose structure is determined more by melodic shape or colour value than by the movement of the harmony.' (1)

Debussy's use of harmonic colour derived from his desire to express an impression of a particular environment; not programmatically, but mentally, so the essence of the mood is felt and experienced by the listener. In the music there was none of the Germanic emotionalism or drama, rather a concentration on the pure abstract quality of the sounds. Debussy thus made use of modes such as the pentatonic and whole tone scales to evoke certain impressions, illustrated in the 'Preludes for piano'. Once again these sound events were exploited for their colouristic effects. It may be seen that Debussy's concepts revealed a new approach to music in which sound and colour were the prime objects. Consequently he was to influence the whole of musical thought in the twentieth century through to the new ideas developed after 1945.

SCHOENBERG AND ATONALISM:

Arnold Schoenberg, on the other hand, developed in the line of the German late Romanticists, extending the tonal chromaticism and expressionism in works like 'Gurrelieder' (1900-1910), with its huge orchestral forces, and also in the 'Chamber Symphony No. 1' (1906). However, he found that the logical and inevitable progression following late Romantic chromatic harmony was atonalism, with its expressive dissonance and absence of a tonal centre. Here, all notes of the chromatic scale had equal importance.

An example is 'Pierrot Lunaire' (1912). The characteristics of this new musical approach are clearly presented in this work, and its contrapuntal style foreshadowed the type of music Schoenberg was to develop using serial procedures. Although 'Pierrot Lunaire's' expressionism and dramatic gestures linked it with late Romantics, its innovations looked to the future: the tense dissonant harmony within an atonal framework and the use of 'sprechstimme' (speech-song) represented elements of a musical style which were to become prominent in the latter half of the century.

Using all twelve notes of the chromatic scale on equal terms led to the examination of tension created between each melodic and harmonic interval. These intervals were considered in terms of relative dissonance to each other to create a musical flow. Thus, atonalism implied a re-thinking of musical structure such that each note of the chromatic scale had to be evaluated for its expressive effect in respect to every other note.

Through the exploration of the combinations of these notes, the seeds were laid for a new musical direction. Composers were forced to investigate the basic qualities of the relationships between the twelve notes, which represented a step towards the study of the nature of basic sound characters later in the century.

Even so, the twelve notes needed to be controlled according to a logical system. Serialism consequently gave the opportunity for composers to organise the intervallic qualities within a coherent concept in large scale works. However, this process was not developed till after World War One.

STRAVINSKY'S 'THE RITE OF SPRING':

Just as Schoenberg had discovered the need to examine a new harmonic language in his atonal music structures, Igor Stravinsky, in 'The Rite of Spring' (1913), investigated the possibility of rhythm as a unifying structural feature.

In this work, the exploitation of the orchestra as a means of articulating the rhythm resulted in a new orchestral sonority which emphasised percussive sound. This meant that pitch became a subservient element, and only important as far as it contributed to the rhythmic activity.

For example, in the section 'Dance of the Adolescents', the strings play a repeated polytonal chord (F flat major combined with the dominant seventh of A flat major), irregularly accented by the horns.

CHAPTER 1, FIGURE 1

THE AUGURS OF SPRING
DANCES OF THE YOUNG GIRLS
LES AUGURES PRINTANIERES
DANSES DES ADOLESCENTES

13 Tempo giusto 4 = 50

C. Ing.

Fag. 1 2

1 & 2 senza sord.

1.2 3.4

Cor. in Fa

5.6 7.8

13 Tempo giusto 4 = 50

arco (non div.)

sempre simile

VI. II

Tutti (non div.)

sempre stacc.

sempre simile

Vla.

arco (non div.)

sempre stacc.

sempre simile

Ve.

Tutti

arco (non div.)

sempre stacc.

sempre simile

Cb.

f

sempre stacc.

David Cope explains:

'The rhythm of the accents becomes the thrust of the work at this point and pitch becomes meaningless except in its being there.' (2)

The function of harmony here is of secondary importance to the structure of the accented rhythm. Because of the instruments' short, sharp attacks, the sound quality assumes a percussive character. However, this quality is further emphasised by the type of harmony used, which may be described as a cluster chord, or percussive harmony.

The orchestra is thus used as a huge percussion instrument, representative of the primitive atmosphere Stravinsky wanted to evoke. These features are especially exemplified in the 'Sacrificial Dance'. This section in fact reveals several characteristics typical of Stravinsky's musical style. For instance, it illustrates his approach to metre and rhythm, and also the revolutionary orchestration which was to influence the use of the orchestra in the twentieth century.

This section is almost totally constructed of cells - motivic units - which are repeated at various pitch levels and in various accented forms. There is no development in the traditional sense, but rather the rhythmic structure of the repetitions of these cells acts as a development, giving the music its impetus.

The percussive harmony is clearly evident, illustrated in Figure 1.2, as emphasis of the rhythmic motives.

The metre changes frequently, combined with a shifting of the accents on different beats of the bars.

CHAPTER 1, FIGURE 2

123

This musical score page contains measures 140 through 147. The instruments and parts are as follows:

- Ob.** (Oboe): Measures 140-147.
- C. ing.** (Clarinet in G): Measures 140-147.
- Cor. in Fa** (Cor Anglais): Measures 140-147.
- Tr. picc. in Re** (Trumpet piccolo in D): Measures 140-147.
- Tr. in Do** (Trumpet in C): Measures 140-147.
- Tr. bas. in Mi b** (Trumpet bass in B-flat): Measures 140-147.
- Trbn.** (Trumpet): Measures 140-147.
- Tbn.** (Trombone): Measures 140-147.
- Timp.** (Timpani): Measures 140-147.
- Vi I** (Violin I): Measures 140-147, with markings for *div.* and *unis.*.
- Vi II** (Violin II): Measures 140-147, with markings for *div. a 3* and *unis.*.
- Vle.** (Viola): Measures 140-147, with markings for *div. a 3* and *unis.*.
- Vc.** (Violoncello): Measures 140-147.
- Cb.** (Contrabasso): Measures 140-147.

Measure 140 is marked with a box containing the number 140. Measure 147 is marked with a box containing the number 147. The score includes various musical notations such as notes, rests, and dynamic markings.

Metric time is perceived in terms of the length of the smallest rhythmic unit, in this case the semiquaver. Consequently, the organisation of the bars relies on the groupings of the smallest time unit, and the rhythm is defined in terms of the metres of bars, rather than according to a constant time signature. 'The Rite' thus presented a new approach to rhythm which was a step towards the freedom of the bar line in later music.

Although many percussion instruments are used - five timpani, bass drum, cymbals, tam-tam, triangle, tambourine, antique cymbals and guiro - they still support the rhythmic activity of the orchestra and add colour and punctuation, rather than existing as a separate solo entity. More important is that the resulting orchestral sound achieved, as illustrated in Figure 1.2 is like that of a rich percussion instrument, with sharp attacks and quick decay characteristics.

Robert Houston observes:

'It is this work, perhaps more than any other Stravinsky composition that one associates with percussion. But in actuality, the reason for this belief is based on the fact that in 'Le Sacre du Printemps', Stravinsky utilised the entire orchestra as a percussion sonority. Percussion instruments provided rhythmic complexity and generated tremendous power while contributing exotic colour to the orchestration.' (3)

In fact, the chosen colours that Stravinsky used in 'The Rite' may be seen to be indivisible from the musical ideas. This relationship is characteristic of all Stravinsky's works. Grout wrote:

'A high proportion of Stravinsky's works is written for unusual groups of instruments... ... the particular colour is part of the particular musical conception in each instance.' (4)

Indeed, the concept of the unity between the material and idea holds true also for those works of Debussy and Schoenberg previously discussed. It applies in fact to the whole development of music in the twentieth century, becoming especially crucial in post World War Two music. The music of Debussy, Schoenberg and Stravinsky before the First World War, thus represented the major musical advances which affected traditional compositional attitudes. However, undercurrents also existed in musical thought that, although not having immediate impact and influence upon mainstream musical trends, foreshadowed future music developments.

FUTURISM:

The advances of science and technology heralded the new age of the machine. New sounds appeared in western society which directly stimulated certain artists and musicians of the day.

The 'Futurist' movement represented this response to the modern age. It arose in Italy, principally in the field of painting and literature, but also included explorations into the nature of new machine sounds and noises as vehicles for musical expression.

'Futurist music celebrated the new urban environment with its speed, noises and machines.' (5)

In 1910, Francesco Balilla Pratella published the 'Manifesto of Futurist Musicians'. Pratella denounced past music development and established traditions advocating a new music which would reflect the new world of the future. He wrote:

'Futurism, the rebellion of the life of intuition and feeling, quivering and impetuous spring, declares war on doctrines, individuals and works that repeat, prolong or exalt the past at the expense of the future'. (6)

Another Futurist, Luigi Russolo, published a manifesto in 1913, called 'The Art of Noises'. Russolo was more concerned with the practical application of the manifestos by creating compositions which made use of noises as musical material. He aimed at directly expressing the modern environment in musical terms. Paul Griffiths states:

'Russolo called for a music that would relate to the sounds and rhythms of machines and of factories'.(7)

However, Russolo did not wish to imitate the sounds of the new world to create programmatic works, but rather to use them as sonic events to compose abstract musical pieces.

He stated in his manifesto:

'Although it is characteristic of noise to recall brutally to real life, THE ART OF NOISE MUST NOT LIMIT ITSELF TO IMITATIVE REPRODUCTION'. (8)

He examined the nature of different noises, aiming at altering them so that they may be used as musical material, loosening the association as mere imitations of real sounds. To this end he invented his own musical instruments, or rather, sound producing devices he called 'intonarumori' (noise-intoners), which produced the noises he wished, to perform his music.

He lists six families of noises which exemplified the qualities that the Futurist composer would use.⁽⁹⁾

1	2	3	4	5	6
Rumbles	Whistles	Whispers	Screeches	Noises	Voices of
Roars	Hisses	Murmurs	Creaks	obtained	animals and
Explosions	Snorts	Mumbles	Rustles	by	men:
Crashes		Grumbles	Buzzes	percussion	Shouts
Splashes		Gurgles	Crackles	on metal,	Scream
Booms			Scrapes	wood, skin,	Groans
				stone,	Shrieks
				terracotta,	Howls
				etc..	Laughs
					Wheezes
					Sobs

These sounds in fact relate to the post-1945 sound world, in music such as that of Iannis Xenakis. The vocal sounds especially, present qualities that were to appear in post-1945 vocal music, illustrated in works such as Luciano Berio's 'Visage' (1961).

Percussion sounds also occupy an important place in the futurist sound world. The way this family of sound is classified and considered as a distinctive sound group may be seen to foreshadow the consideration and approach to percussion by composers in the 1950's and 1960's.

Although Russolo wanted to break with the past, he nevertheless acknowledged the developments of traditional musical concepts of Schoenberg and Stravinsky before the First War. He related his use of noise music to the dissonant harmonies that were being explored.

'Today, music, as it becomes continually more complicated, strives to amalgamate the most dissonant, strange and harsh sounds. In this way we come even closer to noise-sound'. (10)

However, although the leaders of new music styles were exposed to the Futurist's music, it did not exert influence on contemporary musical thought, as the Futurist composers failed to create significant and substantial works of art.

Even so, Futurist tendencies appeared in France in the 1920's, in music like George Antheil's 'Ballet Mécanique' (1924) and Arthur Honegger's 'Pacific 231' (1923). In these works it is worth noting that percussion was an important feature.

Ferruccio Busoni, in his writings, voices agreement of the Futurist's ideas. His 'Sketch for a New Aesthetic of Music' (1907, enlarged 1910), proposed possibilities of new musical scales and electronic music production. However, like Busoni's ideas, the Futurist musical manifestos and compositions were ahead of their time, remaining as philosophical exercises which would only become relevant much later in the century.

1918-1939: BETWEEN THE WARS

The Great War of 1914-18 had a considerable effect on social conditions and directly affected the development in the arts. There was economic instability and insecurity in the western world, especially in Europe.

Paris was the centre of activity of new trends in music, as well as the other arts, straight after the War.

Composers, searching for an expression of the times, extinguished any hint of Romantic expressionism even more than before. A new classicism was sought; a rational order and objectivity in music free from Romantic sentimentality. This music was thus categorised as the 'neo-classic' style.

There was a reaction against the big orchestral sound, so composers favoured smaller, chamber ensembles. However, they were perhaps influenced more by the economic situation after the war, and the availability of players.

Consequently, the neo-classic style drew influences from chamber music of the day - jazz and popular music - and past forms of the Baroque and Classical era. Stravinsky was a prominent figure in this climate, employing jazz-type chamber ensembles in works like 'Ragtime' (1918) and 'The Soldier's Tale' (1918). He avoided string instruments in works in the 1920's, the sonorities of which for him possessed Romantic associations. 'The Wedding' (1923) is an example, which also developed the percussive harmony, colour and rhythm of 'The Rite of Spring'.

STRAVINSKY: 'THE SOLDIER'S TALE':

'The Soldier's Tale', involving seven instrumentalists, exhibited influence of the instrumentation of popular music styles, exemplifying the neo-classic clarity of expression through the use of small mixed ensembles.

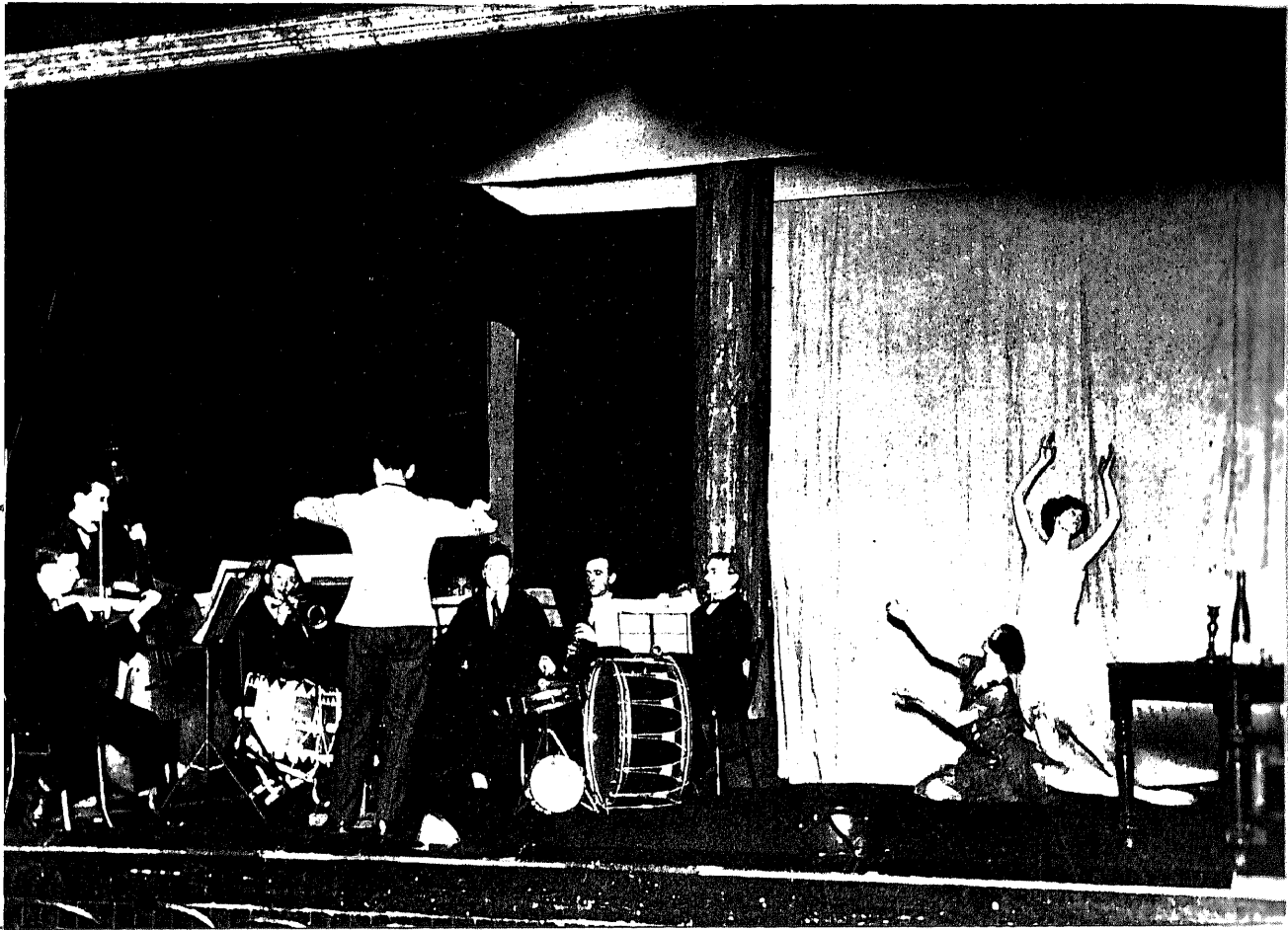
It is a theatre piece, where mime-dancers act out a story read by a narrator, with incidental music played between scenes and as accompaniment to the action. Stravinsky, however, also involved the musicians in the theatrical design by placing them on the stage, exploiting their gestures as a contribution to the visual effect of the play. Arthur Berger comments:

'The relation between gesture and tone is always a vital concern with Stravinsky...

... In productions of L'Histoire du Soldat and Les noces he prefers to place the instruments on the stage, since "the sight of the gesture and movement of different parts of the body that produce it (the music) are essential to seizing it in all its breadth". (11)

As Stravinsky featured musicians' gestures in 'The Soldier's Tale', so certain post-1945 composers exploited their movements in music theatre pieces and works for the concert hall. This is especially evident in percussion works such as Stockhausen's 'Zyklus' and Berio's 'Circles'. 'The Soldier's Tale' may therefore be seen as an ancestor of these works, focussing on the percussionist's actions by placing him in the centre of the instrumental ensemble. (Figure 1.3).

CHAPTER 1, FIGURE 3



The prominent percussion part, visually as well as musically, significantly affected attitudes of composers as to the possibilities of percussion at that time, and the new performance considerations.

Michael Rosen states:

'In 1918 Igor Stravinsky opened the eyes of composers to the soloistic capabilities of percussion with the composition 'L'Histoire du Soldat'. (12)

It presented one of the first uses of a multi-percussion set-up in serious music, with details for placement of the instruments and performance techniques. Stravinsky specifies how the instruments are to be placed in certain movements and the types of sticks to be used: different ones in each hand on occasion, and even the use of the cane handle of the fibre stick in the 'Tango'.

The 'Tango' is a typical example of the percussion writing in 'The Soldier's Tale'. (Figure 1.4).

CHAPTER 1, FIGURE 4

TANGO

M. M. $\text{♩} = 80$ (environ)

Clarinetto in La

Violino

Caisse claire sans timbre
grande taille *)

Grosse Caisse

une Cymbale fixée à la Gr. C.

1 tout l'archet

Le rideau se lève
Vorhang auf!
The curtain rises

2 Le soldat entre en scène
Der Soldat tritt auf
The soldier enters

The right hand has a stick with fibre head and the left has a leather-headed stick. Left hand strokes are specified by notes with stems up, while right hand strokes by stems down. The sound of the cane handle of the soft stick on the cymbal is indicated on a separate line, played by the right hand. This execution is related to the set-up of the instruments as specified by the composer.

Throughout the work, subtle percussion colours are exploited with the use of different qualities achieved by various sticks. Stravinsky also utilises the difference in sound produced between striking the bass drum in the centre and near the edge. (Figure 1.5).

CHAPTER 1, FIGURE 5

21

4

The musical score for Figure 5 consists of seven staves. The first staff is for Clarinet (Cl.) with a treble clef and a key signature of one sharp (F#). It begins with a measure marked with a box containing the number 4. The second staff is for Bassoon (Ry.) with a bass clef and a key signature of one sharp (F#). The third staff is for Cor Anglais and Piccolo (C. & P.) with a treble clef and a key signature of one sharp (F#). The fourth staff is for Trumpet (Trb.) with a treble clef and a key signature of one sharp (F#). The fifth staff is for Cornet and Grand Cymbal (C. & Gr. C.) with a treble clef and a key signature of one sharp (F#). The sixth staff is for Violin (VI.) with a treble clef and a key signature of one sharp (F#). The seventh staff is for Cello and Double Bass (C. B.) with a bass clef and a key signature of one sharp (F#). Various performance instructions are written below the staves, including 'sub. meno f', 'poco', 'arco', 'pizz.', 'bag. a tête en capoc', and 'au bord'.

He makes distinction between the long sound obtained at the edge and the short sound in the centre, punctuating the phrasing of the melody.

The execution of the percussion part has been worked out by Stravinsky himself and notated accordingly, so that his intentions are clear and performance indeed possible. James Blades says of Stravinsky's Percussion writing:

'What is rewarding to the player is that however challenging these situations may be. they all 'work out'. ... for it is known that Stravinsky made certain that his drum parts were practical by 'trying them out' himself'. (13)

The drum solo at the end of the 'Triumphal March of the Devil', which closes the work, shows how Stravinsky has worked out the performance of the figures on the four drums. It presents one of the earliest examples of a multi-percussion solo. The sticking for right and left hand is specified in the same way as the 'Tango'. (Figure 1.6(a)). However, today, this passage is usually transcribed into a more 'readable' notation for the percussionist, being compressed into one stave and without Stravinsky's method of indicating sticking. A possible transcription is illustrated in Figure 1.6(b).

CHAPTER 1, FIGURE 6

(a)

3dr. (16) (17) *Curtain falls*

B.D.

Tamb. et 2 C Cl.

(b)

3dr. (16) (17)

B.D.

Nevertheless, the way Stravinsky has approached the notation and performance of the percussion part forms a direct relation to writing for percussion after 1945, illustrated in Berio's conception of the percussion in 'Circles', and to a certain degree in Stockhausen's 'Zyklus'.

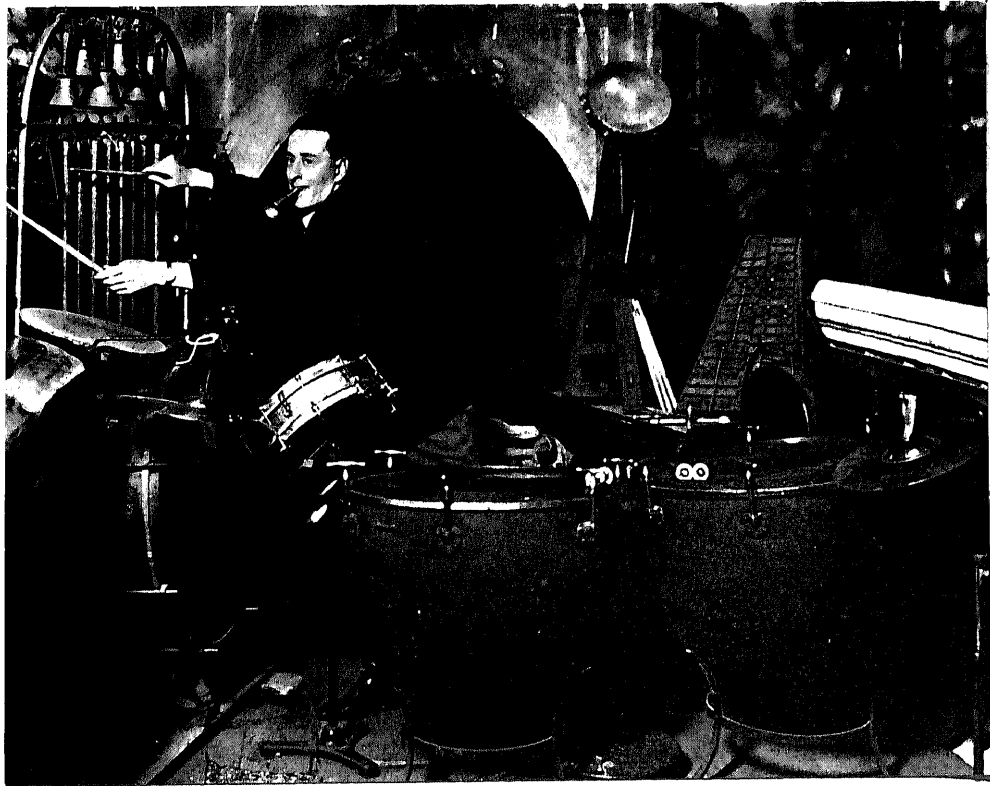
MULTI-PERCUSSION IN 1920's:

The influence of popular music's dance-band or 'trap' drummer is clearly evident in 'The Soldier's Tale', appearing also in William Walton's entertainment piece, 'Facade' (1923) and Darius Milhaud's 'Creation of the World' (1923).

The trap drummer existed in the dance-hall, travelling show, circus, and theatre pit. Similarly, Stravinsky's 'The Soldier's Tale' employed only a handful of performers, being conceived as a piece for a touring party as a travelling show. It was also a money making venture like popular music, in the difficult economic times after the war.

In theatre music of the 1920's, the kit or trap drummer was, in fact, a forerunner of the type of multi-percussion concepts which emerged in post-1945 music. (Figure 1.7).

CHAPTER 1, FIGURE 7



He used a variety of percussion instruments and effects according to the musical situation, including types of pitched and unpitched instruments. For instance, the photograph shows a glockenspiel and xylophone on the right, tubular and hand bells on the left, timpani, and different drums and cymbals. However, this represented only one type of set-up, just as post-1945 composers called for different percussion layouts for each work.

The dance-band drummer used a kit with the same sort of instruments each time: bass drum (with foot-pedal), cymbals, snare drum and tom-toms, with the possible addition of effects like wood blocks.

An excerpt from the 'Creation of the World' by Milhaud is shown in Figure 1.8, illustrating the use of percussion in the style of popular drum-kit technique of the time, supplying rhythmic support and colour.

James Blades' comments on trap drumming in the jazz ensemble, applies also to the percussion example from Milhaud's piece:

'The trap drummer was not only the metronome of the band: his purpose was to colour it with every sound possible from the instruments to his disposal, and to give the combination style'. (14)

CHAPTER 1, FIGURE 8

50

51

Fl

C

Cor

Trp

Tbn

Piano

B. mnd.

B. bn.

Cynth.

Cel.

G.C.

Trmb.

Vm.

Sax.

Vcl.

C.B.

metal block

wood bl.

Cym.

snare

cel.

GC

Trmb.

Vm.

Sax.

Vcl.

C.B.

M. E. 3402

M. E. 3402

PERCUSSION AND DANCE:

Previously, however, Milhaud made prominent use of a percussion ensemble in a soloistic manner in the ballet for small orchestra 'L'Homme et son Désir' (1918), (Man and his Desire). He employed unusual percussion colours, such as whip, whistle, wind machine and wood and metal castanets. These were used to evoke the mystic quality of the primeval Brazilian forest and the sounds of the creatures within the forest in polyrhythmic discourses.

It is worth noting that this work, like 'The Creation of the World', is a ballet. After the war, the preference for small ensembles and increased interest in percussion was, in fact, chiefly associated with music for dance and stage, illustrated in Stravinsky's 'Soldier's Tale' and 'The Wedding' (1923), and the two Milhaud works mentioned above. Ballet was thought of in new ways, what was to become 'modern dance', requiring new types of music. William Bolcom observes:

'The most interesting and still-played pieces that come from Paris in the teens and 20's seem to be ballets. Dance was becoming liberated from the sterile conventions of classical ballet and new music was needed for it'. (15)

The contribution of percussion was significant to the new music, accompanying the new ideas of ballet. In fact, in the following decade (1930's) in the U.S.A., the experimentations with new possibilities of percussion as the only musical material was linked with new concepts in modern dance. The percussion ensemble pieces of John Cage, Henry Cowell and Lou Harrison were derived from their associations with Merce Cunningham in the creation of music to accompany his new ideas of theatre and dance.

Just as these American composers' concert pieces for percussion could be said to stem from developments in the art of modern ballet, Milhaud also later in his career focussed on percussion solo in the concert hall, in terms of his neo-classic outlook. His interest in percussion, expressed in the ballets, thus led to the composition of the 'Concerto for Percussion Solo and Orchestra'. (1929).

However, although many different non-pitched percussion instruments are used in this work, the main thematic activity occurs in the orchestra. The solo, rather than being a vital part of the basic underlying structure seems to act as an elaboration and accompaniment of the pitched material.

Nevertheless, the possibility of such a work being conceived in Europe at this time was due to artistic climate in the 1920's. It was such that composers were able to experiment with new musical concepts and sound materials to express the atmosphere of the modern world.

The serialist school was growing in Vienna, with Schoenberg, Alban Berg and Anton Webern, and 'Les Six' were popular in Paris, of which Milhaud was a member.

Carl Nielsen was composing his Fifth and Sixth Symphonies (1921 and 1924, respectively), making use of percussion in a soloistic way in certain parts of the works. In the latter's second movement ('Humoreske') for example, the sparse texture and fragmentary musical figures feature a small percussion ensemble, consisting of triangle, glockenspiel and snare-drum in rhythmic dialogue. This movement perhaps symbolised the new attitudes to classical forms and the traditional symphony orchestra, illustrated in the increased importance of sonorities such as percussion.

Just as changes within established ensembles and traditional instrumentation were occurring in the 1920's, so extremes of new structures and sounds were being explored, completely divorced from traditional thought. In both cases, percussion occupied an important place.

ANTHEIL: 'BALLET MÉCANIQUE':

George Antheil's 'Ballet Mécanique' exemplifies the latter direction, relating to the Futurists in the 'delight of urban sounds'.⁽¹⁶⁾

It was first conceived in 1924-25 to accompany a film by the painter Fernand Leger but later became a concert work. Its instrumentation combined pianos with percussion, over the years being revised for various numbers of pianos, percussion instruments, and noise-making devices. Sounds such as electric doorbells, aeroplane propellers were included, later extended by buzz-saws, anvils, car horn, and, by the time of the final revision in 1953, a tape of jet engines replaced the aeroplane propeller.

These effects contribute to the atmosphere of the work, but the main melodic, thematic and rhythmic activity occurs in the piano parts and more conventional percussion instruments such as xylophone, timpani, bass drum, snare drum and cymbals. The aeroplane propeller and later the jet engine sound supply a background sound like a pedal point under the rhythmic activity, interspersed with unusual percussion and mechanical sounds.

Futurist tendencies are recreated here, but the musical construction that Antheil has devised offers new ideas of musical organisation based on rhythm ostinato and dynamic changes. The regular rhythmic ostinati and the machine sounds in a percussive texture clearly pays homage to the machine world, where the environment is dominated by the whirring sound of aeroplanes, the steady percussive noise of industrial factories at work, and other buzzing and clanking sounds. Consequently, the work's sensational visual and aural effects caused scandals which made Antheil infamous as a radical musical figure.

However, Antheil pointed out later that the 'Ballet Mécanique' was meant as a serious musical work which exploited the structuring of music derived from rhythmic repetition rather than tonal values. It was not meant solely as a programmatic musical parody or tribute to the machine.

Thomas Warner:

'According to his later statements, 'Ballet Mécanique' was never intended to glorify machines as commonly supposed, but instead to be a study in which 'time-space' principles replaced tonality as the basis for formal organisation'. (17)

In a letter to Nicholas Slonimsky in 1936, Antheil wrote:

'My personal opinion is that the 'Ballet Mécanique' is significant in one respect: I wrote it in a new form, a form which in particular fills up a gap on the canvas of time with musical abstractions and richly contrasting sound material, whereby I had time values in mind rather than tonal values'. (18)

The influence of Stravinsky is evident in the rhythmic ostinati within constantly changing time-signatures, and irregular placement of accents. Percussive cluster chords on the pianos are also present, reminiscent of the harmonies in 'The Rite of Spring'. Furthermore, combining percussion and piano sonorities in 'Ballet Mécanique' relates it to the instrumental ensemble Stravinsky employed in 'The Wedding'.

The contact between the pitched percussive sound of the piano and the pitched and non-pitched qualities in the percussion group created an instrumental ensemble sound characterised by hard sonorities and sharp attacks. This unified timbral quality, with a range from pitched to non-pitched sound, was suited to the enunciation of the rhythmic activity as well as allowing the possibility of tonal reference in the musical structure.

Later, this instrumental combination appeared in Bartok's 'Sonata for Two Piano's and Percussion' (1938) and the extension of these two mediums in the context of electronic music was featured in post-1950 developments in Stockhausen's 'Kontakte' (1959-60).

However, the significance of 'The Wedding' and 'Ballet Mécanique', in combining various percussion instruments, is that they presented the earliest examples of the percussion ensemble in western music. Through the increased use of percussion as the sole musical material, developed in Edgard Varèse's 'Ionisation' (1931), the percussion ensemble music of the 'West Coast School' in the U.S.A. in 1930's and 1940's, and Carlos Chavez's 'Toccata' (1942), the ancestors of music for percussion ensemble in the late 1950's and 1960's appear.

Blades comments:

'The percussion ensemble is no innovation if we consider the Asiatic gamelan, and the drum and xylophone ensembles of African and Latin-America. As we know it today, the percussion ensemble originated in all probability with compositions by Russolo, Antheil, and Varèse'. (19)

VARÈSE:

Even today, Edgard Varèse's 'Ionisation' for thirteen percussionists exists as one of the great works for percussion ensemble, and a masterpiece in twentieth century musical literature. Furthermore, it occupies an integral part of Varèse's musical development, rather than as a peripheral experimental exercise.

Conscious of his surroundings, Varèse expressed the feeling and sounds of the new world in the 1920's in works like 'Amériques' (1922), 'Arcana' (1925), 'Intégrales' (1926) and 'Hyperprism' (1923), all of which employ large percussion forces. The latter two works, in fact, utilise ensembles consisting only of wind and percussion, exploiting these instruments' sharp attack sound characters, in textures typical of the opposition to Romantic values.

When Varèse moved to New York during World War One, he experienced a musical environment in which he could express himself, away from the pressure of European musical tradition. Varèse wanted to compose music which would reflect the mood of his time with the sounds and noises of the big city.

Just as noise was part of the environment, so he felt it should be introduced as musical material, alongside the search for new sounds and instrumental colours. However, the new sound phenomena had to be integrated into logical musical structures rather than as mere effects. These sounds thus contributed to the character of Varèse's personal style. Fernand Ouellette comments:

'Varèse did not at any time wish to use noises or new instruments except within a creative and expressive process originating in his inner musical universe'. (20)

By focussing on the necessity of regarding any sound as musical material - what Varèse called 'the liberation of sound' (21) - Varèse predicted the musical attitudes of the 1950's and 1960's. He said later in 1959:

'My aim has always been the liberation of sound - to throw open the whole world of sound to music'. (22)

By concentrating on the expressive quality of any sound, Varèse exhibited the influence of Debussy's concepts of floating harmonies and emphasis on colour. Moreover, Varèse was encouraged by Busoni, who proposed the idea of electronic sound production derived from the necessity of freeing music from its tempered tonal structure.

Varèse thus considered music in terms of sound organisation rather than traditional concepts according to conventional harmonies and melodies. In the 1920's he in fact called his music 'organised sound' ⁽²³⁾ and regarded himself as 'a worker in rhythms, frequencies and intensities' ⁽²⁴⁾.

The conventional colours of the traditional orchestra could not express Varèse's new musical ideas adequately. He thus explored new instrumental possibilities and combinations, and especially concentrated on the musical potential of percussion instruments. Ouellette:

'To decide in favour of percussion, until such times as new instruments arrived, was to take up a position on the side of, the life, the beauty, and the richness of sound'. ⁽²⁵⁾

Chou Wen-Chung writes:

'In his use of percussion instruments, he added to the composer's resources a profuse variety of new timbres and modes of articulation and termination. He elevated the percussion instruments to a truly independent position'. ⁽²⁶⁾

Varèse's use of percussion as an expressive sound medium reached a peak in 'Ionisation'. The musical reflection of the new world, without references to structures and sounds of the past, is here given its fullest expression. It is significant in the development of western music in that it exhibits a unique logical structure based on non-pitched percussion sounds. Its form is derived from the materials used according to rhythmic development and contrasts between various percussion timbres and textures. Robert Craft explains:

'Each section of Ionisation is identified by its own combination of instruments, or range of sonority, and each important change in the substance of the sonority is also a demarcation in the form, the first entrance of the anvils... slightly more than half-way through the piece, and the entrance of the piano and chimes, near the end, are the most striking changes of this sort'. (27)

In essence, 'Ionisation' is therefore a timbre piece based on the composer's perception of the sound material. Although it is dominated by metric rhythms, it looks to the new music after 1945 where the types of materials give rise to the form and are inseparable from the structure.

The work exhibits no influence of the past, other cultures, or programmatic associations in its organisation of the percussion colours.

Except for the piano, glockenspiel and chimes, all instruments are of indefinite pitch. However, the pitched instruments are introduced only near the end in static chordal clusters, adding a haze of sound with a new timbral quality. This acts as a pedal-point, which demarcates the coda of the piece. (Figure 1.9).

Many types of skin, wood and metal instruments are used; various drums, cymbals, wood blocks, anvils, gongs and tam-tams, as well as high and low sirens, and Latin-American instruments like maracas, bongos, claves, guiro and a lion's roar (string drum).

CHAPTER 1, FIGURE 9

p. 26 of score.

$\text{♩} = 52$

13

1. Tam-tam clair
(Grosse Caisse / très grave)

2. Gong
Tam-tam grave

3. 2 Bongos clair
grave
Caisse Roulante
2 Grosse Caisse moyenne
grave

4. Tambour militaire
Caisse roulante

5. Sirène claire
Tambour à corde

6. Sirène grave
Percut
Güiro

7. 3 Blocs Chinois clair
moyen
grave
Claves
Triangle

8. Caisse claire
2 Maracas (Clair)
(Grave)

9. Tarole
Caisse claire
Cymbale suspendue

10. Cloches

11. Glockenspiel à clavier
(with reverb)

12. Grand Tam-tam
très profond

13. Piano

Pédale
joué à la fin

attique acide percuter. Laissez vibrer durée indiquée

3^{me} basse

to the end as rhythmically indicated

Varèse specified particular types and sizes of the percussion instruments to be used, and in some cases the playing technique. For instance, directions for the gong and tam-tam player:

'A mallet in each hand; use very elastic strokes; even in the *ff*, the combined weight of arm and mallet are sufficient; do not kill the tone'. (28)

and the cencerro:

'A cow bell with handle and no clapper: it is struck with drum stick and muffled by inserting a piece of soft material in the bell'. (29)

This was in fact indicative of his concern for the quality of sound required for the different colours and rhythms through the piece.

There are few instruments which are normally associated with the traditional percussion section of the nineteenth century symphony orchestra, typifying Varèse' interest in new sounds 'to give an account of the new civilisation then being born'. (30)

Similarly, adventures into new percussion sound sources became characteristic of new music trends on the west coast of U.S.A. in the 1930's. The 'West Coast School', led by John Cage and Henry Cowell, explored the new possibilities of musical sound organisation inferred by Varèse, creating many works for percussion ensemble.

PERCUSSION ENSEMBLE IN U.S.A.: WEST COAST SCHOOL:

-COWELL:

Henry Cowell's piece 'Ostinato Pianissimo' (1934), as the title implies, is made up of continuous rhythmic patterns at a low dynamic level. These patterns overlap and include irregular accents during their repetition as the work progresses. The influence of eastern music is thus exhibited in the use of ostinato with irregular, odd numbered accents and groupings within a static dynamic range.

Moreover, the types of percussion instruments employed in such a framework reinforces the influence of the east, with their resemblance to Indonesian gamelan sonorities. This is especially evident in the use of two string pianos (altering the sound by dampening the strings by hand), 8 rice bowls, 3 gongs, and xylophone. The ensemble is completed by 2 wood blocks, guiro, tambourine, 2 bongos and 3 drums.

In actual fact, the non-Western influence was important to all the composers in this school, derived from their rejection of Western traditional values. They accepted any sound phenomenon not usually associated with established musical trends in Western society to create a new musical idiom.

Cowell's outlook was indicative of the composers on the West Coast: Griffiths writes:

'For him, music was an open field where any resource, any experiment, any tradition (including, most definitely, exotic and ethnic traditions) might prove of value'. (31)

His new ideas concerning sound materials and composition were brought together in the book 'New Musical Resources' (1930). As early as 1912 he was experimenting with the sonorities of the piano. In 'The Tides of Manaunaun' (1912) he makes use of dense clusters played with the palm, fist or forearm, which assume noise-like character. The string piano in 'Ostinato Pianissimo' was a development of the way Cowell used the piano in works like 'Aeolian Harp' and 'The Banshee' (1925) which explore the inside of the piano: plucking, brushing or beating the piano strings.

-CAGE:

John Cage later developed the possibilities of new ways of using the piano in works like 'The Wonderful Widow of Eighteen Springs' (1942) and 'Sonatas and Interludes for Prepared Piano (1946-8), the sounds of which are conceived in terms of percussion rather than piano works.

The former work uses a closed piano and the player is required to strike different parts of it with his fingers and knuckles. The latter set of pieces require the strings to be 'prepared' by inserting various bolts, screws and rubber between the strings at specific locations. Like Cowell's 'Ostinato Pianissimo', the Cage work is reminiscent of the sound world of the Indonesian gamelan, and, as the gamelan orchestra is made up of various colours and players, so the prepared piano is:

'a percussion ensemble under the control of a single player'. (32)

Extending the possibilities of piano into the realm of noise-like sounds, illustrated in the Cowell and Cage works, indicate the pre-occupation with percussion sonorities as musical material. Cage, especially, pioneered music for percussion alone, organising concerts of his own percussion music, as well as music by others.

His music made use of any sounds which could be produced by striking: orchestral percussion instruments, oriental, cuban and jazz percussion, and even objects with non-musical associations such as car parts, iron pipes, metal sheets, tin cans and rice bowls. Also included are objects like whistles, and others scraped and rubbed. These sounds were abstracted from their normal environments to be used as sound sources for a new music.

In actual fact, Cage's percussion explorations derived from his philosophies concerning music in general, where any sound, including noise, may be regarded as a musical source, explained in his article 'The Future of Music: Credo' (1937).⁽³³⁾

In the Credo, Cage advocated several new ideas:

1. the use of noise

'Wherever we are, what we hear is mostly noise... The sound of a truck... Rain. We want to capture and control these sounds, to use them not as sound effects but as musical instruments'. (34)

2. music with the aid of electrical instruments

'... which will make available for musical purposes any and all sounds that can be heard'. (35)

and also precision:

'... to provide complete control of the overtone structure of tones (as opposed to noises) and to make these tones available in any frequency, amplitude, and duration'. (36)

3. new approaches to time and rhythm
derived from electrical instruments

'The composer (organiser of sound) will be faced not only with the entire field of sound but also, with the entire field of time. The 'frame' or fraction of a second, following established film technique, will probably be the basic unit in the measurement of time. No rhythm will be beyond the composer's reach'. (37)

4. percussion music

'... is a contemporary transition from keyboard-influenced music to the all-sound music of the future. Any sound is acceptable to the composer of percussion music... Methods of writing percussion music have as their goal the rhythmic structure of a composition'. (38)

These ideas, conceived in 1937, were in fact prophecies of the direction of music after 1945, in the consideration of noise, electronic music and percussion.

Cage's 'First Construction in Metal' (1939) exemplified his approach to the problem of organising percussion sounds in terms of rhythmic structure. This rhythmic structure was based on the 'duration, not of notes, but of spaces of time'. (39)

It stemmed from Cage's examination into the relation between sound and silence:

'Sounds, including noises, it seemed to me, had four characteristics (pitch, loudness, timbre and duration) while silence had only one (duration)'. (40)

The silence between sounds, explored in his percussion music, was to become an important study of Cage later in the 1950's, where he investigated the nature of silence itself.

The 'First Construction in Metal' is based on a structure of numbers of bars of 4/4 in a sequence of 4-3-2-3-4 (16 bar group) which are repeated 16 times in the whole work, with a coda of 9 bars added (2-3-4).

These divisions signify changes or additions in instrumentation and rhythmic pattern within the bars through the work. For instance, the 'exposition', presenting all the sound material, is made up of 4 x 16 bars of 4 x (4+3+2+4+4) with different sound events and rhythms occurring in each of 16 bar sequences 4, 3, 2, 3, 4. (Figure 1.10).

The 'development' occupies the rest of the work, changes occurring according to the sequence 3, 2, 3, 4, group of 4-3-2-4 bars, i.e. 3 x (4+3+2+3+4) and 2 x (4+3+2+3+4) and 3 x (etc.). Cage points out the influence of Indian Tala (rhythmic method) in this concept, but having the Western idea of beginning, development and end.

Unusual metal sonorities predominate, in keeping with the search for new sounds, including Cage's own invention, the water gong - a suspended gong lowered into a tub of water while struck lowers the pitch, and lifted out, raises the pitch.

CHAPTER 1, FIGURE 10

FIRST CONSTRUCTION (IN METAL)

PERCUSSION SEXTET WITH ASSISTANT

JOHN CAGE

1. 96 (MODERATELY FAST)

THUNDERBOLT

2. STAINED PIANO WITH ASSISTANT

3. OXEN BELLS

4. THUNDERBOLT

5. THUNDERBOLT

6. THUNDERBOLT

7. OXEN BELLS

8. THUNDERBOLT

9. THUNDERBOLT

10. THUNDERBOLT

11. OXEN BELLS

12. THUNDERBOLT

13. OXEN BELLS

14. THUNDERBOLT

15. OXEN BELLS

16. THUNDERBOLT

17. OXEN BELLS

18. THUNDERBOLT

19. OXEN BELLS

20. THUNDERBOLT

21. OXEN BELLS

22. THUNDERBOLT

23. OXEN BELLS

24. THUNDERBOLT

25. OXEN BELLS

26. THUNDERBOLT

27. OXEN BELLS

28. THUNDERBOLT

29. OXEN BELLS

30. THUNDERBOLT

31. OXEN BELLS

32. THUNDERBOLT

33. OXEN BELLS

34. THUNDERBOLT

35. OXEN BELLS

36. THUNDERBOLT

37. OXEN BELLS

38. THUNDERBOLT

39. OXEN BELLS

40. THUNDERBOLT

41. OXEN BELLS

42. THUNDERBOLT

43. OXEN BELLS

44. THUNDERBOLT

45. OXEN BELLS

46. THUNDERBOLT

47. OXEN BELLS

48. THUNDERBOLT

49. OXEN BELLS

50. THUNDERBOLT

51. OXEN BELLS

52. THUNDERBOLT

53. OXEN BELLS

54. THUNDERBOLT

55. OXEN BELLS

56. THUNDERBOLT

57. OXEN BELLS

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86. THUNDERBOLT

87. OXEN BELLS

88. THUNDERBOLT

89. OXEN BELLS

90. THUNDERBOLT

91. OXEN BELLS

92. THUNDERBOLT

93. OXEN BELLS

94. THUNDERBOLT

95. OXEN BELLS

96. THUNDERBOLT

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The eastern influence is also felt in Cage's 'Quartet for Twelve Tom-Toms' (1943), a work solely for skin instruments, just as 'The First Construction' was only for metal percussion. An eastern hypnotic effect is created in the 'Quartet', by the use of fingers playing in the centre and edge like an Indian tabla player, resulting in a soft muted sound.

-CHAVEZ: 'TOCCATA':

Another piece, using mainly skin instruments, composed around the same time offers a musical sound quite opposite to Cage's 'Quartet'. The 'Toccata' of Carlos Chavez (1942) employs percussion instruments used in the traditional orchestra, played in a traditional manner. However, instruments of Latin American origin are also included.

It is a bravura piece for percussion based on rhythmic development of material in a more traditional way than Cage. Chavez writes:

'The thematic material is, for obvious reasons, rhythmic rather than melodic. However, themes proper, integrated by rhythmic motifs, are developed as I would have done with melodic elements'. (41)

In this sense, the Chavez work is more related to traditional music and forms than Cage's work.

However, Chavez, like Cage, still maintains an underlying unity within each movement according to the timbral families of percussion. For instance, the first movement is only for skin instruments. The second is scored for resonant metallic instruments, including pitched instruments such as the glockenspiel, and also the xylophone. Drums predominate again in the final movement, but the glockenspiel is integrated, symbolising contact between melodic and rhythmic elements and skin and metallic colours.

Latin-American instruments used consist of claves and maracas, their use derived from their original function in the performance of ostinato rhythms. In fact, the whole work, although conceived in a traditional western classical form, with exposition-development-recapitulation, and fast-slow-fast arrangement of movements, exhibits marked influence of Latin-American percussion ensemble music. Although in stylised form, this is revealed in Figure 1.11, with the ostinati and rhythmic repetitions across the bar-line.

CHAPTER 1, FIGURE 11

18

small drum
three drums
side drum
claves
timpani
bass drum

mp

mf

44

f

claves

f

f

45

f sempre

f sempre

(con D. S. on)

f

46

DEVELOPMENTS IN TRADITIONAL FORMS

In the developments in the U.S.A. and Europe, the discussion has centred around *avant-garde* trends between 1900-1945. It has concentrated on events apart from the mainstream of traditional music.

However, even the European advances based on traditional formal themes and materials included an increased interest in percussion, as Nielsen's 'Sixth Symphony' (1924-5) discussed earlier, illustrated. Hindemith's 'Symphonic Metamorphoses on Themes of Weber' (1943) for orchestra, is another example.

PAUL HINDEMITH:

The neo-classic outlook of Hindemith is revealed in this work. Even so, despite its ties with nineteenth century orchestration, the work also includes solos for percussion ensemble in the second movement ('Turandot Scherzo'). The movement closes with a rhythmic discourse for percussion, the timpani and tubular bells in melodic counterpoint, with accompaniment on conventional percussion instruments: triangle, tom-tom, wood block, small suspended cymbal, small gong. (Figure 1.12).

CHAPTER 1, FIGURE 12

PK. TIMPANI
Glocken (rubular bells) (Glocken)
Trompeten (Trombones)
Hörnchen (wood block)
Al. (Allegro)
poco a poco dim
poco a poco dim
poco a poco dim
poco a poco dim
(Gong)
mf dim
mf dim
mf dim
p dim
p dim
p dim
p dim

Schl.

PK.

Schl.

BARTÓK:

A more significant figure in terms of percussion is Béla Bartók, whose music contributed much to the elevation of the medium as an important voice in the European traditional musical mainstream. He consistently exploited percussion in a soloistic manner in a musical style that was influenced by 'Bach's texture of contrapuntal fullness, Beethoven's art of thematic development, and Debussy's discovery of the sonorous (as distinct from functional) value of chords'. (42)

Bartók thus developed classical models, like the sonata, concerto and string quartet and methods of procedure like sonata-form and fugue.

His work in the 1920's and 1930's in these forms were distinguished by percussive motoric rhythm and free expressive use of dissonance. Cluster chords, reminiscent of Stravinsky's 'The Rite of Spring', colouristic effects influenced by Debussy, and modal melodies and perpetual rhythms derived from Hungarian folk idioms, lean towards a percussive quality which characterised Bartók's music in these decades.

Percussion could therefore be said to be an inherent element in his musical style. Consequently it was inevitable that he should write works such as 'Music for Strings, Percussion and Celesta' (1936) and the 'Sonata for Two Pianos and Percussion' (1937).

Contacts between strings and percussion are exhibited in the former work in various ways. For example, in the third movement the timpani glissandi (with and without rolls) may be seen to match the violins' two-note melodic figures. (Figure 1.13). Elsewhere, in parts of the fast movements, the strings' short, sharp attacks seem to assume percussive character. An example is the opening of the fourth movement, where the strings are strummed vigourously. (Figure 1.14).

CHAPTER 1, FIGURE 13

III.

Adagio, ♩ ca 66 A

Timpani allarg.

Xylophon rubato

5 B al Adagio molto, ♩ ca 40

Timpani dim. pp

Xylophon

1. Vcl. A B A B

1. Vcl. pp

1. Cb. pp

10

Timpani mf p pp

Xylophon mf

2. Vcl. p

1. Vcl.

1. Vcl.

1. Cb.

CHAPTER 1, FIGURE 14

IV.

Allegro molto, ♩ ca 120

Timpani (Timp.)

1. Violin I (1. VI.)

2. Violin I (2. VI.)

1. Violin II (1. VI.)

2. Violin II (2. VI.)

1. Viola (1. Vlc.)

2. Viola (2. Vlc.)

1. Violoncello (1. Cb.)

2. Violoncello (2. Cb.)

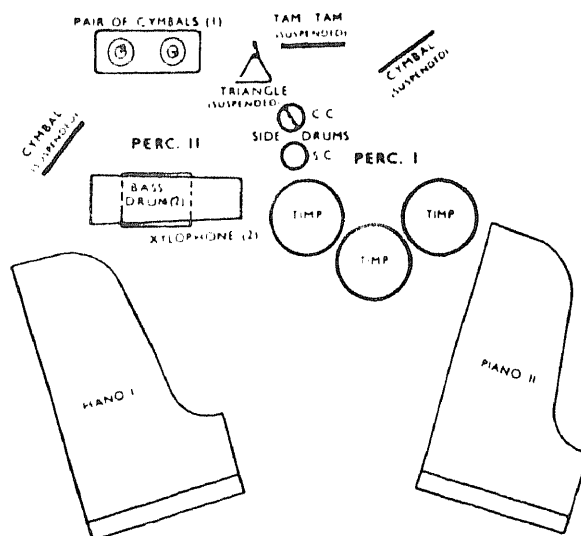
Dynamic markings: *f*, *pizz.*, *cresc.*, *ff*, *sim.*

Time signature: 2/2

Bartók's percussion specifications are meticulous, derived from an understanding of the performance techniques and interest in extending the range of sound. He employs standard orchestral percussion, such as xylophone, snare drum, cymbals and timpani, and, rather than introducing new exotic instruments, Bartók achieves novel effects through new ways of playing conventional ones.

The 'Sonata for Two Pianos and Percussion' exemplifies his approach to percussion. In the score, Bartók supplies a stage layout of the percussion in relation to the pianos, so changes between instruments are not only physically possible, but each performer maintains eye contact. (Figure 1.15).

CHAPTER 1, FIGURE 15



- (1) The pair of Cymbals should be laid on cloth, when not in use, to prevent vibration.
- (2) The Xylophone should be placed above or next to the Bass Drum.

The percussion parts are of equal importance to the two piano parts, adding colour to the piano sonorities, emphasising rhythmic activity, and supplying contrapuntal lines. Pitched instruments like timpani and xylophone are also involved in melodic, thematic development.

Figures 1.16 and 1.17 illustrate the extension of percussion colours and the ways percussion has been combined with the pianos. In Figure 1.16, Bartók exploits the sounds obtained by hitting a drum in the centre and near the edge, and the various qualities achieved with different sticks.

The use of percussion in thematic discourse is shown in Figure 1.17. Here, the quintuplet figure of the piano is echoed by the timpani and xylophone. However, it also appears in the two snare drums (one with snares and the other without) which represents an imitation of the theme using non-pitched sounds.

CHAPTER 1, FIGURE 16

II

Lento, ma non troppo, $\text{♩} = ca. 60$

with a thin wooden stick.....

Percussion I Cymbal $\frac{4}{4}$ $\frac{8}{2}$ pp on the extreme edge..... on the dome

Side Drum s.c. $\frac{4}{4}$ ppp $\frac{8}{2}$ p $\frac{4}{4}$ $ppp < p$ $\frac{8}{2}$ $\frac{4}{4}$

Percussion II Side Drum s.c. $\frac{4}{4}$ ppp $\frac{8}{2}$ p $\frac{4}{4}$ $ppp < p$ $\frac{8}{2}$ $\frac{4}{4}$

♩ means: in the centre. ♪ means: on the extreme edge of the skin.

5

P. I $p, dolce$

Perc. I on the edge $\frac{4}{4}$ $\frac{8}{2}$ with soft headed stick $\frac{4}{4}$ wooden stick (extreme edge) $\frac{8}{2}$ soft headed stick $\frac{4}{4}$

S.D.c.c. $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$

Perc. II S.D.s.c. $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$

9

P. I

P. II $p, dolce$

Perc. I Cym. $\frac{4}{4}$ $\frac{8}{2}$ ppp wooden stick (extreme edge) soft headed stick

S.D.c.c. $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$

Perc. II S.D.s.c. $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$ $\frac{8}{2}$ $\frac{4}{4}$

B. A. V.

CHAPTER 1, FIGURE 17

[illegible]

The 'Sonata' thus illustrates Bartók's detailed study of new percussion techniques, as well as the integration of pitched and non-pitched percussion material within a tonal framework.

However, although he explored new possibilities of sound with percussion, his musical outlook nevertheless remained associated with the tonal music of the past in the organisation of material.

SERIALISM:

On the other hand, the serialists, Schoenberg, Berg and Webern, who worked at the same time as Bartók, composed music without reference to traditional tonality. These composers sought to develop a new method of organisation based on the ordering of all twelve notes of the chromatic scale.

Deriving serial structure from atonal developments before World War One, they rejected traditional tonal values of consonance and key centre, and based their language on dissonance, where all twelve notes are of equal importance. The basis of a piece was thus the serial row: a combination of intervals between each of the twelve notes decided upon by the composer. This row exhibited certain intervallic characteristics which the composer exploited in a particular work.

Just as tonal music had rules or conventions of harmonic and melodic progression, so the serialists formed their own methods of procedure in harmony and pitch relations which negated tonal practices.

Rejecting tonal values meant a rejection of forms derived from them, like sonata-form. Even so, links with the past were maintained with the use of classical musical characters such as the suite, concerto, string quartet. However, these were treated only in a broad sense, for their works, which were basically contrapuntal, involved continuous variation without repetition of material, derived from manipulations of the serial row.

Twelve-tone serialism appeared as a new classicism in music which developed from the past, but represented a different direction from the neo-classic style. Both, however, displayed a common denominator in seeking to create a rational and objective order in twentieth century music.

WEBERN:

Anton Webern's music and his use of serial procedures, more than Schoenberg and Berg, was to influence the progress of music after World War Two as a model and starting point for the new generation of composers.

Although Webern did not employ percussion as prominently as other major figures of his time, he nevertheless may be seen to contribute to the significance of percussion in the music after 1945 in the way he used his sound materials.

He saw the importance of silence as a structural element equal to the sounds. Sparse textures thus characterised Webern's music throughout his development. The many 'rests' served to isolate small figures or single notes, giving each sound a foreground importance without any secondary or accompanying material. Every sound and utterance is given its full expressive quality, emphasised by the space between the notes. This is illustrated in the fourth piece from the 'Five Orchestral Pieces'. Op. 10 (1913). (Figure 1.18).

CHAPTER 1, FIGURE 18

IV.

Fließend, äußerst zart (♩ = ca 60)
rit. - - - tempo rit. - - - tempo

Kl. in B
ppp

Trp. in B
m. Dpf.
dolce
pp
dolcissimo
pp
sehr gebunden

Pos.
m. Dpf.
pp

Mand.
dolce
Zeit lassen
pp
pp

Col.
ppp
pp

Hrf.
pp
pp

Kl. Tr.
ppp

Fließend, äußerst zart (♩ = ca 60)
rit. - - - tempo rit. - - - tempo

Solo - Og.
m. Dpf.
wie ein Hauch
ppp

Solo - Br.
m. Dpf.
pp

Cage's approach to sound and silence in the 1950's was influenced by Webern in this regard, allowing each sound to be given opportunity to be heard in its own time. Each sound was separated by silence, but Cage focussed on the nature of silence itself so that the gaps between the sounds could be said to be more important than the sounds themselves.

The structural importance of silence becomes more pronounced in Webern's serial works, such as the 'Symphony' Op. 21 (1928). (Figure 1.19).

i

ANTON WEBERN, OP. 21

ՀԱՅԱՍՏԱՆԻ ԽՈՐ ՔԱԼԻՄԻՐ

[illegible]

In die „Philharmonia“-Partiturenensammlung aufgenommen

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Sparse textures derive from the concentration of thought in these works, where the timbre, intensity, duration, pitch and articulation of each sound become crucial to the structure.

The excerpts from the 'Symphony' and the 'Five Orchestral Pieces' show how each sound takes on an almost percussive character in the precise attack and isolation within the texture. For example, in Figure 1.19, each note is expressed by a tenuto mark, or pizzicato articulation where string instruments are concerned. The notes' presence and characteristics are hardly felt in their brief appearance. However, it is precisely this quality of each sound almost straining to be heard over the silence that account for the economic expressivity in Webern's music.

Morton Feldman's sound world, illustrated in 'The King of Denmark', takes this type of texture into the realm of indeterminacy of the late 1950's and 1960's, where every sound is an independent musical event to be understood only for itself without relation to others.

On the other hand, Webern's structuring of every note according to a tightly-knit system of serial relationships, gave rise to total serial procedures after the Second World War. Here, each parameter of sound was serialised. Each sound thus had distinct characteristics which isolated it within the texture, but was accounted for according to a rigorous scheme.

Although these developments of Webern's music represented opposing philosophies, in both cases pitch importance was reduced and other characteristics of sound became more prominent, allowing the possibility for any sound to be conceived as musical material.

Just as Webern's music may be seen to possess the character of percussion in the use of sound and silence, his influence on the shape of New Music could be said to have resulted in a texture which permitted the introduction of percussion elements.

Indeed, it may be seen that all the various threads and lines of thought discussed in this chapter contributed to musical development in the 1950's and 1960's. A common feature in the trends between 1900 and 1945 was the interest in colour and the examination of the basic materials of music to reflect the modern world of the twentieth century.

Foremost in these advances may be seen to be the increased use of percussion instruments, not only as a source of new colours, but also as a means of exploring new structural possibilities. The percussion ensemble works of Varèse, Cage, Chavez and Antheil exist as evidence, but sections of Stravinsky's 'Soldiers' Tale', Hindemith's 'Symphonic Metamorphoses' and Nielsen's 'Sixth Symphony' are also significant.

Even so, sound phenomena such as cluster chords, dissonant harmony, noise as musical sound, extensions of sounds on traditional instruments away from pitch (i.e. snap pizzicato), and sparse textures (i.e. Webern), make percussive sounds in general an important feature of trends in the first half of the century.

CHAPTER TWO

1945 - 1970

INTRODUCTION

In serious western art music after World War Two there was a need to break away from traditional values to express the new social and artistic atmosphere of the atomic age. In the 1950's there arose a generation of composers, such as Boulez, Stockhausen and Berio in Europe, and Cage in the U.S.A., who extended the range of musical thought in efforts to create a musical language that would be representative of the post-1945 Western civilization. Brindle comments on the break from tradition:

'The intellectual climate of the atomic age demanded to be expressed through sounds completely different in nature. And these new sounds were characterised by the omission of traditional elements.

...the new sound of the fifties aimed towards mellifluous melodies (however brief), no coherent harmonies and clear-cut forms'. (1)

New approaches to musical structure in the early fifties thus aimed at re-evaluating the fundamentals of musical organisation. Brindle again:

'Every element of musical language had to be subjected to reappraisal and examination before it could be made part of the new art, which aimed at eradicating any suggestion of past musical languages'. (2)

Actually, the move away from tradition was more dramatic than what Brindle observes, in that throughout the first half of the twentieth century composers were already grappling with new ideas of melody, dissonant, percussive harmonies (Varèse, Cowell, Bartók) and new formal concepts (Webern, Cage) away from traditional ideas. Consequently, in the 1950's, the re-examination was not so much subjected to melody, harmony and rhythm, but rather was directed at the very materials of music, of the nature of sound. Formal principles emerged that ranged from the complete structural freedom of Cage's concepts, to the absolute precision achieved by the electronic music composers in Cologne.

The electronic medium threw new light on the grammar of music such that concern for melody, harmony, rhythm were replaced by terms such as frequency (pitch), density, duration, in addition to the realisation of the structural importance of attack, intensity and timbre. These scientific terms were necessary to describe precise characteristics of sound and music in the fifties, for which the old terms were inadequate.

Music was broken down into its raw materials, and traditional concepts of form, of what constitutes musical sound, performance and notation were questioned, re-defined and 're-built', so that the new musical language aimed at a new tradition of musical culture unique to the latter half of the twentieth century.

Developments such as total serialism, chance and indeterminacy, and electronic music brought together an awareness in composers' thought of the importance of sonority as a structural element. There was a concern for the character of the individual sound within a musical work so that the appearance of the music was determined by the relationships between the timbral quality of each of the sound events. In the later 1950's and into the 1960's these considerations influenced the composer in structuring a work such that they:

'... permitted sounds to create their own context, a reversal of the traditional procedure in which the train of thought largely determined the individual sounds and their succession'. (George Rochberg) (3)

This concern for sonority allowed percussion to play an important part in creating the 'new image of music' ⁽⁴⁾, in 'beginning again'. ⁽⁵⁾

Its family of instruments and sonorities were relatively unexplored in music of the past compared to other orchestral instruments, piano and voice. Consequently, the family did not possess an established 'tradition' or 'golden age' concerning its music, performing techniques or range of expression, as the other instruments.

However, this did not mean that the other instruments were 'worn out' in respect to sound possibilities or technique - the range of music written for them after 1945 to the present illustrates their extended expressive powers - but they had acquired certain conventions of performance, sound patterns and timbral qualities in their development - a 'tradition' - through the 'tonal' era of music beginning from the Renaissance and early Baroque times. These traditional aspects and gestures had to be avoided in the new era of music in the fifties, such that their techniques and sound possibilities had to be drastically extended.

Because of the percussion family's absence of a firm, predominating tradition of performance, it became a useful agent in New Music. There had been no age of investigation of the musical expressiveness of its sonorities which influenced structure, and neither established notational criteria. Thus, in the centres of New Music in Europe and the U.S.A., there arose preoccupations with percussion sounds, indicating the emergence of a 'tradition' in percussion which would be representative of the new age and synonymous with new musical language.

As noise became acceptable as a musical sound source in the fifties - through the philosophies and music of Cage, and the electronic music studios appearing in Europe and the U.S.A. - so the noise element predominating in a large number of instruments in the percussion family could be exploited, integral to musical structure rather than as decoration or punctuation.

Stockhausen, in 'Die Reihe', volume 5, observed:

'Percussion instruments producing sounds with only approximate or completely unfixed pitches have been paid little attention; they have therefore remained on an extremely primitive level in the development of instrument-construction. This can be explained by the one-sided harmonic-melodic development in the sphere of fixed basic pitches with harmonic-partial relationships. It can therefore be said that, until today, occidental music has been mainly music of 'vowel' sounds, 'pitch-music'. (6)

And further:

'In the first half of this century, the compositions 'Ionisation' by Edgar Varese and 'Construction in Metal' by John Cage had already initiated a completely new development independent of tone-music'. (7)

In actual fact, it may be seen that the involvement of percussion instruments became more and more significant in various instrumental groupings throughout the first half of the twentieth century and by the fifties it could be said to dominate the texture.

Pierre Boulez' 'Le Marteau sans Maître' (The Masterless Hammer), (1953-4) for voice and ensemble, exemplifies this new sound and the influence of percussion. Its instrumentation involves viola, alto flute, guitar, xylorimba, vibraphone and various non-pitched percussion instruments. The sound character of the work, with sharp attacks and sudden changes in dynamics and articulation, result in a crystalline texture which is pronounced by the predominant percussion sonorities.

The important role played by the percussion in 'Le Marteau' is illustrated in the big parts for xylorimba and vibraphone.

Even the ways the non-pitched percussion instruments are used reinforce the new attitude to percussion sound as part of the musical structure. Rather than supply rhythmic support background colour, these instruments contribute distinctive contrapuntal lines to the texture. This is revealed in the clave and bongo parts in the seventh movement. (Figures 2.1 and 2.2).

CHAPTER 2, FIGURE 1

Musical score for Chapter 2, Figure 1. The score is written for four instruments: Flute (Fl.), Xylophone (Xylo), Vibraphone (Vibr.), and Claves. The Flute part is marked *en sol* and features a melodic line with various dynamics including *ff*, *f*, *mp*, and *pp*. The Xylophone and Vibraphone parts are marked *ff* and *f*, with the Vibraphone also including *pp* and *p* markings. The Claves part is marked *ff* and *p*. The score is divided into measures, with time signatures of 6/8, 4/8, and 5/8 indicated. The Claves part includes a *pp p* marking at the end.

CHAPTER 2, FIGURE 2

Musical score for Chapter 2, Figure 2. The score is written for four instruments: Flute (Fl.), Xylophone (Xylo), Vibraphone (Vibr.), and Claves. The Flute part is marked *en sol* and features a melodic line with various dynamics including *f*, *mp*, and *pp*. The Xylophone and Vibraphone parts are marked *f* and *mp*, with the Vibraphone also including *pp* and *p* markings. The Claves part is marked *ff* and *p*. The score is divided into measures, with time signatures of 6/8, 4/8, and 5/8 indicated. The Claves part includes a *pp p* marking at the end.

The way Boulez has meticulously notated these percussion parts is indicative not only of his own personal style, but also reveals certain characteristics of the new approach to percussion sounds and their notation.

The relation between notation and idea, associated with new performance possibilities, is in fact a fundamental consideration in new musical thought, and is especially pronounced in 'Le Marteau's' percussion notation. This is exemplified in the triangle part at the end of the fourth movement. (Figure 2.3).

CHAPTER 2, FIGURE 3

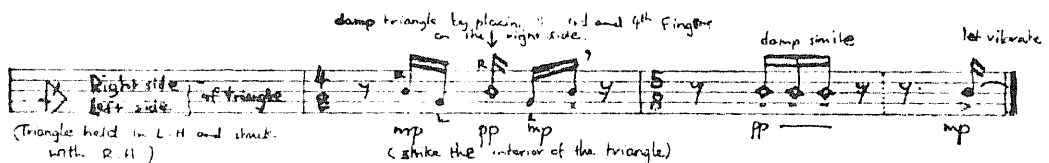


Figure 2.3 shows how an extension of the range of sound of a simple percussion instrument such as the triangle is accompanied by a suitable accurate notational procedure for its execution.

In fact, the period of music in the fifties and sixties could be seen as one of experimentation and consolidation for percussion instruments, as a means of exploring new concepts of notation and performance.

However, it is worth noting that even where percussion instruments were not directly involved, the general character of the music and the ways the sound materials were employed displayed certain associations with the character of the percussive sound.

The new techniques and sounds explored on traditional orchestral instruments, piano, voice, etc., moved away from their established sonorities in favour of ones where non-pitched qualities predominated. Other characteristics of sound were thus investigated for their potential expressive, structural possibilities, reducing the importance of pitch in music.

Electronic music introduced a new compositional process into music where the vocabulary was redefined and a precision of expression was achieved never before possible. Potentially any sound a composer wished for could be realised, such that the composer had to consider the construction of each parameter of sound in composition. The composer was now working with all aspects of sound and its components in the musical structure.

Cageian philosophies centreing around 'chance' operations acknowledged the validity of any sound in the environment, including noise, as a musical sound event.

The new orchestral concepts dealing with massed sound events, such as those presented by Penderecki and Xenakis, also emerged in the 1950's. New orchestral sonorities and methods of organisation arose from these developments, which laid emphasis on sound characteristics other than pitch as a means of structuring.

Sound concepts and trends such as total serialism, indeterminacy, electronic music and orchestral sound mass thus characterised new attitudes to musical composition, which created the necessity of exploring percussion, not only for new sound qualities, but also in investigating new constructional ideas.

TOTAL SERIALISM

The concept of total serialism was essentially a structural process of a most objective and rigorous kind, and, because of its compositional considerations, may be seen to lead the composer towards an awareness of the structural importance of the elements of sound.

"Structuring" (the organisation of musical material) by means of total serialisation was the first step the new music took beyond Webern. This extension of the serialisation process to all parameters brought about a heightening of interest and investigation into the qualities and components of sound'. (8)

It was more a method of construction related to 'sound-music', than to 'pitch-music' of the past, and which later was applied to the organisation of early electronic music of the Cologne studio.

Percussion music contributed much to the developments related to timbre composition from the late fifties onwards, and it is important to understand the part played by the features of total serial music in this respect.

Total, or integral, serialist procedures determined the existence of each note of the music in terms of a serial ordering of its pitch, duration, intensity (dynamic) and attack. Each note or 'point' had a logical, rational place in the structural context according to a serial principle and each of its characteristics were controlled; the principle gave each note an individuality and significance equal to every other note in the musical discourse.

'Every note has a fixed register and allows no other note within its preserve; each note has its own duration, its own pitch, and its own accentuation'. (9)

The resultant appearance of the music was a largely 'pointillistic' texture in which each note was extremely differentiated from the preceeding and following note in its character and sonority. The notes were:

'points amongst other, existing for themselves, in complete freedom and formulated individually and in considerable isolation from each other'. (10)

This isolation of each note, dealing objectively with its parameters in a serial arrangement, produced an awareness in composers' thinking of the quality of a sound and what properties constitute its character. Since pitch, dynamic, attack, duration, and sometimes register, were each dealt with serially, the composer had to consider each parameter separately, deciding on a row of values for each of these elements. They were all equally important in creating contrasts constantly throughout the work, determining the isolated note structure as well as the overall appearance.

Rather than producing a continuity of pitch-melodic relationships, the music's shape resulted in a composition of textures, variations of density, where, although pitch contributed to the sound character of the notes, it was the relationship between their sonorities which became the most important aural factor.

Although total serialisation was concerned with structure and organisation, and possessed inherent problems and contradictions between the intense structuring and the almost chaotic, formless result, its aims were directed at the organisation of sound, rather than pitch and a play of motivic, rhythmic figures. It thus may be said to be a step towards sound-composition which recognised the importance of timbre as a structural device.

The new musical image that was thus evolving created an atmosphere that recognised the use of percussion - especially the sounds of indefinite pitch - as musical material, and music for percussion instruments as valid musical works. The awareness of the other parameters besides pitch as structural elements, revealed by the total serial music processes, could be said to be directly related to considerations concerning the music and qualities of percussion. Previously, in pitch-oriented music, percussion served a supportive, ornamental role, but now, in the music after the Second War, this aspect could be realised as a potential sound element integral to the organisation and structure of the new musical language.

ELECTRONIC MUSIC

The introduction of electronic means of producing and controlling sounds, dealing with sounds on magnetic tape, could be said to have had wide-ranging effects on the shape and development of the New Music after 1950.

In the early 1950's there were two distinct streams of electronic music production: 'pure' electronic music (concerned with the precise creation and control of sounds using wave-form oscillators), and 'musique concrète' (based on real sounds from nature or instruments, subjected to manipulation). The former was centred in Germany, in the Cologne studio, which emerged from efforts to realise complex serial ideas effectively. The latter process stemmed from France, in the Paris studio. Studios also existed in the U.S.A. and Italy. As the decade progressed, however, these approaches cross-fertilized, such that a blanket term 'electronic music' may be used to describe the medium which involves all aspects of the creation, composition and control of music with electronic means.

Music for percussion instruments owes much to the development of electronic music, in creating musical compositions using almost any sound as its material, where timbre is able to assume structural importance. Indeed, the structure of percussion music and understanding of its material, possessing a potentially limitless sound source is directly linked to electronic music and its problems concerning the control and choice of sounds. For example, works such as Stockhausen's 'Zyklus', Makoto Shinohara's 'Alternances', and 'Continuum' by Kazimierz Serocki display influence of electronic music in selection and organisation of their material.

To understand the connections more fully, it is worth outlining the effects electronic music has had on New Music in general, and how these in turn are related to percussion.

Electronic music may be seen to have influenced the new approach to sound material, the spatial concept of time and duration, and the structural importance of the movement of sounds in space.

Messiaen stated in conversation with Claude Samuel:

"'Concrete" and "Electronic" Music have given us really extraordinary timbres as well as a new conception of time and sonorous space'. (11)

Rochberg, in his article 'The New Image of Music', sees the 'focal points of the new state of music' (12) as the 'nature of the sound material' and the 'handling of time'. (13)

Both these aspects had been developing away from traditional values through the first half of the twentieth century, but after the advent of electronic music and its aesthetic, the new values could be more clearly defined and built upon to create a new language of sound.

The introduction of the tape recorder made possible a flexibility in the manipulation of ideas and a precision in their control. The fact that the musical ideas were realised on magnetic tape redefined the concept of time. Each sound's duration was presented on a length of tape such that its distance in time had a corresponding distance in space. Milton Babbitt, a leader of electronic music in the U.S.A. believes:

'the most significant aspect of the tape recorder for composers is that on tape, musical time is represented by length along the tape roll'. (14)

Furthermore, Babbitt found that he could achieve any of his complex rhythmic ideas with absolute precision and control:

'Now, suddenly, we have instruments that make it possible for us to realise any of our ideas rhythmically and to realise them much more easily'. (15)

This precision was an asset of electronic music, and the concept of correlating time with space was a major influence on new approaches of measuring and notating durations in New Music. The traditional use of bars and beats could be said to have become less necessary as composers moved towards new concepts of time, in the rapid changes of metre and accent. Consequently, through the realisations made in the electronic medium, traditional time notations became inadequate for the new ideas such that proportional and spatial methods of indicating durations arose.

Cage observed the effect of electronic music on the notation of time:

'Since so many inches of tape equal so many seconds of time, it has become more and more usual that notation is in space rather than in symbols of quarter, half, and sixteenth notes and so on. Thus, where on a page a note appears will correspond to when in a time it is to occur'. (16)

Stockhausen saw the new approach to time as being closely linked with the development of new sound material. He attributed the new attitudes to time related to a freedom of the sounds to make their presence felt which he called the 'inherent time of sounds',⁽¹⁷⁾ derived from his experience with electronic music. Wörner explains Stockhausen's stand:

'Newly discovered sounds must first be experienced as having a life of their own and cannot be forced into any arbitrary rhythmical scheme'. (18)

He cites Stockhausen's 'Klavierstück VI' of 1954 as one of the earliest examples of this approach to time in his instrumental music, where: 'the inherent times of sounds were included in composition as a new temporal function in place of chronometrical or numerical time'. (19)

Electronic music's importance in the realisation of new time-concepts in New Music is acknowledged by Wörner:

'The revelation of the possibilities of electronics in composition necessarily brought with it the radical abolition of slavery to the bar-line and to the human heart-beat, and with it the discovery of whole new time-spaces for music'. (20)

Thus, in instrumental music following this, the performer began to interpret the distance between notes spatially, in proportion to their place on the page.

Consequently, certain types of performer freedoms arose in instrumental music in Europe derived from the implications of electronic music. The complexity of the notation of total serial music and its ideal execution in the electronic medium gave impetus to new directions in live music where approximations and indeterminant procedures created a spontaneity not possible in electronic music of the fifties.

Thus the introduction of aleatoric elements into New Music in Europe may be seen as a logical consequence of electronic music and complex serialism, as much as the influence of the indeterminant musical concepts of Cage and his followers in the U.S.A.. These European developments are illustrated in Stockhausen's 'Zyklus' and Berio's 'Circles' where the composers made use of various aleatoric procedures. (See Chapter 3: Parts A and B).

Although approximate, the spatial notation gave composers such as Berio and Stockhausen a way out for the notation of new time concepts in instrumental music. It was an effective way to indicate the irregularity and freedom of beat that they had strived for in the complex rhythms and sub-divisions in works earlier in the decade. Instrumental works using total serial procedures involved a notation which gave rise to the problem as to what degree it was possible for the performer to execute complex notated quantities precisely and effectively. Spatial notation could thus be said to be a solution to the complexity of serial notation. Seppo Heikinheimo explains:

'... influencing the downfall of serialism was the fact that the structures built up by means of serial regulators finally became so complex that it was easier to define them by means of global, holistic characteristics. A simple example of graphicism born of necessity is Stockhausen's 'Piano Piece VI'. (21)

A later example is Stockhausen's 'Zyklus', which may be seen as a significant development in the new approach to music notation.

The spatialisation of time to free sounds from the control of a metrical, rhythmic arrangement was, in fact, important to the whole development of New Music, and is exemplified in various percussion scores of the fifties and sixties.

A comparison between the pioneer percussion works such as Varese's 'Ionisation', Cage's 'First Construction' and Chavez's 'Toccata', based on a metric, rhythmic-motive continuity and structure, and the post-World War Two works such as Stockhausen's 'Zyklus' and Berio's 'Circles' illustrate the difference in approach to achieve a musical continuity in time. In the latter works, the percussion sounds are allowed to sound freely in the time-spaces, in that the notation, being largely of 'proportional' or 'spatial' nature, lends a freedom to the performers in creating a progression of the sounds in time. Sonority thus may be seen to dominate the music, and timbre becomes the focus of attention.

Rochberg summarises the time-sound concept in New Music:

'In the new music it is the image of space which predominates, an image in which the sound substance forms itself as the primary object of perception, its motion secondary, contingent on the structure of the sounding forms themselves'. (22)

'Sound substance',⁽²³⁾ became a focal point of New Music, and may be said to be largely due to the influence of electronic music, which presented new attitudes and problems concerning the creation of sounds and timbres. In electronic music, the approach to timbre and the types of sounds used were intrinsic to the music's structure. The simple novelty of creating new sounds for their own sake was not an end in itself for the serious composers in the medium. The concern for timbre was closely involved with the overall concept and structure of the music.

Boulez, in 'Die Reihe' Vol. 1, states:

'... we are required to create a composition which is coherent not only in its internal structure but also in the constitution of its actual sound material'. (24)

In the creation of the sound material, completely new structures were required, avoiding references to traditional sound sources, and to apply the medium to a development of its potential in building up new formal and compositional processes. Stuckenschmidt:

'The new means of production are not to be misused; they are not to emulate that which can be effected equally well or better by traditional means... Vocal and instrumental forms are eliminated, tonality, functional harmony, simple polyphony and symmetrical rhythm are suspended'. (25)

Traditional terms of melody, harmony, rhythm and instrumentation and the concepts they represented in traditional music were inadequate and too vague for the considerations the composer faced in electronic music. These traditional elements were essentially subjective 'artistic' terms whose interpretation and definition changed and expanded with the development of Western music in the past.

For the composer of electronic music, composition became an exacting process, where absolute, 'scientific' terminology was essential to the understanding of the medium. He was now dealing with the 'science of sound', a precision with absolute control over the design and production of the material that required a consideration of sound parameters rather than traditional musical parameters.

The composer's concern was for 'pitch-frequency', 'duration', 'density' and he also had to take into account the 'attack-decay' characteristics and 'intensity' of each sound separately, as well as its timbre or 'wave-structure'. All these parameters determined the character of each sound and had to be realised in terms of the musical context to form a unified overall structure. In the Cologne studio of electronic music, composers such as Stockhausen, Eimert and Pousseur pioneered its early stages, exploiting its precision in executing complex total serial structures. However, a problem existed in these early examples, in that there was a lack of timbral change in the sound material, each sound being based on the sine-wave. Roman Vlad comments on the first performance of the electronic music of the Cologne composers on 19 October, 1954:

'We thought we would hear something that human ears had never experienced before, and that these new sounds would be highly differentiated in quality. After listening for a few minutes, all these marvels of sound seemed boring because there was a common denominator in the 'timbre' which reminded us of the unauthentic sonorities of the Hammond organ'. (26)

Timbre thus became a major consideration in the presentation of electronic music as a musical experience. Boulez saw the problem confronting the electronic music composer as a structural one. This would enable the creation of a unified and coherent musical argument:

'The composer is faced with as unaccustomed a task as the creation of the sound itself. He is not faced with a projection of the traditional problems of orchestration and instrumentation, in which the choice of sound material is made according to its decorative or predominant effect, but with a choice of material determined only by its intrinsic structure'. (27)

The fact that timbre took on a structural importance could be said to influence the new instrumental music in the extension of techniques and possibilities of instruments as sound producing objects. These developments included the element of noise as a musically viable sound source. The main advance in the exploration of sounds in the instrumental field after the introduction of electronic music was in the family of percussion instruments.

In fact, the sound world of percussion may be seen to exhibit close parallels with electronic music's sound sources. A large part of percussive sounds are of indefinite pitch or are associated with 'noise'. Electronic music potentially possesses an unlimited source of sounds, but an important fact is that sounds of indefinite pitch are equally as important as sounds of definite pitch as musical material, and that the element of 'noise' occupies an accepted part of this material.

Consequently, the development of these sounds as expressive, structural material, exhibited in music for percussion, or featuring percussion, is closely related to the advance of electronic music. Stockhausen's 'Kontakte' illustrates the association and compatibility of percussion sounds with the sound world of the electronic medium. Completed in 1960, the work combines 'live' performers - a percussionist and pianist - with a prepared electronic tape. The 'live' instrumental sounds act as focal points for the audience to enable them to relate the familiar sounds of the instruments to the unfamiliar electronic sounds. Areas of 'contact' are created, where the electronic music is structured to associate with the instrumental music, and vice versa.

Heikinheimo, in his book on the electronic music of Stockhausen, states some of the composer's reasons for the use of percussion with the electronic sounds in 'Kontakte':

'... their timbre was less "worn out" and richer than that of other instruments. ... they can be used to produce either noise or musical sounds. ... it is economical in the number of players needed to produce a wide gamut of sounds'. (28)

The contact between percussion and electronic sounds was realised by Gottfried Michael Koenig in Die Reihe No. 5 (1959), where he drew resemblances between basic sound models electronic music and instrumental characteristics. In the comparison he found that the 'sinus tone' could correspond to the sound of a string or wind instrument, although he mentions that the instrumental tone already possessed timbre. (29)

Koenig continues:

'Noise corresponds to struck cymbals with the difference that the various timbres of cymbal noise are determined by the various types of cymbal and attack, whereas the white noise produced by a generator is in fact colourless, though on the other hand it can be broken down into regions that are graduated as one pleases'. (30)

Furthermore, he found that 'the impulse would have as its equivalent in such a thing as a drum beat'. (31)

Stockhausen had noticeably exploited the connections in above percussion cases in 'Kontakte', but also used the pitched impulse sound-models as contacts with the sounds of the piano and pitched percussion instruments such as the marimba and crotales.

There was a relation between the electronic medium and percussion in the field of timbre, in that both possessed unknown areas that had to be explored. Messiaen saw the increased use of percussion in New Music, particularly metallic percussion instruments, attributed to the interest in new timbres - 'mysterious', unknown sounds - due to the new world of sound discovered in the electronic medium.

'The vogue for vibraphones, bells, gongs, and all the instruments of "prolonged resonance", is explicable by the need we feel, perhaps under the influence of Musique Concrete and Electronic Music, to use new timbres, and above all, timbres which produced a certain mystery'. (32)

Through the connections in the sound material, considerations concerning the structure of percussion music from the fifties onwards form close associations with consideration encountered in the structuring of electronic music. Boulez sees a major problem in the formation of 'continuous timbre',⁽³³⁾ when structuring an electronic work into a musical continuity:

'... the composer is here compelled to choose his own material but also ... he has to consider in completely new ways the problem of a continuous timbre, an idea which is the most disconcerting of all he has to face and one never before encountered in the history of music'. (34)

The percussion family's basic wood, skin and metallic sonorities had become extended with the development of new playing techniques, introduction of new instruments, and modification of existing ones. This had created a diversity of possible percussion sound material, which made the problem of selecting instruments and sounds to form continuity and relationships in timbre a significant factor in the structuring of percussion music, as it had in the electronic medium. As in electronic music, tensions and contrasts in the continuity of a percussion work were determined and created through the choice of material and the manipulation of the sound types. This could be said to give new meaning to the idea of orchestration, which became integral to the inner structure of a work.

Boulez's view of the new attitude to orchestration in New Music is especially relevant in regards percussion music after 1950:

'As with intensity, orchestration no longer has only a decorative function which was attributed to it in the 19th Century. The way it is organised imbues it with a significance which it has never known before; it is no longer the "dressing", it is the sound phenomenon of the entire manifestation'. (35)

The above observation may be seen to derive from the effect of the electronic medium. In fact, it may be deduced that all aspects of the composition process had been influenced by electronic music, and even the composer-performer relationship.

In electronic music the composer becomes the performer. He conceives the music, constructs and controls it, and realises the aural outcome onto magnetic tape. Babbitt observes:

'The notion of performance is eliminated, not in the sense that the kinds of decisions made by performers are no longer available but that these decisions now have to be made by the composer. ... he is a composer-performer in the most complete sense of the word'. (36)

Similarly, in understanding and extending the sound world of percussion, the composer had to imagine the actions of producing the sounds, and realise the problems facing the performer. He had to consider these aspects during the compositional process. For instance, types of sticks used, method or action of producing a certain sonority, and understanding the feasibility of a succession of different sounds on different instruments played by a single performer. Here he had to allow for changes in technique for sound production on the different instruments and even for different sounds, and consider the distance between instruments to facilitate simultaneity and successions of sounds.

'Circles' by Berio exhibits these considerations at work. (See Chapter 3: Part B). 'Zyklus' also, to a certain extent in some respects, illustrates Stockhausen's electronic experience in the composition of the work, with regard to layout of instruments in relation to the layout of the score. (See Chapter 3: Part A).

INFLUENCE OF THE PERFORMER

In works like 'The King of Denmark' by Feldman and 'Persephassa' by Xenakis however, the layouts of the instruments are left to the players. In the latter work, being written for 'Les Percussions de Strasbourg', the composer left the layouts of each of the six performers' instruments up to them, understanding the virtuosity and capabilities of this ensemble and collaborating with them as to what is possible, and what is not. The positioning of the instruments is therefore left to the decision of each player to enable the most convenient and practical execution, and thus faithful interpretation of the score.

However, in Feldman's piece, the layout is determined by the performer's own conception of the work, and his choice of instruments. 'The King of Denmark', with its indeterminate elements, requires the performer to make decisions that, in the other works, were made by the composer. An example of indeterminacy as developed in the U.S.A., the work nevertheless exhibits similarities to the Xenakis piece, which is totally determined, in that the performers have been given new responsibilities in one way or other in the creation of the work.

Even in 'Zyklus' where the indeterminacy is strictly controlled, Stockhausen's layout of instruments in terms of the work's possible conception is an approximation, which may be improved upon by the performer in terms of his version, or versions, of the work. For instance, the percussionist composer, Max Neuhaus, has suggested some changes to the location of certain instruments in his notes on the performance of 'Zyklus', according to his own realisation.⁽³⁷⁾ For example, by placing the tom-toms in zig-zag fashion instead of in line, 'does not only reduce the total area of the layout, but also permits the execution of many groups of notes with one hand'.⁽³⁸⁾

Similarly, other changes are made to facilitate easier movement between instruments, so more flexibility is possible in Neuhaus' versions of the work.

The responsibility of the percussionist in 'Zyklus' is thus akin to 'Persephassa', where a faithful rendition of the music is required according to how the composer conceived it.

In fact, the four works discussed in Chapter 3, illustrate, in various ways, the importance of the performer in New Music. Even where the requirements are precisely laid down, they have been conceived in relation to the new possibilities of the instruments introduced by imaginative and creative musicians. In some cases the music was written for specific performers, and others for a certain type of player.

New directions in percussion have thus been influenced by the emergence of groups like 'Les Percussions de Strasbourg', and solo percussionists Max Neuhaus, Christoph Caskel, Stomu Yamash'ta and Sylvio Gualda.

Other musicians, such as oboist Heinz Holliger, pianist David Tudor and vocalist Cathy Berberian have had marked effect on New Music, inspiring works written especially for their talents.

The stimulus given by particular performers with special knowledge seems to have created new ideas and new developments for the composer. This close connection with the way the material is produced is similar to the directness of working with electronic sources.

SPACE

Earlier in this discussion, a quote cited from Messiaen mentioned the 'new conception of sonorous space'⁽³⁹⁾ given to New Music by the electronic medium. In this medium the movement of sounds in space had assumed an importance integral to the structure of the music. Boulez saw that in electronic music:

'... the arrangement in space becomes a structural necessity and represents considerably more than an appropriate setting for a more or less spectacular exhibition'. (40)

Stockhausen exhibits this significant aspect of electronic music in works such as 'The Song of the Youths' and 'Kontakte', where various ways of transmitting the sound between the speakers are used, constituting a vital part of the music's shape.

This aspect of electronic music had been carried over into the instrumental field, in ways unlike the uses of spatial location of orchestral forces in the past. Stockhausen's 'Gruppen' (for three orchestral groups), 'Carré' (for four orchestral groups and choirs) and Berio's 'Allelujah II' (for five orchestral groups), composed in the latter half of the fifties, were directly influenced by the spatial manipulation of sounds employed in electronic music. Wörner:

'As a by-product of electronic music, new spatial principles were found and transferred into the instrumental realm'. (41)



Many composers after Stockhausen and Berio have employed spatial location of instrumental forces in various ways. Xenakis regularly presents directions for the placement of the players in his works. For example, in 'Eonta' (1963-4, for piano, 2 trumpets and 3 trombones) the brass players are required to move to different parts of the stage at points during the course of the piece. In his orchestral works, 'Terretektorh' and 'Nomos Gamma', the players are scattered among the audience. 'Persephassa' (for 6 percussionists) is presented with each of the six players placed at points around the hall such that they surround the audience. (See Chapter 3: Part D).

In fact, in a large part of percussion-ensemble music in the fifties and sixties, the placing of the performers at specific points in a hall is as important as the placing of speakers in electronic music.

Works such as 'Persephassa' by Xenakis, mentioned above, Serocki's 'Continuum', Shinohara's 'Alternances', and 'Reaktion' by Bo Nilsson prescribe a spatial placing of the players at points about the hall, so that the sounds move in space around the audience to and from these various points, as in electronic music fed through spatially positioned loudspeakers.

A directional quality is given to the sounds which becomes an important parameter in the music's structure. The sounds surround the audience and the perception in following the music involves not only the sonorities, their relationships and succession in time, but also the sounds' direction and spatial movement.

Instrumental music thus acquired a new characteristic, which could be exploited structurally, and this could be said to derive from electronic music presentation.

THEATRE

Connected with the spatial consideration in instrumental music is the visual element, which may be described as the theatrical aspect of music.

In 'Persephassa' the spatial movement of sound masses assumes a theatrical effect where the audience experiences the movement of the sound visually as well as aurally. Brindle observes:

'... an "action" element enters into the performance, so that instead of looking and listening in one direction only, the audience participates more actively by moving its perception from one sound - source to another'.(42)

In 'Zyklus' the performer moves in a circle, clockwise or anti-clockwise according to his conception of the piece. The form of the work is thus outlined visually in performance.

'Circles' is a theatre piece in more ways than either of the above works, being characteristic of Berio's inherent, Italian theatrical outlook. The singer moves during the piece according to the musical action, but the percussionists' movements also contribute to the theatrical effect of the piece, supplying visual expression to the sonic events.

In fact, percussion is a prominent feature of developments in music theatre in the 1960's. This is clearly illustrated in works such as Kagel's 'Match' (1964-5), Berio's 'Circles' (1960) and 'Laborintus II' (1965) and Peter Maxwell Davies' 'Eight Songs for a Mad King' (1969). In these works, the visual activity of the percussionist is exploited in various ways, whether in relation to the refined actions of playing the instruments, or exaggerated movements purely for theatrical value.

The interest in the visual aspects of instrumental music in Europe may be seen to become important during and after advances in electronic music. For example, 'Circles' is in certain respects connected with Berio's electronic music such as 'Visage' and 'Omaggio a Joyce', in that it could be seen to visually present the contacts between vocal and non-vocal elements that were explored in the electronic works.

Indeed, the links between 'live' elements and electronic elements in the music of Stockhausen have always been pronounced. His live music of the late 1950's may be viewed not only as a development of his electronic works but also in terms of a response to the problems associated with pure electronic music in the 1950's.

On the concert platform, the speakers have not the presence or attractiveness of a live musician, whose gestures contribute to the audience's musical perception. Without this visual assistance the music could be said to lack the immediacy of traditional performance.

In 'live' music the audience could at least have some perception of new and unusual effects in relation to the actions of the performers. It is as if the new material requires an old context of presentation or there is a reaction in the listener.

In 'Kontakte', Stockhausen offered a solution to the understanding of the unfamiliar pure electronic sounds, by combining electronic sounds with sounds produced on stage by a pianist and percussionist. These 'live' sounds articulate and associate with the electronic sounds acting as a visual guide to the sonic events. The percussionist especially presented clear, visual expression of the contacts with the electronic sounds, acting as an intermediate element between the familiarity of the piano timbre and the unknown electronic timbres. The audience could thus 'see' the sounds on stage: as sounds came from the loudspeakers they were matched by 'live' sounds performed on the stage.

Later, in the mid 1960's, when Stockhausen began to use 'live' electronic music production on stage, percussion was again prominent. His first work in this respect was 'Mikrophonie I' (1964-5) which was to utilise a large tam-tam:

'... activated by two performers with various objects, while two others pick up the vibrations with microphones and another two control the electronic transformation of the sounds'.(43)

Although essentially 'musique concrète', this new 'live' approach to electronic music also included electronically generated sounds produced during performance. A new flexibility in 'live' electronic music production was thus emerging, opening up new possibilities for the medium in the sixties. The example of Stockhausen's 'Mikrophonie I' again shows that percussion could be seen to play a vital role in New Music development.

INDETERMINANCY

At the same time as the Europeans were dealing with precise control over the structure of their sound material in the early 1950's, indeterminacy in music, in various forms, was being explored by John Cage and others in America. However, although they presented opposing philosophies to European musical thought, their procedures could be seen to influence, to a certain extent, new directions in European music later in the decade.

John Cage, Earl Brown, Christian Wolff and Morton Feldman, together with pianist David Tudor, may be said to be the founders of the school of indeterminant music. These composers were brought together mainly through the influence of the new developments in the visual arts at the time. There was a personal association between the expressionist artists of New York and the composers of indeterminant music, and the musicians' philosophies seemed to be in fact more akin to the ideas of the visual artist than to musical precedents.



It was this attraction to the new painters and sculptors, in the way they approached and dealt with their materials, that induced the composers to work together. Brindle observes:

'Though all were composers, their main source of common interest was the visual arts, especially the work of the then thriving "New York School" and particularly... Jackson Pollock, Willem de Kooning, Phillip Guston, Franz Kline and Mark Rothko'. (44)

Feldman described the nature of these artists:

'Anyone who was around in the early 1950's with the painters saw that these men had started to explore their own sensibilities, their own plastic language... with that complete independence from the other arts, that complete inner security to work with that which was unknown to them'. (45)

Just as the artists were freeing themselves from conventions attitudes of painting, the composers strove to create music without being concerned with the established language and conventions of musical history.

Working with a basic idea of freedom from traditional concepts of music, each member applied indeterminant processes to some, or all, aspects of composition and performance. Feldman:

'... each of us in his own way contributed to a concept of music in which various elements (rhythm, pitch, dynamics, etc.) were decontrolled'. (46)

The fact that elements were being 'decontrolled' meant that decisions concerning composition which, in the past, were the composer's, now were left to the performer. The performer's role was thus equal to, if not more important than the composer's in the outcome of a work.

Cage described the purpose behind this idea as that of '... giving up control so that sounds can be sounds'. (47)

Richard Teitelbaum has written of Cage's outlook:

'it has been Cage's consistent concern to expand our consciousness and enhance our appreciation of the sounds - intended or accidental - that are always around us... believing all sounds to be acceptable musical materials'. (48)

Percussion sounds could therefore exist as relevant musical material in this indeterminant music, which accompanied an interest in the performer's spontaneous creation of new sounds with new instruments and performance techniques.



'The King of Denmark', for solo percussionist, exemplifies a type of sound world representative of this line of thought, giving the percussionist the opportunity to explore new methods of production to create a wide range of sounds. It allowed him to focus on each sound as an individual entity, free from any system of relationships. (See Chapter 3: Part C).

In an effort to free sounds so that 'the sounds would be themselves' ⁽⁴⁹⁾ the composers avoided the idea of making a work through compositional procedures which combine notes in a set musical design. Cage and his followers felt that systems detracted from the sound as pure aural phenomena, so that relationships in a particular form, rather than sonic entities, were the focus of attention.

As Cage quoted Henry Cowell, in this new music it was a matter of 'getting rid of the glue'. ⁽⁵⁰⁾ Cage:

'... in connection with musical continuity, Cowell remarked at the New School before a concert of works by Christian Wolff, Earle Brown, Morton Feldman and myself that here were four composers who were getting rid of the glue. That is: Where people had felt the necessity to stick sounds together to make a continuity, we four felt the opposite necessity to get rid of the glue so that sounds would be themselves'. ⁽⁵¹⁾

Jill Johnston observed that: 'the key to this revolution is silence'. (52)

Feldman's music, as illustrated in 'The King of Denmark', showed how silence had been made part of the sound material, a development which had been foreshadowed by Webern before the Second World War. In fact, both Cage and Feldman have acknowledged the influence of Webern, not only in the way he focussed on every sound, but more importantly, the way silence was used to define the events.

Certain aesthetic assumptions suggested by Barney Childs in reference to the indeterminant movement in the U.S.A. shows how the percussion sound may be regarded as a viable musical source.

1. 'Any sound or no sound at all is valid, as "good" as any other sound...'
2. 'Each sound is a separate event. It is not related to any other sound by any hierarchy. It need carry no implication of what has preceded it or will follow it. It is important for itself, not for what it contributes to a musical line or development'.
3. 'Any assemblage of sounds is as valid as any other'.
4. 'Any means of generating an assemblage of sounds is as valid as any other...' (53)

The practical application of these assumptions in relation to percussion are exemplified in 'The King of Denmark'. (See Chapter 3: Part C).

A diversity of notations and performance procedures accompanied the development of each of the four composers. Each created his own notations according to the type and degree of indeterminacy he desired in each work.

For example, Cage and Brown employed at times a graphic notation where the composer has little control over the outcome of the music. These scores were more designs on paper intended to stimulate the player, or players, to freely interpret the symbols. (Figures 2.4 and 2.5).

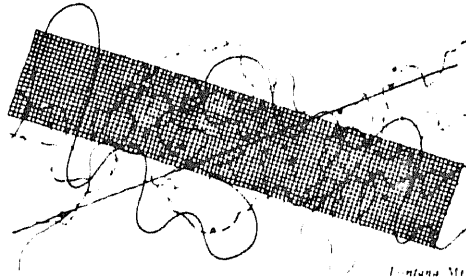
CHAPTER 2, FIGURE 4

Earl Brown "December 1952" (from "Folio")



CHAPTER 2, FIGURE 5

John Cage : "Fontana Mix". (1958).



However, the above works may be seen to represent only one form of the various indeterminant procedures and notations that emerged from this school of thought. Through the 1950's and 1960's, Cage, Brown, Wolff and Feldman approached the problem of indeterminacy and its notation in different ways. New methods had to be devised to meet the requirements of the new ideas of composition and performance in an indeterminant framework. Feldman:

'Because this music was not "fixed" it could not be notated in the old way. Each new thought, each new idea within this thought suggested its own notation'. (54)

In other pieces from 'Folio' by Brown (1951-2), he uses 'time' or 'proportional' notation. Durations and entry of sounds are interpreted by the performer by the relative length and spacing of the symbols on the page. This could be seen to pre-date European developments in spatial notation.

Wolff, in the late fifties, concerned himself with chamber-ensemble music, where he devised situations in the notations for spontaneous interaction between the players. He wished the resulting music to be a surprise to the composer and even the performers themselves.

Feldman's various approaches were different again to the other composers'. His conceptions and notation will be discussed in detail later.



Indeterminacy in European mainstream of music in the late fifties was influenced in certain respects by the American developments, but these could also be seen to coincide with advances within European musical thought in response to electronic and serial music which were described earlier. Europeans, such as Stockhausen and Berio, used indeterminant ideas and graphic notations as extensions and aids to their musical conceptions, rather than being greatly affected by the Americans' philosophies. Barney Childs observed:

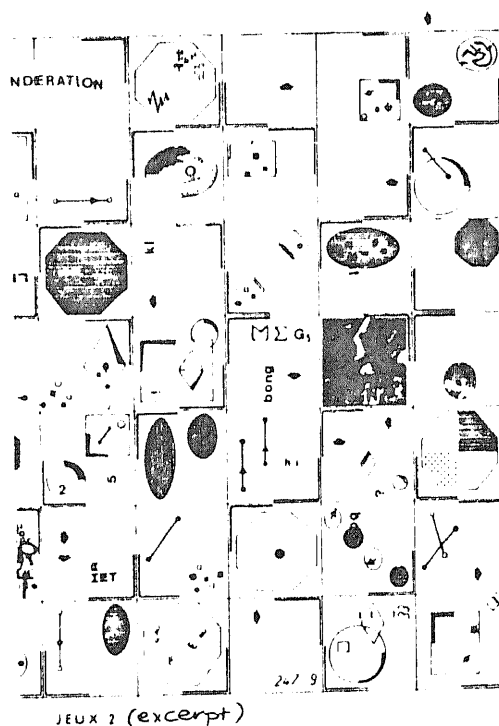
'Mainstream European acceptance was slow, most composers regarding indeterminacy and chance as simply musical devices and ignoring the aesthetic implications so vital in America'. (55)

Notational procedures in relation to the musical conceptions of 'Zyklus' and 'Circles' reflect the American influence, illustrated in the use of certain graphic indications. However, these graphic designs serve as symbols, referring to particular purposes in performance, unlike the examples of Cage and Brown.

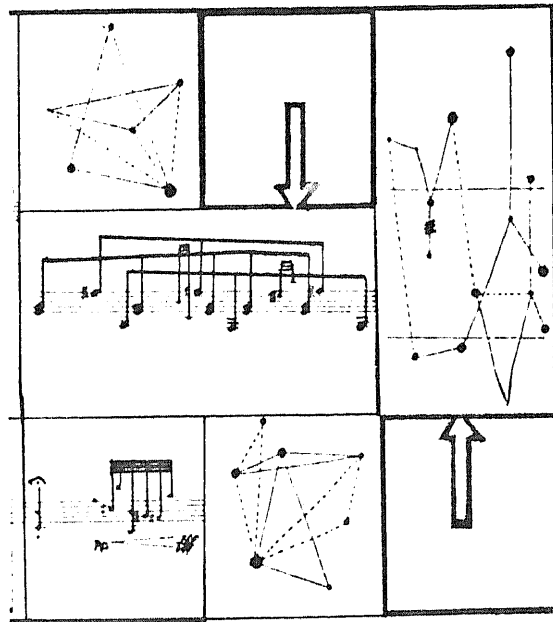
Nevertheless, some European composers followed close in the line of Cage and his colleagues, making prominent use of musical graphics. These are exemplified in the notational methods of composers such as Sylvano Bussotti and Roman Haubenstock-Ramati.

Haubenstock-Ramati, especially, revealed the compatibility of graphic notation with new directions in musical performance for percussion. 'Jeux 2' (for two percussionists) (Figure 2.6) and parts of 'Liaisons' (for vibraphone and marimba players) are examples. (Figure 2.7).

CHAPTER 2, FIGURE 6



CHAPTER 2, FIGURE 7



LIAISONS (excerpt)

Haubenstock-Ramati explains the importance of musical graphics in notation as:

'... a kind of agitation, stimulation, a provocation to improvisation that has again brought to life in our time something musically true and unique'. (56)

He continues:

'Musical graphics in its most varied forms from complete graphic representations to brief graphic structures which are interjected into a conventionally notated composition, has influenced the whole of new music with respect to sonorous material, and has obviously enriched it'. (57)

Aleatoric indications in 'Circles', 'Zyklus' and 'Persephassa', illustrate Haubenstock-Ramati's view. The effects of indeterminacy thus could be said to have wide ranging influence in various forms.

Percussion, especially, may be seen to be prominent in the exploration of new notations such as musical graphics, derived from the philosophies of indeterminacy and performer freedom. Here, a spontaneity in performance lays new emphasis on the importance of the interpreter which is exemplified in 'Zyklus', 'Circles' and 'The King of Denmark'.

SOUND MASS

A new approach to orchestral music composition emerged in the 1950's which formed a style of its own. The music of Xenakis and then the Polish school of orchestral composers led by Penderecki represented this trend. They dealt with sound mass, derived from the idea that a continuous sound event may be made up of a multitude of separate, discontinuous points of like timbre. An individual sound is thus important only insofar as its contribution to the whole mass effect. The mass is based on a statistical structure which implies that the more numerous the events the more a particular tone colour of the mass will be arrived at. Sound masses of various types occur in 'Zyklus' (tom-tom sound structure) and 'Circles' (improvisation boxes). In 'Gruppen', Stockhausen makes use of groups of events, where the individual note is subordinate to the group structure, as opposed to the pointillist structure of total serial music. However, these are only spasmodic examples in the music of Stockhausen and Berio.

Composers such as Xenakis and Penderecki employed sound mass structure consistently as a feature of their musical style. The transformation from one massed sound event with a particular character into another with different characteristics, creating a shifting of sound masses, became the focal point of these composers' musical constructions.

Xenakis arrived at his idea of orchestral sound mass partly from his conclusions derived from the dichotomy in serial music between conceived structure and the audible result. He was also interested in the sound masses he heard in nature. Xenakis therefore pursued a compositional style made up of masses of sound, and these he controlled by mathematical procedures such as probability theory and theories of large numbers.

The Polish composers, however, were influenced only by the outward appearance of Xenakis' music rather than by its inner workings. Penderecki especially was interested in colour combinations and his music from the late 1950's involved timbral effects in clusters of sound which gradually shift from one character to another.

This music could thus be described as timbre composition, where parameters such as dynamics, duration, articulation and timbre are equally, if not more important than pitch in the character of the mass, and therefore in the whole musical structure of a work.

Pitch clusters assume noise-like effect and individual pitches become lost in the overall massed sound. This is revealed in the following example from Penderecki's 'Threnody to the Victims of Hiroshima' for strings (1960). (Figure 2.8).

CHAPTER 2, FIGURE 8

16

12Vn 1-12

12Vn 13-24

10VI 1-10

10Vc 1-10

8Cb 1-8

13'' 20''

* Flageolet quartette / Flageoletone / Flageolet tones / harmoniques

Non-pitched percussion sound may therefore exist in this sound world and be manipulated like any other sound on a pitched instrument. In reference to the conception of a continuous sound being made up of discontinuous events, a short percussive point may thus be structured into a continuous mass effect. Given the range of percussion timbres, this instrumental field may be seen to provide a source of many new colours which could be integrated into the musical structure of a composition. An example is Xenakis' 'Persephassa' (see Chapter 3: Part D).

In actual fact, Penderecki and Xenakis have explored this concept not only in the use of percussion instruments but also in the new possibilities of pitched orchestral instruments and voice. Figure 2.9 is an excerpt from Penderecki's 'Dimensions of Time and Silence' (1960) for chorus and orchestra, illustrating sound masses made up of instrumental percussion sounds and percussive vocal effects. Here the forty members of the mixed chorus function as percussion instruments, combining with wood, metal and skin percussion sounds.

CHAPTER 2, FIGURE 9

The musical score is divided into two main sections. The first section, marked with a circled 46, contains vocal parts S, A, T, and B. The second section, marked with a circled 47, continues the vocal parts and introduces instrumental parts: Cub, Claves, Lgn, Bgs, Tmb, Tomts, Pttl, Ptto, Gng, Tmp, 4 Vc, and 2 Vb. The instrumental parts are arranged in a grand staff with multiple staves. The score includes a piano introduction and a main section with a 5-measure and 7-measure bar line.

Vocal Parts:

- S:** Sings the melody, starting with a circled 46. The notes are: S, T, H, D, O, F, H, D, T, P, G, H, D, S, G. The second line starts with a circled 47 and contains: D, K, S, T, P, G, G, S, P, K, T, D, D, K, S, T, P, G, G, S, P, K, T, D, G, P, T, S, K, D.
- A:** Sings the melody, starting with a circled 46. The notes are: D, K, S, T, P, G, G, S, P, K, T, D, D, K, S, T, P, G, G, S, P, K, T, D, G, P, T, S, K, D.
- T:** Sings the melody, starting with a circled 46. The notes are: S, T, H, D, O, F, H, D, T, P, G, H, D, S, G. The second line starts with a circled 47 and contains: D, K, S, T, P, G, G, S, P, K, T, D, D, K, S, T, P, G, G, S, P, K, T, D, G, P, T, S, K, D.
- B:** Sings the melody, starting with a circled 46. The notes are: D, K, S, T, P, G, G, S, P, K, T, D, D, K, S, T, P, G, G, S, P, K, T, D, G, P, T, S, K, D.

Instrumental Parts:

- Cub:** Cubano baton, playing a rhythmic pattern.
- Claves:** Claves, playing a rhythmic pattern.
- Lgn:** Conga, playing a rhythmic pattern.
- Bgs:** Bateria, playing a rhythmic pattern.
- Tmb:** Tombo, playing a rhythmic pattern.
- Tomts:** Tombo, playing a rhythmic pattern.
- Pttl:** Pito, playing a rhythmic pattern.
- Ptto:** Pito, playing a rhythmic pattern.
- Gng:** Gong, playing a rhythmic pattern.
- Tmp:** Tmp, playing a rhythmic pattern.
- 4 Vc:** 4 Violins, playing a rhythmic pattern.
- 2 Vb:** 2 Violas, playing a rhythmic pattern.

Bar Lines:

- 5th:** The first section ends with a 5-measure bar line.
- 7th:** The second section ends with a 7-measure bar line.

Footnote:

46. The first measure of the introduction is shown for the instrumental parts. The notes are: S, T, H, D, O, F, H, D, T, P, G, H, D, S, G. The second line starts with a circled 47 and contains: D, K, S, T, P, G, G, S, P, K, T, D, D, K, S, T, P, G, G, S, P, K, T, D, G, P, T, S, K, D.

Penderecki especially exploits new instrumental effects on string instruments, exemplified in works such as the 'Threnody to the Victims of Hiroshima', 'Anaklasis' (1960) and 'Polymorphia' (1961), many of which are percussive in character. He also made prominent use of percussion instruments throughout his development, introducing unusual sounds such as filing the edge of a piece of glass ('Fluorescences' (1962)) and using new techniques such as bowed tam-tams and cymbals.

The interest in instrumental colour and use of noise-like sounds makes the sound world of the composers of sound masses akin to electronic music composition. As in electronic medium, these composers are concerned with timbre and control of material not thought of as musical before. Consequently, percussive sounds may be seen to occupy an important part of their sound palettes, in the search for new materials and forms, aiming to create a new musical language.

COLOUR - INSTRUMENTAL AND VOCAL EXTENSIONS

New possibilities of sound production from 1945 have been inherently linked with new compositional developments discussed in the previous sections. Perhaps more than ever before, composers have sought to extend the range of sound material to express the climate of a new social and technological age. The move away from traditional values in musical thought, illustrated in the various trends, has induced the introduction of non-traditional elements and new methods of sound production on conventional instruments. Thus, the influence of non-Western cultures and the use of material not previously thought of as musical have been prominent in composers' search for new sounds. In both cases, percussion has played an important part.

The interest in colour has been a driving force in music from the fifties, characterised by the broadening of musical sound to include the whole sound spectrum from precise pitch to noise. Brindle acknowledges this attention to new colours in New Music, especially:

'... the creation of that brittle, almost metallic kind of sound, which is so representative of our age and has come to dominate our music'. (58)

Consequently, new approaches to instruments and voice have exhibited a predominance of sounds which possess non-pitched, percussive qualities. For example, on string instruments, effects have emerged like striking the body of the instrument in various ways, and unusual bowings. These are exemplified in the string writing of Penderecki. Wind instruments have been explored in relation to the performance of pitch clusters (multiphonics), tapping the keys (key clicks), blowing into the instrument without vibrating the reed or lips, and fluttertonguing. Exploration of the voice has involved the musical use of sounds like tongue clicks, popping sounds by lips or cheeks, whispering, and emphasis on consonant sounds such as 's', 'sh', 'z', 'b', 'd' and rolled 'r's'. The new approach to voice is exemplified in the music of Berio, and will be discussed in Chapter 3 in reference to 'Circles'. This work especially illustrates the relationship between new vocal usage and percussion.

Generally, however, it could be said that the extension of musical sound possibilities in New Music has been most prominent in the area of percussion instruments. Just as orchestral instruments and voice have been explored, so the existing traditional percussion instruments have developed a wider range of possibilities, with unusual playing techniques and use of various sizes and types of beaters. These are discussed and catalogued in books such as James Blades' 'Percussion Instruments and their History'⁽⁵⁹⁾ and Reginald Smith Brindle's 'Contemporary Percussion'.⁽⁶⁰⁾

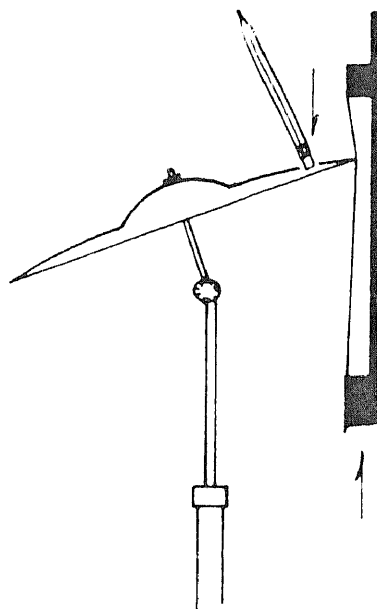
'The King of Denmark' illustrates new possibilities of percussion performance using only fingers, hands and arms. Berio exploits various subtle effects in 'Circles' obtained with use of wire brushes and fingers. Stockhausen's 'Mikrophonie I' exposed a vast range of sounds available on one tam-tam, while Roger Reynolds in 'Ping' (1968) explores the various ways a cymbal may be bowed or scraped.

In reference to cymbal bowing in 'Ping', Reynolds writes:

'The performer prepares a cymbal by marking correct bowing and stopping points for each found pitch with a wax pencil. A variety of pure pitches are available on every good cymbal and may be determined by experiment. Press a pencil eraser firmly against the upper surface of the cymbal and stroke the bow upwards (or, if the cymbal is stopped on the under surface, stroke downwards). Experiment with different stopping and bow positions (stopping positions are usually between one and five inches in from the edge) so that numerous reliable combinations of stopping nodes and bowing points on the edge emerge'. (61)

(See Figure 2.10).

CHAPTER 2, FIGURE 10

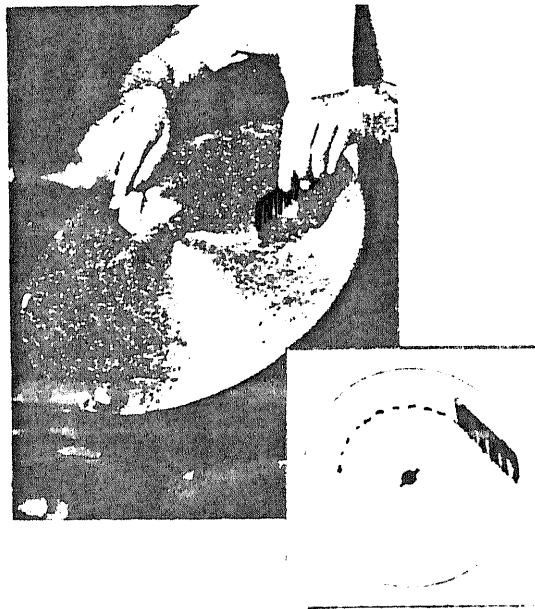


And with regards scraping sounds:

'... brushing the small tips
of two hard rubber combs
circularly around the cymbal surface
produce high, singing, delicate
skrieaks'. (62)

(See Figure 2.11).

CHAPTER 2, FIGURE 11



The bowing of pitched metallic percussion instruments
such as the vibraphone and crotales has also been
investigated to extend timbral range.

The influence of non-Western cultures has been a rich source of new percussion instruments in Western music. The increased communication with all parts of the world, resulting in a more cosmopolitan outlook in Western music, has made the introduction of these instruments not only more possible but also necessary. From the Orient came a rich array of metal instruments, such as sets of gongs, tam-tams, crotales, temple blocks, wood blocks, wood and glass chimes and chinese cymbals. Various Latin-American percussion instruments have also become prominent: bongos, congas, timbales, claves, cabasa, chocolo, guiro, maracas, cowbells. From Africa came various types of drums such as the wooden slit-drum, and wood keyboard instruments, like the marimba via Latin-America.

New percussion instruments have been invented by people such as Harry Partch and the Baschet brothers. The latter constructed sound sculptures which were used by Takemitsu in his work 'Seasons'. However, the invention of new instruments has not been a significant development in the percussion field, but rather the modulation and extension of existing ones has been more important. The lujon (metallic bass extension of keyboard percussion), boobams (tunable tube-drums), roto-toms (rotary-tuned drums) and a chromatic scale of pitched cowbells, exemplify these types of Western percussion developments.

In actual fact, with the use of car brake drums (by Cage), the alarm clock (in Kagel's 'Match') and other unusual effects, the percussion field in New Music could be said to include any object that produces sound by striking, rubbing or scraping. However, although many possibilities of performance and sounds were available to the composer, a detailed discussion of them is beyond the scope of this study, and are nevertheless aptly described in the books by Blades and Brindle mentioned earlier.

Even so, the works discussed in Chapter 3 exemplify the types of percussion instruments and playing techniques that could be regarded as representative in New Music. A common denominator may be established in each of the works that illustrates the type of concern shown by composers in the use of percussion sounds as structural material. Although extending the range of colour has been a significant issue in regards the place of percussion in contemporary trends, these four compositions reveal a more important aspect of percussion in relation to the development of New Music: that is, the problem of structuring music using timbre.

Each work shows how the composer perceived percussion in terms of the characteristic families of wood, metal and skin. In each family there exist precise, approximate and non-pitched sounds which further distinguish the colours. More general classifications may also be considered: resonant, rich sounding instruments and dry sounding ones, as well as the registration of high to low sound approximations within each family.

A table may thus be constructed which may be seen as fundamental to composers' considerations concerning percussion material. (Figure 2.12).

CHAPTER 2, FIGURE 12

	PRECISE PITCH.		APPROXIMATE PITCH (GRADUATED SOUNDS).		NON-PITCHED	
	resonant	dry	resonant	dry	resonant	dry
SKIN HIGH LOW						
WOOD HIGH LOW						
METAL HIGH LOW						
OTHER (ie. stone, glass, etc.) HIGH LOW						

These basic timbres are further extended by various performance techniques (i.e. types of sticks and playing spots), which create different qualities and shades of colour.

In 'The King of Denmark', Feldman indicates fields of timbres in terms of high, middle and low registers, within which the precise sounds are to be chosen by the performer. Both Berio and Xenakis set out the instruments in their scores in divisions of skin, wood and metal, each family considered in terms of high to low sounds.

The field of percussion instruments and possible sound material may thus be conceived as a whole unified world of sound with various characteristics, illustrated in the table. (Figure 2.12). Rather than regarded in terms of different instruments, percussion in the fifties and sixties may be seen to be approached as a single instrument with a wide range of colour. In the works discussed, each performer uses many instruments, involving multi-percussion layouts. Max Neuhaus, for example, regards the set up for 'Zyklus' as one instrument of many colours rather than different specific ones, to aid his conception of the piece.⁽⁶³⁾

'Zyklus' and 'The King of Denmark' could thus be said to be conceived as solo instrumental works similar to the way a piece say, for piano or violin solo is composed for a single instrumental field of sound.

Just as the piano or violin possess a unified timbre within their ranges of sound, so it may be seen that timbral unity exists as an in-built feature of ensembles such as the string quartet, the traditional symphony orchestra, or other diverse ensembles consisting of pitched instruments. In these cases, timbral continuity may not be seen as a major consideration, since the music could be said to be based on the colouration of pitch qualities, where timbre is used to colour the pitch structure. However, although there was a move away from pitch as the primary structural element in New Music, it did not mean that the timbral unity of the above ensembles collapsed. Rather it may be deduced that the timbre of instruments were focussed upon, basic to the fundamental structure of musical composition. The instrumentation of works thus became inseparable from the musical structure, where relationships between timbral quality of the sounds were considered to achieve musical continuity.

The choice of instruments and the similarities between the timbres allocated to the two percussionists in 'Circles' and the six players in 'Persephassa' illustrate the composers' attention to timbral unity within the ensemble sound.

Thus, it may be assumed that music for percussion derives its structure more from the considerations of electronic music, and owes much of its development and significance in the fifties and sixties to the emergence of this medium. Consequently, the works examined in the following Chapter will reveal the problems facing the New Music composer with new musical material, where the nature of sounds, method of performance, and notation were re-evaluated and all equally considered in the composition process.

NOTATION

Alongside the creation of new compositional ideas and exploration of new sound possibilities, exemplified in percussion music, was the need to devise notations which suitably expressed composers' intentions.

Some developments in new notational procedures have been discussed earlier, in reference to the influence of electronic music and the introduction of indeterminant elements: i.e. spatial and proportional notation and musical graphics. The developments of these with respect to percussion notation in Chapter 3 will illustrate the diversity of methods which emerged in music between 1945 and 1970.

The new notations which were needed for different ideas in New Music are revealed in the approaches to percussion by Stockhausen, Berio, Feldman and Xenakis. Even so, it may be seen that various notations for similar effects have also occurred by comparing certain percussion sound qualities used by these composers. The different methods may be attributed to the distinct outlook of each composer. A detailed discussion of the individual composers' procedures in the percussion works will thus show how each has dealt with the relationship between notation and idea.

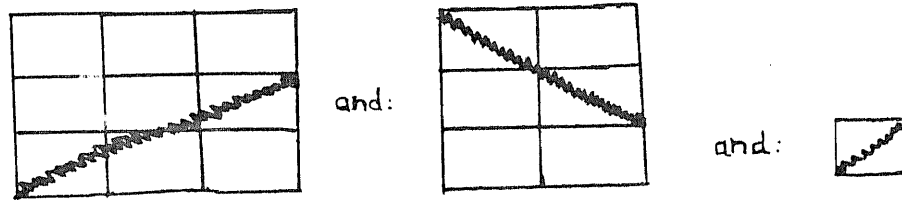
Erhard Karkoschka's book on new notations⁽⁶⁴⁾ has surveyed the range in New Music and classified them into different areas. A correlation between Karkoschka's classifications and examples of these in the percussion works will reinforce the integral part of percussion in this facet of New Music.

'Changes in traditional notation'⁽⁶⁵⁾ are illustrated in 'Persephassa', where most of the score is metrically notated, making use of stave notation for percussion instruments, accompanied by verbal instructions for types of sticks to be used and playing methods.

'Partly new principles'⁽⁶⁶⁾ include the 'notation of approximate values'⁽⁶⁷⁾ and 'notation of qualities'⁽⁶⁸⁾. The latter is distinct from the indication of quantities as in traditional procedures. The above principles are revealed in 'Circles' and 'Zyklus' which make use of spatial and proportional notations of time. However, in 'Persephassa', too, there exist spatial indications for durations, specified in seconds. Approximate values are exemplified in certain aleatoric indications in 'Circles'. In some sections of this work, qualities of sounds are specified in the form of improvisation boxes. 'The King of Denmark' also involves qualities, in the division of its score into high, medium and low sound registers, as well as qualitative designations for broad timbral areas.

'Zyklus', although exhibiting characteristics of the aforementioned principles, also approaches musical graphics categorised by Karkoschka under 'completely new principles'.⁽⁶⁹⁾ However, the work's visual designs have symbolic meaning. For instance, the size of notes indicate relative volumes, and notes joined together imply that they should be played fast and phrased together. In 'Persephassa', certain dense sound masses are graphically represented by a multitude of dots. There also exists visual presentation of changes in pitch (timpani glissandi) and dynamics, where the players follow the graduations of a wavy line. Feldman, too, employs a graphic design in 'The King of Denmark', but which may be freely interpreted by the performer. (Figure 2.13).

CHAPTER 2, FIGURE 13



'Zyklus' makes use of visual symbols for specifications of instruments. The symbols are stylised diagrams of the various instruments' characteristic shapes. (Figure 2.14).

CHAPTER 2, FIGURE 14

ie.

vibraphone : 

cowbell : 

guiro : 

tom-tom : 

Where 'Circles' utilises what is called 'line-score percussion notation' (each instrument given a certain line in a specific position on the page throughout the work), 'Zyklus' employs 'symbolic percussion notation', where each instrument, as it is needed, is represented by a graphic design.

It may be seen that the notational procedures used for percussion in all the above works illustrate the new methods of notation in New Music, influenced by the concepts discussed in this Chapter. The purpose behind these procedures will be discussed in greater detail in the next Chapter in reference to each specific work.

CHAPTER THREE

PART A: KARLHEINZ STOCKHAUSEN: 'ZYKLUS'

BACKGROUND:

Stockhausen's musical development is characterised by the absence of the repetition of sound material or structure from one work to the next. Each work is therefore independent and unique. There is a concentration in the thought and working out of musical ideas in each work, such that every aspect of structure, notation and performance related to the musical material and the concept behind the work is developed to the fullest. Consequently, all Stockhausen's works are peaks in his output, all exhibiting a thoroughness in the treatment of the musical ideas and the sound material.

Nevertheless, all Stockhausen's works may be seen to be related to one another in his musical development, in that they investigate possibilities of a new musical language, each work being a step towards the formation of this language.

Just as Stockhausen avoids repetition of ideas from one work to the next, he also avoids repetition of figures within a particular work. This may be seen as a characteristic feature of his style and approach to musical construction, such that the structures which unify each work are 'hidden' (1) and lie 'beneath the surface' (2) of the music. The composer explains in reference to 'Kontra-Punkte' (1952-3):

'Never is the same thing heard twice. Yet one has the clear feeling that an immutable and extremely homogeneous continuity is never abandoned. There is a hidden power of cohesion, a relatedness among the proportions: a structure. Not similar shapes in a changing light. Rather this: different shapes in a constant, all permeating light'. (3)

Even in the works that allow performer choice there are underlying structures, processes or characteristics that unify them. In discussing the forms of the earliest works in which Stockhausen allowed performer freedom, 'Piano-Piece XI' (1956), 'Zyklus' (1959) and 'Refrain' (1959), Roger Smalley observed the composer's reasoning behind their organisation:

'Common to all of these works is an increasingly firm sense of overall formal structure. It seems, paradoxically, that formal variability necessitated the establishment of greater overall continuity than was provided by a structure made up of a succession of groups in order that the identity of each work would remain fundamentally unchanged no matter what decisions were made by the performer. In each of these works this formal coherence is achieved in a different way - in 'PIANO PIECE XI' by means of duration, in 'ZYKLUS' of timbre, and in 'REFRAIN' of harmony'.(4)

Indeterminacy in Stockhausen's music, as it existed in varying degrees and guises in the music of other prominent European composers in the late fifties and early sixties, had little to do with Cage's chance procedures. Stockhausen's approach to performer choice had been a developing process, one in which the composer controlled the basic character of a work, but offered alternative approaches to the performer.

In the 'Piano-Pieces V-X' (1954-5), 'Zeitmasse' (1955-6), 'Piano-Piece XI' (1956) and 'Zyklus' (1959), different but progressive concepts of performer freedom had been investigated. Each posed, in varying degrees, different ideas or elements concerning performer choice. 'Interpretation' had been given new meaning such that the performer was on a new inventive level, involved in many cases as much as the composer in a work's creation.

Stockhausen's realisations about the new possibilities of instrumental music may be seen to stem from his experiences with the control and absolute precision available in electronic music. 'Pure' electronic music, explored in Cologne in the fifties, was concerned with putting ideas precisely down on tape. The absolute quality and unchangeable appearance of these works gave Stockhausen a new outlook on live music.

There had always been an element of freedom in musical performance associated with interpretation, but Stockhausen's approach more actively involved the performer in making decisions concerning elements of a work's structure. What interested Stockhausen in instrumental works from the late 1950's was the possibility of re-creating a work at each performance such that each conception, even by the same performer, would be unique.

Stockhausen explains:

'Composing electronic music involves describing sound in mechanical and electro-acoustical terms and thinking entirely in terms of machinery, apparatus, circuitry; reckoning with the single act of production and the unlimited repeatability of the composition thus produced.

Writing instrumental music-after this-involves unleashing the performer's activities through optical signs and making a direct approach to the musician's living organism, and to his constantly varying and unpredictable capacities for response; bestowing the possibility of multiple acts of production from performance to performance, and that of unrepeatability'. (5)

Works which involve performer choice such as the later 'Piano-Pieces', Zeitmasse' and 'Zyklus' thus follow electronic works like 'The Song of the Youths' (1956). 'Zyklus' in fact, is closely related to 'Kontakte' (1959-60), which combines piano and percussion with electronic tape. Stockhausen wrote in 1959:

'... the same composers who brought electronic music into being have since 1956-7 and parallel with this work published compositions which set the performer a new task. In contrast to electronic music, where all sound-events are predetermined down to the smallest detail and fixed by technical measures, the player of this new instrumental music is granted opportunities for free, spontaneous decisions inaccessible to machines'. (6)

Another factor contributing to Stockhausen's approach to indeterminacy was the contact with pianist David Tudor, around 1954-5. In actual fact, the second cycle of the 'Piano-Pieces' (Nos. V-VIII) were dedicated to Tudor. Influenced by the capabilities of Tudor as an imaginative, creative musician, Stockhausen, in the composition of new instrumental music, saw in a performer like Tudor: 'not an executant but rather a creative accomplice',⁽⁷⁾.

Karl Wörner comments:

'It was at this time, in 1954-5, that Stockhausen began to write instrumental works in which degrees of variability and polyvalence of interpretation are differentiated and worked into the composition itself'. (8)

Just as David Tudor played an important part in the concepts behind the piano music, so Stockhausen's relationship with a percussionist, Christoph Caskel, contributed much to the composition of 'Zyklus'.

'Zyklus', written in 1959 as a test piece for the 'Kranichstein Competition for Percussion Players', was given its first performance by Caskel. The character of the work, its notation and use of material could be said to be significantly influenced by Caskel's approach to percussion. He may be seen as an imaginative player, and one who thought in practical terms in relation to his medium. Caskel was aware of the possibilities of the solo percussionist, and also of the limitations. In the relatively unexplored field of percussion, and especially in solo percussion, the association with such a player as Caskel allowed Stockhausen to understand the material and its possibilities. Consequently, he could realise new structural and musical ideas, confident of their practicability in performance.

Wörner explains:

'It (ZYKLUS) was composed in close contact with Caskel, who demands extremely precise and unambiguous notation and playing instructions, and possesses an extraordinary sense of organisation'. (9)

'Zyklus' therefore, is not as free as first might appear. It has been carefully thought out, from its organisation of the material to its notation, so that the solutions for its performance are controlled by clear instructions from the composer. These instructions are based on Stockhausen's sense of musical construction, aiming to extend percussion as an expressive sound medium.

FORM:

A major work in Stockhausen's development, 'Zyklus' is unique in its design and sound material. However, in Stockhausen's evolution of ideas concerning performer choice, 'Zyklus' was also related to his works that preceded and followed it using elements of performer freedom. Written after 'Zeitmasse' (for five woodwinds) (1955-6) and 'Piano-Piece XI' (1956), it represented a further step for Stockhausen into the area of indeterminacy and variability in performance.

'Zeitmasse's' overall form is totally determined by the composer, and some matters of detail concerning 'tempo' within certain sections are left to the performers. Stockhausen first employed the principle of 'open-form' in 'Piano-Piece XI', where the choice and succession of events is up to the player, affecting the length and structure of the work. It has no fixed starting point or not fixed ending. The form of 'Zyklus' is 'open', but within a 'closed' structure. That is, the performer may begin anywhere but he must end at the point where he began. All the above works, with their different concepts of indeterminacy, are referred to by Stockhausen as examples of 'variable form'.⁽¹⁰⁾

'Piano-Piece XI' represents one of the finest examples of this type of composition process.

Wörner states:

'Applied to large-scale forms,
we find an instance of variable
formation par-excellence in
'Klavierstück XI'.⁽¹¹⁾

In 'Piano-Piece XI' there are 19 separate groups spread out on a large sheet, each of which is precisely notated. The sequence of these groups is left to the performer, who is directed to decide on the arrangement spontaneously during performance. Therefore, the overall form of the piece is determined by the performer as 'a result of momentary decisions'.⁽¹²⁾

However, Stockhausen does set down regulations which control the character of each group. These instructions which follow each group determine the way the next group, chosen by the performer, should be played. Wörner explains the performance process:

'The first group is to be played freely - with free choice of intensity, speed and mode of attack (staccato, legato, portato, and so on). But the following group chosen by the player (any one that may happen to catch his eye), must then be played according to the directions printed after the first group. Following this, the procedure is repeated in a similar way. When the performer comes to a group for the second time he is to respect the indications given in parentheses; this will give the group a new aspect. When he comes to the same group for the third time, he then plays no more; for this would constitute the first repetition. At this point his version will be ended'.⁽¹³⁾

Although the overall shape and total duration are left to the performer's choice, Stockhausen has fixed the design of each group and controls the decisions made by the performer in the relationships between the groups.

In 'Zyklus', Stockhausen went a step further into indeterminate aspects related to performance. Although an entirely unique and separate piece in character and structure from 'Piano-Piece XI', 'Zyklus' represented for Stockhausen a logical progression in this development. It also utilised and extended aspects of performance and notation exposed in 'Zeitmasse' and 'Piano-Pieces V-X'. (These will be discussed later with respect to the notational features of 'Zyklus'). Like 'Piano-Piece XI', the form of 'Zyklus' too, is 'open', but in a different way. Niel DePorte in 'Percussionist' observes:

'In "Zyklus", however, Stockhausen strives for a connection between the open form obtained in 'Klavierstück XI' and the idea of a dynamic closed form'.(14)

In 'Piano-Piece XI' the performer may begin with any group, progress through any succession of groups and end with any group. In 'Zyklus', there is no fixed starting point or end set down by the composer. However, the performer must play through the piece from a point he chooses, left to right in the sequence of pages set by the composer, ending at the same point where he began. He plays one 'cycle' ('zyklus'). The form is thus 'open' in that there is no set beginning or end, but also 'closed', in that the starting point, as chosen by the performer, determines the ending point and the direction that the piece will go. There is no absolute duration for one performance or 'cycle', but the proportions and relative distances between the notes are indicated by Stockhausen.

The form of 'Zyklus' may thus be seen as an extension of the variable idea of performance in 'Piano-Piece XI', while at the same time presenting a different view of the conditions of performer choice and indeterminacy.

Wörner compares these two processes:

'In each group in KLAVIERSTÜCK XI the sequences and constellations of notes are fixed, as are the sequences of durations and the relative durations of the groups. But these specifications too could have been made variable. Stockhausen united all the aspects of variability for the first time in ZYKLUS'. (15)

Consequently, this type of variability in the form of 'Zyklus' represents what Wörner describes as 'polyvalent' or 'multivalent' form. (German: vieldeutige form). Stockhausen gives a definition of this term:

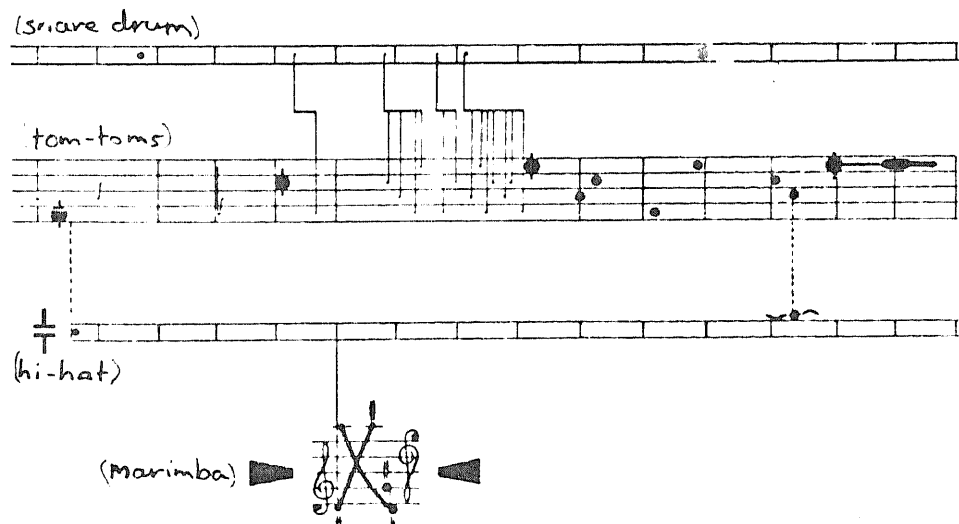
'In the genesis of multivalent forms I have tried to find not only a single valid solution but a number of different solutions that are all equally valid for all the moments that occur in the course of a context. The decision of the performer as to the version to be selected for a performance is included in the composition. The problem is to really mediate in a work between completely determined and relatively multivalent processes, to ensure that the potential solutions are not arbitrary, but that each gives an irrevocably new direction to the formal process and simultaneously affects the whole. In other words: to create freedom (with responsibility), not pseudo-freedom, without the possibility that one of the choices might give a 'better' or a 'worse' result'. (16)

'Zyklus' is written on 16 spiral-bound sheets of paper, and, read left to right, may be played in either of two directions as the score may be turned upside-down. Stockhausen presents a scheme of what he calls 'STRUCTURE TYPES', which give progressively more choice to the performer, representing a move from determinancy through degrees of increasing indeterminacy (or vice-versa, if the score is read the other way). These 'STRUCTURE TYPES' represent the 'polyvalent' formation of 'Zyklus'.

There are 17 'periods', with period 1 and period 17 being written on the same page. Each period is divided into 30 equal time-units, as a sort of grid. The performer decides on the duration of each time-unit, and this duration remains constant throughout the work.

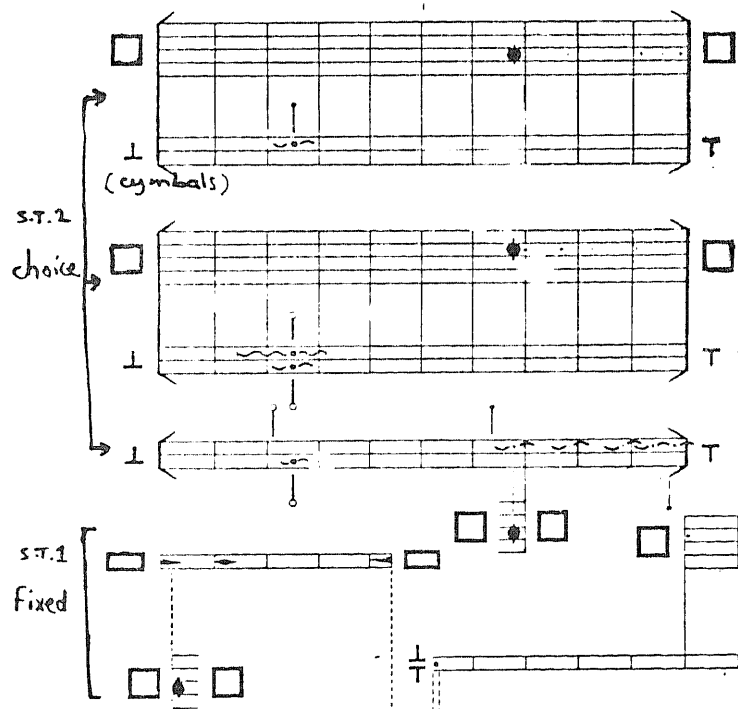
In 'STRUCTURE TYPE 1', period 1, there are no choices for the performer, and he must play all that is written according to the placement of the notes in the time-grid. This is the most determinant configuration. (Figure 3A.1)

CHAPTER 3, PART A, FIGURE 1



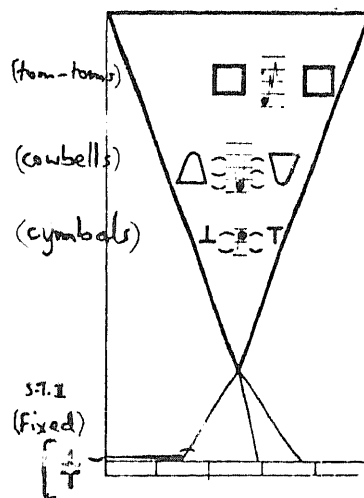
'STRUCTURE TYPE 2' is a bracketed stave. A number of these are presented above and below the time-grid, with different elements in each. Their durations and spacing of the notes within their length is notated according to the divisions of the grid. (Figure 3A.2). The performer chooses one bracket and plays the elements accordingly, for the length of the bracket. This is the first degree of choice for the performer.

CHAPTER 3, PART A, FIGURE 2



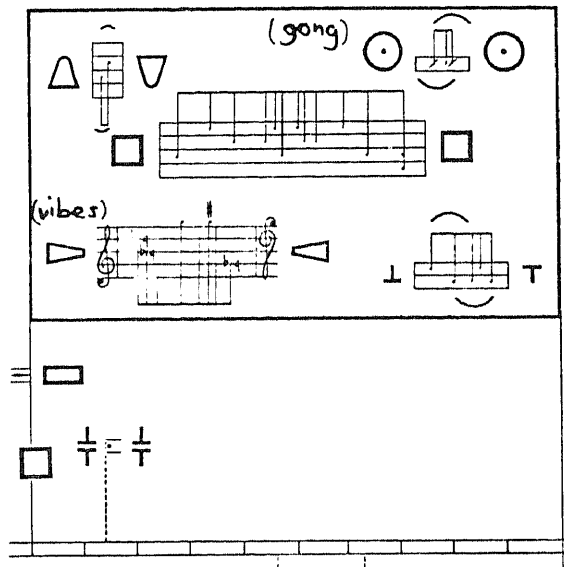
Performer choice is extended in 'STRUCTURE TYPE 3', where the performer may choose the order of elements. The elements to consider are enclosed in a triangle. However, these events (groups or dots) are to enter at specific points according to the time-grid. (Figure 3A.3).

CHAPTER 3, PART A, FIGURE 3



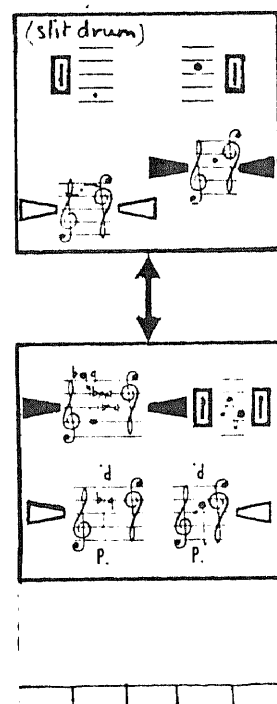
'STRUCTURE TYPE 4', allows the performer not only to choose the order of the elements but also their placement in the grid. These elements are enclosed within a rectangle and the performer is free to arrange them 'both successively and simultaneously (wherever possible)' (17) for the length of the rectangle along the grid. (Figure 3A.4).

CHAPTER 3, PART A, FIGURE 4



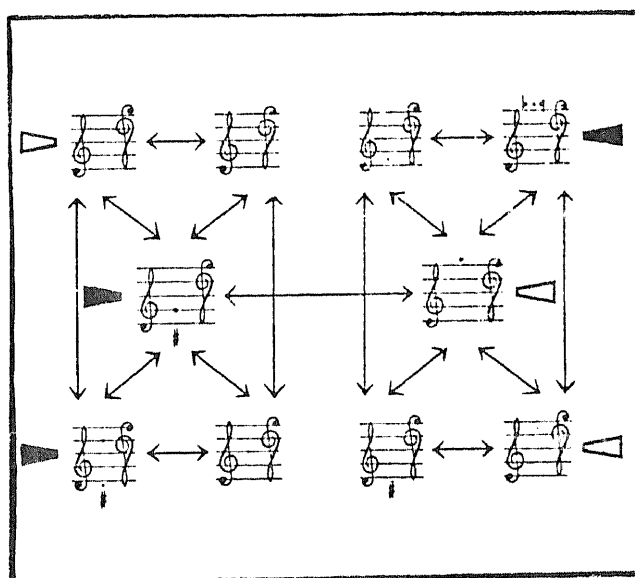
'STRUCTURE TYPE 5' increases the scope of the choices offered in 'STRUCTURE TYPE 4'. Here, there are two rectangles of elements with which to work, but an element from one rectangle must be followed by an element from the other rectangle and so on, for the length of the rectangles. The elements' placement in the grid are free, as in the previous 'structure type'. (Figure 3A.5).

CHAPTER 3, PART A, FIGURE 5

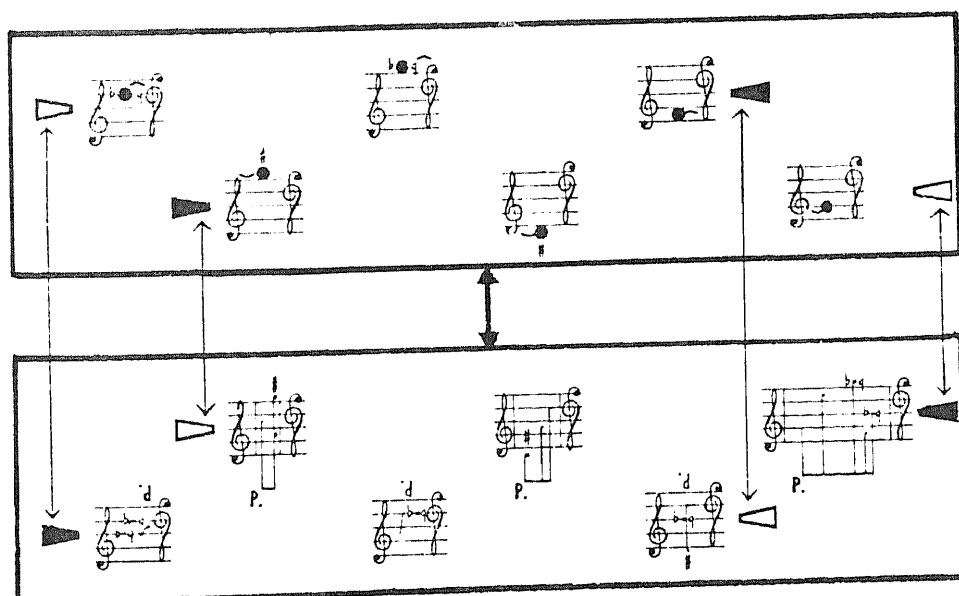


In some cases concerning 'STRUCTURE TYPES' 4 and 5, Stockhausen indicates with arrows connections between certain elements as to their succession, within one rectangle (S. T. 4) (Figure 3A.6) and between the elements in two rectangles (S. T. 5). (Figure 3A.7).

CHAPTER 3, PART A, FIGURE 6

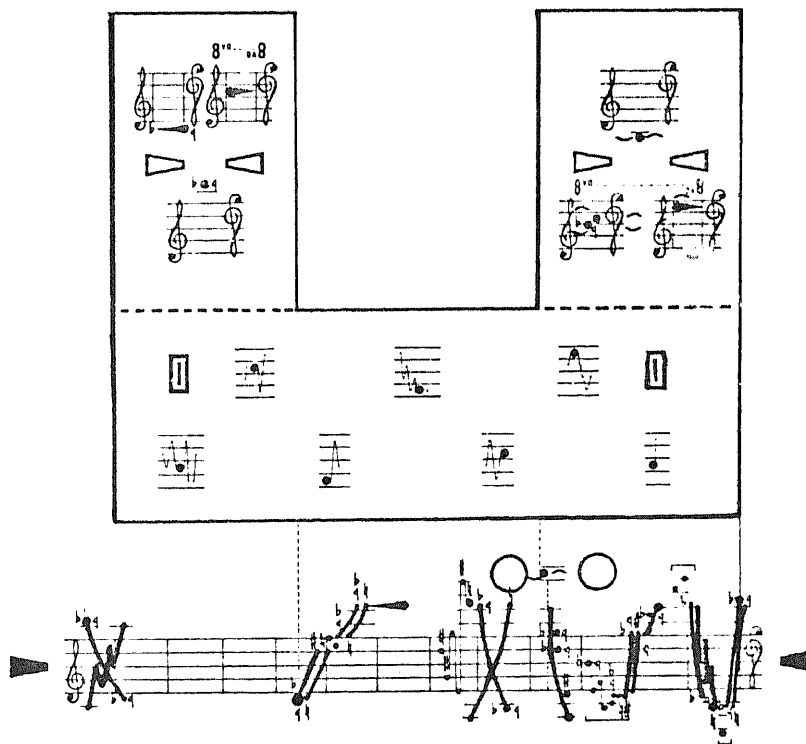


CHAPTER 5, PART A, FIGURE 7



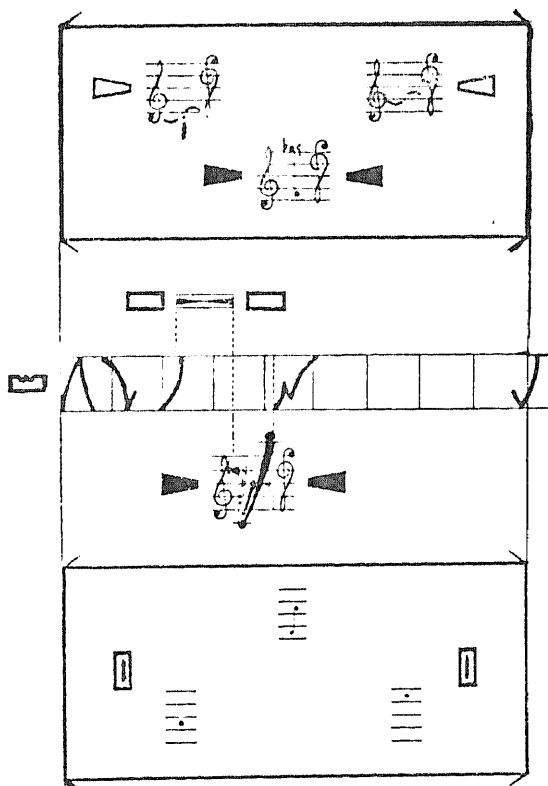
In 'STRUCTURE TYPE 6', the rectangle area of choice as in 'STRUCTURE TYPE 4' is extended. The procedure for the player to follow is the same as for the latter structure type, but in the former the range of elements to work with is extended by the addition of an extra portion. This extension corresponds to a time length along the grid, indicated by dotted lines, and the player may only use the elements in the added area for its length according to the time-grid. (Figure 3A.8).

CHAPTER 3, PART A, FIGURE 8



'STRUCTURE TYPE 7' combines the procedure of choice for rectangles with the bracketed areas of 'STRUCTURE TYPE 2'. As in the latter 'structure type', the player chooses one of the bracketed areas and plays its elements for its length along the grid. In 'STRUCTURE TYPE 7' the brackets enclose rectangles, rather than staves divided into the time units of the grid as in 'STRUCTURE TYPE 2'. The player chooses one of the bracketed rectangles, and follows the directions for rectangles as for 'STRUCTURE TYPE 4'. (Figure 3A.9).

CHAPTER 3, PART A, FIGURE 9



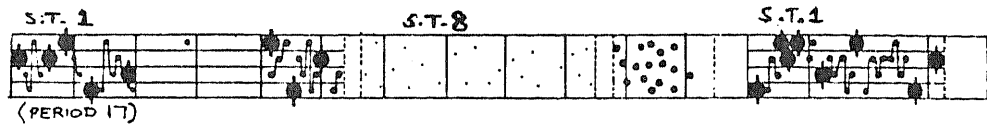
The last is 'STRUCTURE TYPE 8', which is the freest. This structure involves the tom-toms and consists of dots within the time-grid without the precise indications for the pitches and intervals of entry. The dots are distributed 'statistically', and the player interprets the speed of the points by their density and the intensity by their thickness or size. (Figure 3A.10).

CHAPTER 3, PART A, FIGURE 10



In previous 'structure types' the timbres and pitches were precisely laid down, and the performer chose the order and arrangement of the elements. Each new structure type offered more choice and range of elements with which to work. The timbres in 'STRUCTURE TYPE 8' are limited to the four tom-toms, but the new freedom here is that the performer chooses which pitch to play. Where the other 'structure types' are built around the activities of the elements on the time-grid, 'TYPE 8' is in the grid itself, and Stockhausen has joined it to the most determinant 'structure type' (No. 1) through the use of 'like' timbres (tom-toms) and similar musical character. He has welded the most determinant and most indeterminant 'structure types' to complete the cycle. (Figure 3A.11).

CHAPTER 3, PART A, FIGURE 11



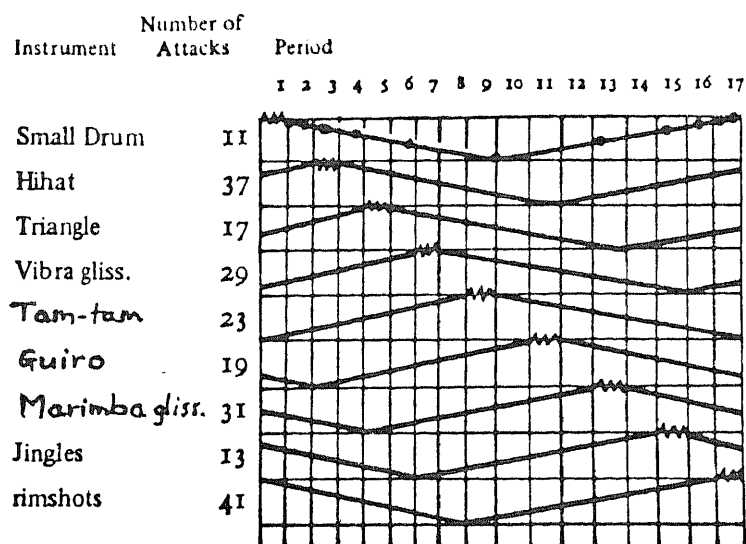
These 'structure types' contain the variable elements in the work that allows the performer to create his own 'version'/'versions'. Stockhausen has conceived the work so that - as he said in the definition of 'multivalent' form earlier - 'a number of different solutions that are all equally valid'⁽¹⁸⁾ are built into the construction of the piece.

Despite the various possible versions of 'Zyklus', by different performers or even the same performer, the 'identity' of the work, or the composer's control behind its composition, is preserved. The identity of 'Zyklus' exists in Stockhausen's selection and arrangement of the timbres through the work.

As Roger Smalley had pointed out in the quote cited earlier, Stockhausen had devised an overall coherence in each of his 'variable' works '... in order that the identity of each work would remain fundamentally unchanged no matter what decisions were made by the performer'.⁽¹⁹⁾ In 'Zyklus' this coherence is in timbre. Although some figures and their arrangement may be differently interpreted, the basic timbres are fixed. Stockhausen has set down a skeletal timbral structure which moves through different main timbres on one level, the 'principle structure', (Figure 3A.12) and a plan for the entry and use of the different instruments which is exposed in the organisation of the 'structure types', acting as a 'subsidiary structure'. (Figure 3A.13). This latter plan of events serves to blur the movement of the principal formation by increasing timbral variety and the range of the choice of instruments, or focus on it by limiting the choice of different timbres.

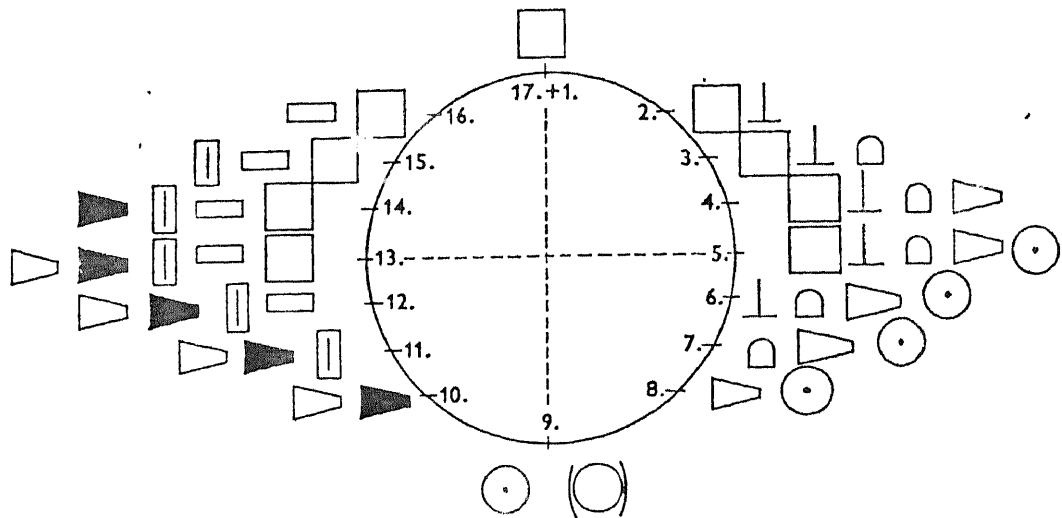
CHAPTER 3, PART A, FIGURE 12

"PRINCIPAL STRUCTURE": arrangement of peak activity of main timbres.



CHAPTER 3, PART A, FIGURE 13

"SUBSIDIARY STRUCTURE": entry and length of use of instruments within "STRUCTURE TYPES".



CHAPTER 3, PART A, FIGURE 14

KEY OF INSTRUMENT SYMBOLS.

	tom - tom		snare drum
	cymbal		wooden slit-drum (two pitches)
	cowbell		marimba
	vibraphone		tam - tam
	gong		

Various authors have explained the nature of the work's architecture:

Robin Maconie states:

"Zyklus" is basically a structure of nine layers of instrumental impulses. Each layer is assigned to a different instrument, and each contains a different number of pulses (attacks)'. (20)

Jonathan Harvey continues:

'... nine instruments play a certain number of attacks over the seventeen periods in a linear ritardando (falling line) or accelerando (rising line)'. (21)

Maconie again, on the variable elements:

'Over this skeletal structure Stockhausen has composed a second cycle of points and groups which oscillate between complete determinism (i.e. structural conformity with the basic point-complex) and various degrees of indeterminacy (statistical scatter of secondary elements within defined limits). ... Stockhausen's alternate blurring and focussing of the principal structure is beautifully controlled, and oscillates at twice its frequency, peaking at the fifth and thirteenth periods, with corresponding nodes of "no interference" at first, ninth and seventeenth periods'. (22)

These two diagrams (drawn by Stockhausen himself) present the timbres and their place in the construction of 'Zyklus'. Figure 3A.12 represents the fixed instrumental events, while Figure 3A.13 represents the use of the instruments in the variable sections of the work. The 'principal structure' has been worked out so that it basically remains the same despite the different possible versions of the piece, whether it be clockwise or anti-clockwise. The types of colours and figures that Stockhausen has used in this area defines the framework, being unlike the ones found in the 'subsidiary structure'. Stockhausen has differentiated between the characteristics of the chosen percussion instruments in 'Zyklus', so that distinctive material appears in the fixed parts, and flexible plastic events occur in the areas for performer choice.

For instance, the 'principal structure' contains characteristic figures like glissandi on vibraphone and marimba and rimshots on the drums. The material is mainly made up of rolls, tremolos and glissandi with distinct differences between the instrumental timbres. For example, snare-drum, hi-hat, triangle, guiro, tam-tam and jingles. Stockhausen refers to the tremolos and glissandi as 'shapes' and considers them a more 'determinant' sound character than the individual points or groups of points. These sounds behave as the basic identity of 'Zyklus' or the skeletal design.

On the other hand, Stockhausen has conceived the 'subsidiary structure' in such a way that the sonorities and their arrangement are more open to different interpretations. The type of material found in this structure consists mainly of isolated points or groups of notes. The latter are played as fast as possible or with *accelerandi* or *ritardandi*. These elements possess a more 'random' sounding quality than the material in the 'principal structure'. The individual points, especially, may be combined simultaneously and successively to create a wide variety of figures.

The use of the instruments in these variable configurations is illustrated in Figure 3A.13. The diagram shows how the instruments are distributed in the 'POLYVALENT' form throughout the seventeen periods. They are set down in such a way that their timbres are related and may combine in a flow between the different timbral families. For instance, the timbres of the periods 3-9 exhibit a predominance of metallic instruments, while in the periods 11-1 on the left side of the cycle show a predominance of wood moving to skin sonorities. Therefore, the introduction of a new instrument from one period to the next is devised so that the new sound is related in some way to the existing ones. For example, periods 10-11 show activity between marimba and vibraphone, leading to the introduction of the wood or slit drums. Periods 3-5 exhibit transitions from cymbal to cowbells to vibes to gong.

The combination of these two structures - 'principal' and 'subsidiary' - and the interaction between them, creates the character of 'Zyklus'. In their combination during a performance of the work we cannot distinguish two separate formations, but a continuous whole, in which the 'subsidiary' influences the 'principal' structure and the latter accepts and requires this influence. The performer decides on the interaction and the piece becomes a single construction which may be made to sound in different ways.

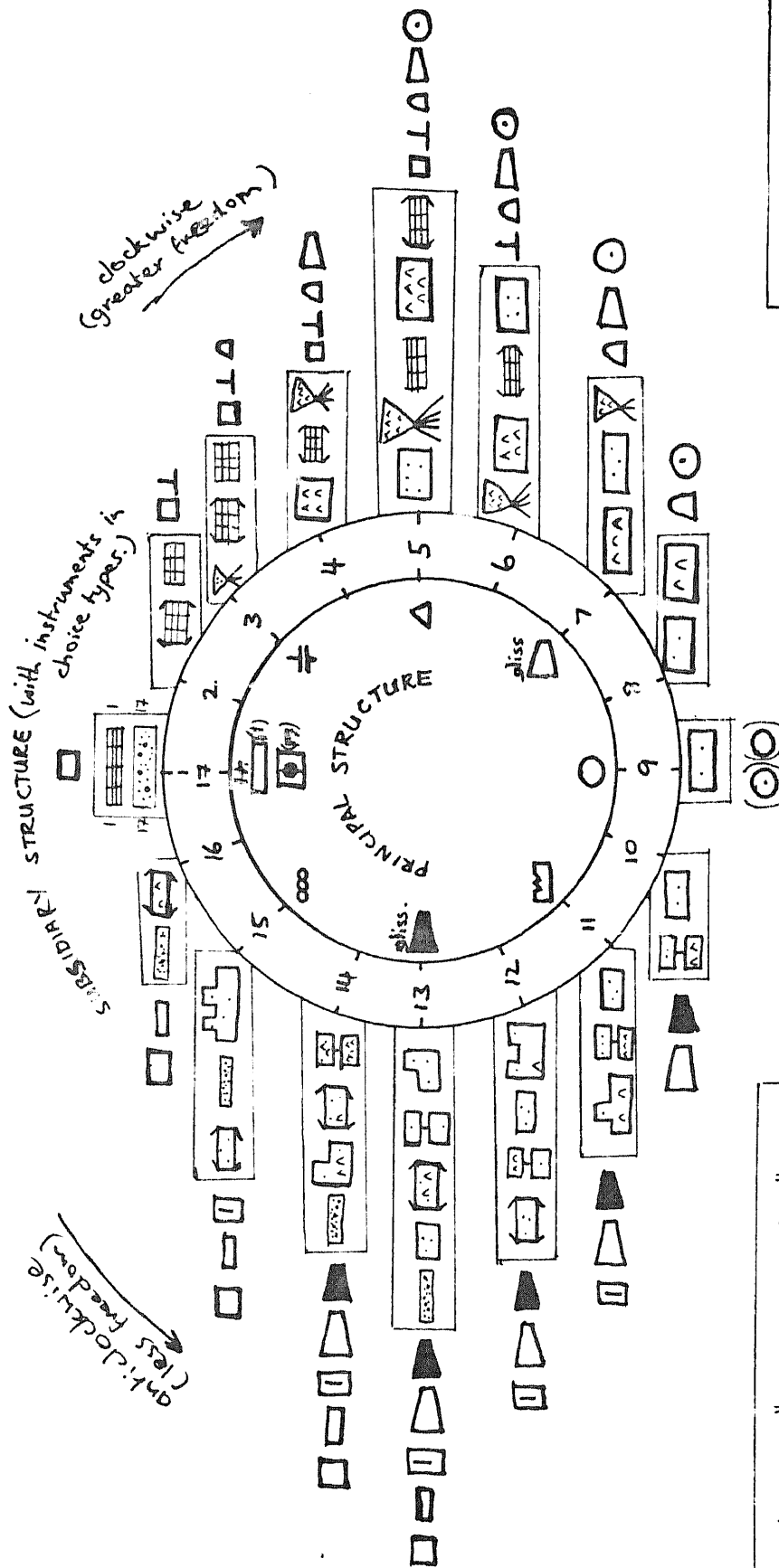
Stockhausen prescribes in the instructions for performance that in 'structure types' 3-8 'fixed and variable attacks should occur as simultaneously as possible so that complex sound mixtures result, consisting of the sounds of two or more instruments'.⁽²³⁾ If the performer has more elements to work with in the 'subsidiary structure', as in the fifth and thirteenth periods, there is more possibility for the 'complex sound mixtures',⁽²⁴⁾ that Stockhausen wants. This phenomena illustrates the effect or influence that the 'subsidiary structure' has on the 'principal structure': the 'alternate blurring and focussing of the principal structure'.⁽²⁵⁾

Maximum variety occurs when there are more timbres to choose from in the variable areas, while less variety occurs where the range of timbres from which to choose is smaller. No interference exists between the two structures in the first, ninth and seventeenth periods where there is one main timbre.

The possible simultaneity of the events combines the 'subsidiary' and 'principal' structures so that the fixed elements or timbres are 'coloured' by the variable elements. By superimposing Figure 3A.13 onto a cyclic version of Figure 3A.12, and adding the location and function of the 'structure types', the resultant timbral activity of 'Zyklus' becomes clear. (Figure 3A.15). The effect achieved by the interaction of the 'principal' and 'subsidiary' structures to form a unified architecture illustrates Stockhausen's definition of 'multivalent form':

'The problem is to really mediate in a work between completely determined and relatively multivalent processes, to ensure that the potential solutions are not arbitrary, but each gives an irrevocably new direction to the formal process and simultaneously affects the whole'. (26)

CHAPTER 3, PART A, FIGURE 15



♦ : rim-shot.
 ^ : "shapes" (more determinate).
 • : "dots" or "points" (less determinate).

KEY OF "STRUCTURE TYPES"

▨	÷ type 1	▨	÷ type 5
▨	÷ type 2	▨	÷ type 6
▨	÷ type 3	▨	÷ type 7
▨	÷ type 4	▨	÷ type 8

Niel DePonte in 'Percussionist' sees the arrangement of the 'structure types' as the basic construction of 'Zyklus': 'The structure group types are the key to the form of 'Zyklus'.⁽²⁷⁾

Robin Maconie, however, sees the material presented in the central time-grid as the main framework. (See Figure 3A.12). According to Maconie, the layout of the 'structure types' is built over this 'skeletal structure'.⁽²⁸⁾

DePonte holds the opposite view, placing the 'timbral cycle' within the 'structure type' cycle.⁽²⁹⁾

The way Stockhausen has set out the score of the work, with a time-grid running through the whole work and the areas of choice built around this grid, supports Maconie's view. Maconie sees the work from the standpoint of electronic music, its working out strongly linked to the structuring and compositional procedures in Stockhausen's electronic music. Thus the work is organised according to layers of 'instrumental impulses' ('principal structure').

DePonte views it from the performer's angle, who sees the movement from determinancy to indeterminacy, or vice-versa, constituting the form of 'Zyklus'. This view is the most obvious if one only reads the directions for the performance of the work, and it is an important development in the field of performer choice in the way Stockhausen has conceived and presented the elements of indeterminacy. However, taking into account Stockhausen's own diagrams and notes on the work, as well as the composer's European background, the importance of the inner coherence of the piece outweighs the emphasis on the indeterminant elements when the composition is closely analysed.

Thus, Maconie's view of the construction of 'Zyklus' may be seen to be in keeping with Stockhausen's musical style at this time, especially in relation to electronic music.

In his first electronic studies (Nos. I and II, 1953-4), Stockhausen used only sine-waves as the basis for the material. In 'The Song of the Youths' (1956) he introduced the 'electronic impulse' which could produce new and varying timbres.

Wörner explains:

'An impulse generator provides sequences of impulses of a particular frequency - or impulse-duration - and these sequences of impulses are filtered in order to produce timbres of yet another and entirely new category'. (30)

Koenig, moreover, in 'Die Reihe 5', made correspondence between the electronically produced 'impulse' and the acoustic phenomena of the 'drum beat'. (31)

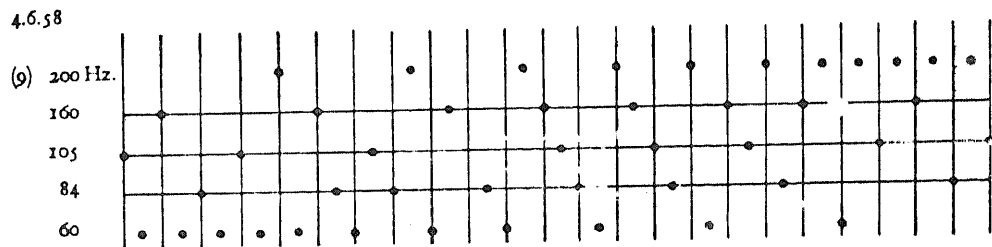
In fact, the nature of a large part of the material in the percussion family could be said to possess the character of an 'impulse'. It is therefore of natural consequence that Stockhausen's 'Kontakte' should explore the connection between electronic and percussive sound, since the electronic part of the work was constructed solely with the use of impulses.

Furthermore, as Maconie revealed, 'Zyklus' was composed at the time when Stockhausen was forming his ideas for the electronic part of 'Kontakte'. The involvement in the latter could thus be seen to help him in the organisation of percussion material in 'Zyklus'. Maconie found that the 'principal structure' of 'Zyklus' is in fact closely related to the manipulation of electronic impulses. He states:

'The basic, "skeleton" cycle of "Zyklus" is modelled on a tape-loop impulse structure originally synthesised for "Kontakte" on 4 June, 1958. In this structure five monotone layers of electronic impulses, serially differentiated in pitch (60, 84, 105, 160, 200 Hz) and "out of phase" with one another in that each layer reaches its maximum density at a different point in the cycle, are spliced together into a single tape loop'. (32)

(See Figure 3A.16).

CHAPTER 3, PART A, FIGURE 16



Each dot represents a 5 cm. section of tape. The aggregate 47 x 235 cm. was copied twice, joined 'forward' to 'reverse', and the whole rec...

The impulse structure of the electronic medium, being connected with percussion sound character, gave Stockhausen the opportunity to investigate this idea with more differentiation of timbre, using percussion material.

Maconie:

'... the sounds he (a percussionist) produces are closest to impulses, and the range of percussion instruments available offer an enormous range of sound types, from precise to indeterminate pitch, and from sharp to indistinct attack'. (33)

The basic form of 'Zyklus' may thus be seen to be conceived in terms of the extension of the electronic impulse into the instrumental domain. Comparing Figures 3A.12 and 3A.16 illustrates the relationship, showing how 'Zyklus' may be viewed as a '... spin-off, in more than one sense, from Stockhausen's electronic researches'. (34)

It could be said that this development was inevitable, in light of the fact that earlier, in 1951, many of the sounds which Stockhausen analysed in the Paris studio of 'musique concrète', were that of percussion. Evidently Stockhausen had been interested in the acoustic properties of percussion sounds for quite a time before 'Zyklus', and the composition of this work may be seen as a peak in his development which investigated new areas of performance and organisation of material.

The association between 'Zyklus' and electronic music could be said to be an important factor in these respects. Not only did electronic music influence Stockhausen's direction into the field of indeterminacy, as revealed earlier, but also may be seen to aid him in structuring percussion material. However, at the same time, percussion music helped him to clarify certain ideas derived from electronic music. Thus, the influence could be seen to be a mutual one, both mediums being concerned with the problems of timbre composition.

NOTATION AND PERFORMANCE:

The relationship between 'Zyklus' and electronic music could also be said to account for its notation of time. Where distances in time in the electronic medium are defined by lengths of tape, so in 'Zyklus', time distances, attacks and durations are specified spatially in proportion to the time-grid. Duration and attack times may be seen visually on the page, like the conception of dots or impulses on magnetic tape.

However, the notation of 'Zyklus' may be seen to be part of a gradual development in Stockhausen's instrumental music, derived from his electronic music experiences. Before discussing the work's notational procedures, it is worth illustrating some aspects of 'Zeitmasse' to understand how Stockhausen arrived at the notation of 'Zyklus' through these instrumental music developments.

'Zeitmasse' involves freedom of interpretation related, as the name implies, to 'tempo' and the concept of time. This aspect is associated with techniques of sound production on woodwind instruments, allowing for the difficulties in execution of certain notes and groups of notes, with the breathing and mechanics involved. Stockhausen wrote:

'Criteria derived from woodwind technique (taking into account the five different woodwind instruments, the prescribed registers, intensities, and intervals within groups of notes) become determinants in the organisation of time'. (35)

Speeds like 'as fast as possible' or 'as slow as possible' are determined by the techniques of the different instruments and the players' breathing abilities. For example, in bar 29 the english horn is instructed to play as fast as possible independent of the other instruments' tempo, just as the oboe from bar 34 is instructed to play as slow as possible independent of the rhythms and tempo of the other instruments.

There are sections where the speeds and rhythms are strictly notated with metronome markings, and other sections where the instruments play independently but observe the precise indications of their entries and endings. Even where the rhythms are precisely notated, dominated by groupings of three's, five's and seven's, the interpretation of the values is dictated by the tempo markings such as those mentioned above, as well as indications like 'with one breath'. Here, too, the instruments play independently, observing their separate rhythmic proportions, and coordinate only where the composer has indicated with vertical dotted lines. (Figure 3A.17).

CHAPTER 3, PART A, FIGURE 17

The musical score for Figure 3A.17 consists of five staves, each for a different woodwind instrument. The staves are labeled on the left with handwritten notes: 'oboe', 'flute', 'english horn', 'clarinet', and 'bassoon'. The score includes various tempo and dynamic markings, as well as specific performance instructions.

- Oboe (Staff 1):** Starts with the tempo marking 'so schnell wie möglich (wenigstens ca. 76)'. It features a series of notes with slurs and dynamic markings: *p*, *f*, *mf*, *mf*, *p*, and *mf*. A circled measure number 161 is present.
- Flute (Staff 2):** Includes the tempo marking 'schnell - verlangsamen'. It shows notes with slurs and dynamic markings: *f*, *sf*, *mf*, *sf*, *mf*, *mf*, and *f*. A circled measure number 163 is present.
- English Horn (Staff 3):** Includes the tempo marking 'langsam - beschleunigen'. It shows notes with slurs and dynamic markings: *mf* and *ff*. A circled measure number 164 is present.
- Clarinet (Staff 4):** Includes the tempo marking 'so schnell wie möglich'. It shows notes with slurs and dynamic markings: *mf* and *f*. A circled measure number 162 is present.
- Bassoon (Staff 5):** Includes the tempo marking 'schnell - verlangsamen'. It shows notes with slurs and dynamic markings: *mf*, *p*, and *f*. A circled measure number 162 is present.

Vertical dotted lines connect the staves at specific measure numbers (161, 163, 164, 162) to indicate coordination points. The score also includes measure numbers 112 and 132 at the end of some staves.

Jonathan Harvey explains the range of rhythmic interpretation:

'Freedom in rhythm is exemplified as indeterminacy in "Zeitmasse" ... the five instruments play in time together at one end of the scale, or all out of time at the other, creating a mass structure where the only sense of time is the length of the whole passage'. (36)

In bars 161-170 there are different rhythmic groupings for each instrument simultaneously, and also different tempo markings associated with the execution of these rhythms. Consequently, the instruments play temporally and metrically independently of one another, coordinating the note groups' entries and ends in relation to their spatial location on the page.

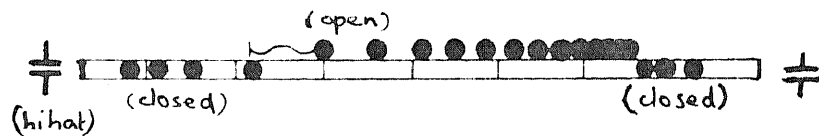
In some cases Stockhausen applied spatial notation to the execution of speed changes. For example, in the english horn part (bar 163), a tempo of 'slow-quickenning' (*Langsam-beschleunigen*) is spatially notated with greater distance between the notes at the beginning of the group, and as the speed increases the distances between the notes decreases. (Figure 3A.17). Each note in this case is written as a demisemiquaver. Conversely, 'quick-slowing down' (*schnell-verlangsamen*) as in bar 162, is written the other way, with distances between the notes progressively increasing (bassoon). (Figure 3A.17).

Stockhausen arrived at spatially notating rhythmic values in instrumental music after a period of working exclusively in the electronic medium. He exposed this notational method in the 'Piano-pieces V-X', the works immediately following his electronic compositions, 'Studies I and II'. In 'Zeitmasse', Stockhausen presented a spatial notational idea applied to the coordination of five individual instruments, and used it alongside metrically notated values and sections.

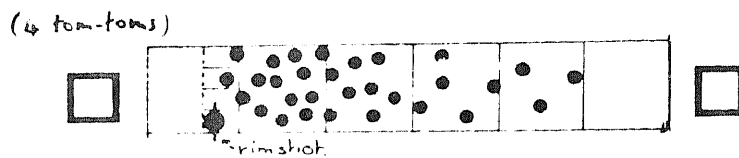
'Zyklus' represented a further step into the spatial interpretation of sounds' durations and distances between them. Distances between the sounds and durations are plotted proportionally on the page relative to the regular division of each page into 30 equal time-units. The performer chooses a duration of each time-unit and sticks to this length for the whole piece so that all the locations and lengths of the notes become proportional to one another. Stockhausen has notated the sounds within this 'time-grid' spatially, allowing the performer to interpret the placement and durations of the notes according to his own sense, relative to the time-length he sets for the grid.

'Accelerandi' and 'ritardandi' are notated similar to 'Zeitmasse', with distances between the notes progressively becoming lesser (speeding up) or greater (slowing down). (Figures 3A.18 and 3A.19). When the composer wanted a smaller scaled 'accelerando' or 'ritardando' within a smaller group of notes, he uses an arrow slanting upwards or downwards respectively. (Figure 3A.20).

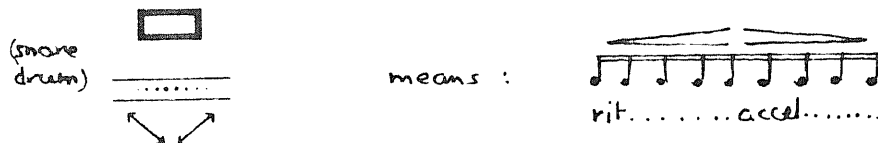
CHAPTER 3, PART A, FIGURE 18



CHAPTER 3. PART A, FIGURE 19



CHAPTER 3, PART A, FIGURE 20

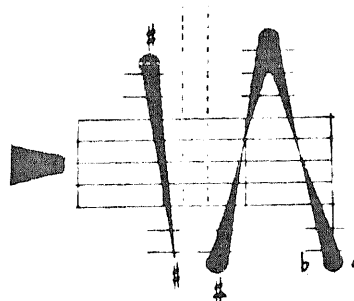


What is also revealed in Figure 3A.20 is that the intensity of a sound is notated by the note's size, or, in the case of a continuous sound, by its thickness. In Figure 3A.20 the crescendo-diminuendo, however small, is clearly notated by Stockhausen by the gradual enlargening and diminishing in the sizes of the notes. Similarly, in the notation of a continuous sound, such as a roll on any instrument (Figure 3A.21), a glissando on a keyboard instrument (Figure 3A.22), or a continuous sound on the gong or tam-tam (Figure 3A.23), the changes in intensity from one volume to another, be it gradual or abrupt, is notated by the difference in the thickness of a continuous line.

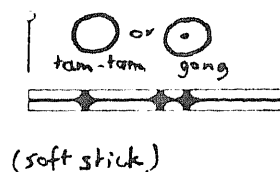
CHAPTER 3, PART A, FIGURE 21



CHAPTER 3, PART A, FIGURE 22

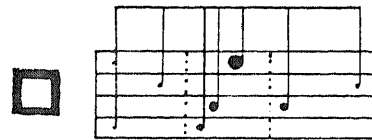


CHAPTER 3, PART A, FIGURE 23

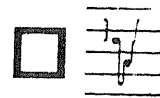


Where 'Zeitmasse' employs largely metric notation associated with metronome markings, and uses spatial notation for specific reasons in terms of a massed, dense texture, 'Zyklus' offers freedom for the performer in executing rhythmic figures and note groups with a graphic method of notating the values, but still clearly expressing the composer's intentions. (Figures 3A.24-26).

CHAPTER 3, PART A, FIGURE 24



CHAPTER 3, PART A. FIGURE 25



CHAPTER 3, PART A, FIGURE 26



notes joined
by line or
enclosed in
bracket: are
played as
fast as possible.

Here are, therefore, examples of aural phenomena corresponding to their visual representation: volume indicated by size, and placement in time by the relative location on the page. This type of notation that Stockhausen has employed in 'Zyklus' is entirely subservient to his intentions regarding changes in dynamics, densities and various rhythmic gestures.

Maconie writes:

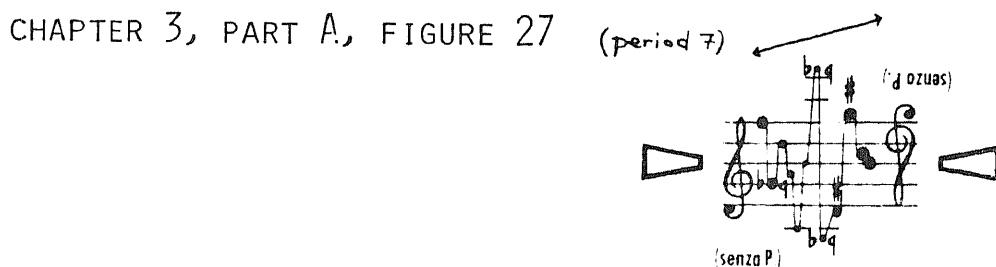
'Functional precision distinguishes Stockhausen's notation from the derivative note-forms of Haubenstock-Ramati ('Liaisons' etc.), Francois Bayle ('Points Critiques') and other minor exponents of "musikalische Grafik"'. (37) (See Chapter Two:Indeterminacy).

Despite the choices given to the performer, Stockhausen has considered the techniques and sound characteristics of each instrument. The performer's solutions as to which way he will play the piece is controlled by the composer's directions and the types of sounds and figures specified. Maconie observes:

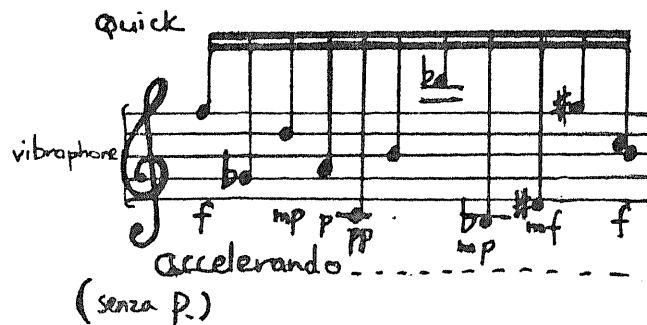
"'Zyklus' is not designed as a vehicle for mere technical display: its "freedoms" are tightly circumscribed, and allow none of the self-indulgence expected of jazz and improvisatory "serious" music'. (38)

The clarity and precision of Stockhausen's instructions for performance indicates that 'Zyklus' is a work that has been carefully thought out and structured, while at the same time creating opportunities for spontaneous reactions during performance. Stockhausen has defined the gestures or rhythmic figures on specific instruments - in other words, the basic details of the sound material to be used - and gives the performer the responsibility of deciding on the combination of these elements according to conventions he sets down.

For example, take the following group of notes for vibraphone: (Figure 3A.27):



CHAPTER 3, PART A, FIGURE 28

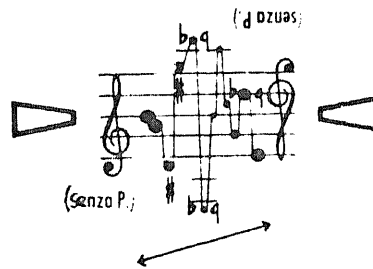


Comparisons between the two examples, basically arriving at the same result in performance, illustrates the functional design of Stockhausen's notation associated with the idea he wishes to express. The more conventional procedure, apart from being impracticable in relation to Stockhausen's variable form, seems clumsy and complex. Stockhausen's means effectively gives the performer the concept of the gesture and its execution, and this clarity becomes important to a percussionist who has to deal with many different instruments in short spaces of time. The distance between performer and score, and the fact that he has to move quite rapidly to execute the changes from instrument to instrument, means that he cannot look at the score all the time. Therefore, in 'Zyklus' the necessity of the performer to quickly focus on and react to the indications in the score becomes an important factor in the notational method. The type of notation that Stockhausen has employed could be said to be determined by the composer's consideration of the techniques and problems of multi-percussion playing, and the concept of reading the score both ways.

MILBOURNE

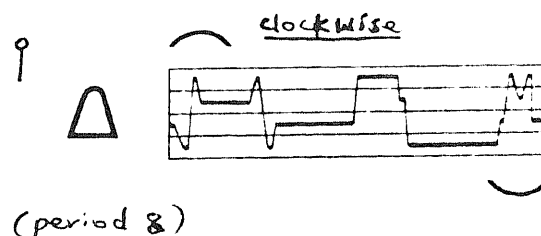
Certain musical gestures in 'Zyklus' may be seen to act as characteristic elements in the work's identity. If Figure 3A.27 was to be played within an 'anticlockwise' version of the score, the shape will still be fast with 'accelerando', with similar dynamic changes, but the order of the notes would be an inverted, mirror image of a 'clockwise' version. (Figure 3A.29). Although the pitches are not the same, the character of gestures could be said to be identical.

CHAPTER 3, PART A, FIGURE 29

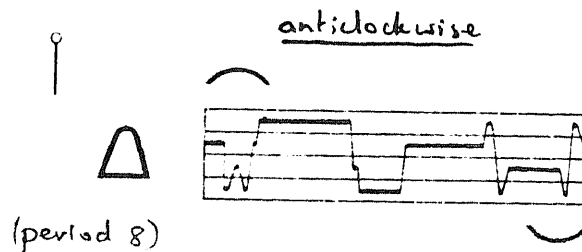


In shapes such as the following example for four cowbells (Figure 3A.30), the character of the figure as indicated by the composer assumes a distinctive quality, that if played up side-down the gesture is similar. (Figure 3A.31).

CHAPTER 3, PART A, FIGURE 30



CHAPTER 3, PART A, FIGURE 31

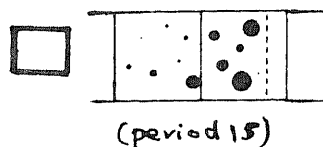


More obviously, sound events such as the tom-tom masses, the vibraphone and marimba glissandi, and the guiro scrapes exist as characteristic gestures and sonorities of 'Zyklus', despite the different ways they could be played. All the elements are defined and conceived in such a way that in two totally different interpretations, the characters are still distinct. Wörner observes:

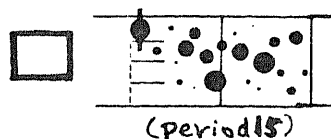
'In "Zyklus" the choice of instruments for each situation in the composition is precisely laid down. The score indicates which instruments should sound and the manner in which they are to be played'. (39)

Even in the most so-called indeterminate episodes ('STRUCTURE TYPE 8'), the composer's intention behind the effect remains clear. (Figures 3A.32-35).

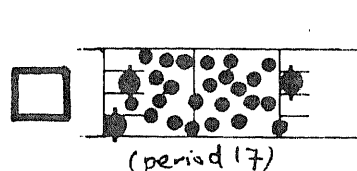
CHAPTER 3, PART A, FIGURE 32



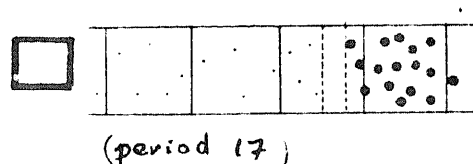
CHAPTER 3, PART A, FIGURE 33



CHAPTER 3, PART A, FIGURE 34



CHAPTER 3, PART A, FIGURE 35

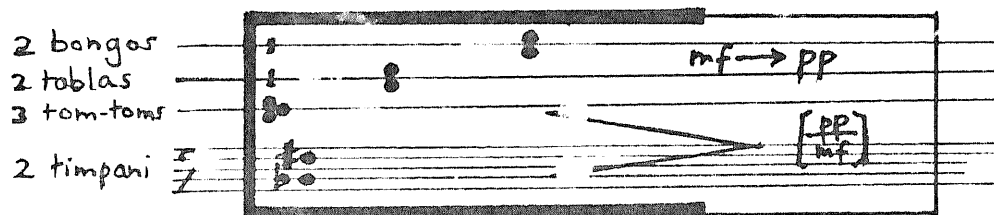


Here the tom-toms are notated without precise indications for their different pitches, within a free rhythmic scheme. The above illustrations could be said to be the most 'graphic' examples in the notation of 'Zyklus'. What the composer wants is an overall impression in these passages for tom-toms: a pointillistic skin sonority in Figures 3A.32 and 33, an explosive mass of sound in Figure 3A.34, and, in Figure 3A.35, a soft 'patter' followed by a louder, denser mass. Stockhausen presents a visual image of the desired aural effect, and the player reacts to this design given the timbre, general dynamics and general density within a certain space of time. The performer interprets each of these passages as a single gesture, without concern for which tom-tom to play at a precise point in the time-grid.

TOURNE

A similar 'mass' effect is presented in Berio's 'Circles'. In the third section of 'Circles' Berio notates the two percussion parts with the use of 'boxes' in which the players may strike the instruments free of any order of rhythmic scheme. However, like Stockhausen, Berio sets down the conditions of the indeterminacy. Within each box he prescribes the instruments to be played, the degree of density of the notes by the thickness the outline of the box, the dynamic range together with any crescendo or diminuendo, and sometimes the type of sticks to use. (Figure 3A.36).

CHAPTER 3, PART A, FIGURE 36



Brindle states:

'The rectangles or "boxes" indicate a precise time period. The lines and notes show which instruments should be played by the percussionist, but the order of the sounds is left to his own imagination'. (40)

Cope adds:

'With these methods of improvisation Berio is able to maintain control over a number of elements, while performer flexibility is available with others'. (41)

As can be seen from the example, Berio also indicates occasionally the approximate entry of new 'stacks' of notes by proportional location. Berio maintains the control of the musical direction in this 'free' section in the work, but in using this procedure he avoids complex rhythmic notation, making it easier for the performer to execute the passage, while still obtaining the desired effect.

Just as in 'Circles', the indeterminant aspects of 'Zyklus' illustrate the new role of the performer in New Music. Nevertheless, both works exemplify types of indeterminant procedures which are subservient to the composers' musical concepts. The new notations are not abstracts designs to stimulate improvisation but carefully thought out solutions to effectively communicate certain ideas.

'Zyklus' offers a type of percussion notation involving many instruments with clearly understood symbols. Particular instruments and sonic ideas are indicated by specific visual designs, just as values of time and intensity are presented visually on the page.

Since many of the instruments employed are of indefinite or approximate pitch, notation of pitch does not exist as a major consideration in the layout of the composition. Stockhausen could thus concentrate more on the notation of other parameters such as rhythm, dynamics and articulation.

It may be seen that the new notational system employed in 'Zyklus' derives not only from the fact that non-pitched materials are used, but also from its structure, in which timbre is the main feature. In fact, the work presents an example of timbre composition in the instrumental field which could be said to stem from electronic music. Considerations such as attack-decay characteristics and relationships between sound qualities to form a musical whole exist in the electronic medium, and also may be seen to be present in the composition of 'Zyklus'. It thus may be regarded as a vital link between new concepts implied in electronic music and new directions in the instrumental domain.

PART B: LUCIANO BERIO: 'CIRCLES'

BACKGROUND:

'Music is never pure: it is attitude: it is theatre. It is indivisible from its gestures'. (42)

This statement, taken from Berio's programme note for the first performance of 'Circles', for voice, harp and percussion, could be said to characterise the composer's overall musical outlook. Berio's music theatre pieces occupy an important part of his development, but the attention to the relationship between gesture and music may be seen to bring all his works into the field of theatre.

For Berio, gesture not only refers to the physical actions and movements of a performer, but also could be said to be present in the music itself, in the form of musical gesture. A single sound, or a succession or combination of sounds may represent a musical gesture, and the vocal references to such figures for instruments or electronics could be said to explain certain choices and uses of sound material in Berio's works.

George Flynn observes:

'... the notion of musical "gesture" traditionally suggests stylised imitation of vocal sounds or physical action. Expanding the usual vocal repertory to include sounds and events other than traditional singing... ... naturally broadens the range of instrumental and electronic gestures and textures, thus poetically accounting for many of the sounds in Berio's music'. (43)

Consequently, in 'Circles', the matching of instrumental and vocal gestures becomes an important structural feature. Voice-harp and voice-percussion connections determine the arrangement of the sound material, and the musical gestures of the percussion are especially made clear when viewed in relation to the vocal sounds.

Moreover, Berio also exploits the relationships between musical and visual gesture, which contributes to the classification of 'Circles' as a theatre piece. Visual and aural elements may be seen to become equally important in the musical experience of the work.

Berio comments:

'If it were possible to make the distinction, I would say that "CIRCLES" should be listened to as theatre and looked at as music...'. (44)



In opera there is action: the visual element. Physical gesture plays a major part in expressing the character of the sung or spoken words and certain situations. The vocalist is an actor as well as singer, and uses gestures to underline the meaning of the text.

In Berio's music, the idea of gesture is broadened to extend to the instrumentalists, and not only the vocalist. He has said:

'An instrument is never only the sound it produces but also the very sophisticated actions of the performing musician'. (45)

In Berio's large theatre works of the 1960's and 1970's, such as 'Passaggio' (1962-3), 'Laborintus II' (1965) and 'Recital I' (1972), the importance of this visual element is obvious. However, in works designed for concert performance, such as 'Tempi Concertati' (1958), 'Différences' (1959) and 'Circles' (1960), a staged presentation as well as the exploitation of the musicians actions in the execution of the music are integral to their composition.

Paul Griffiths observes:

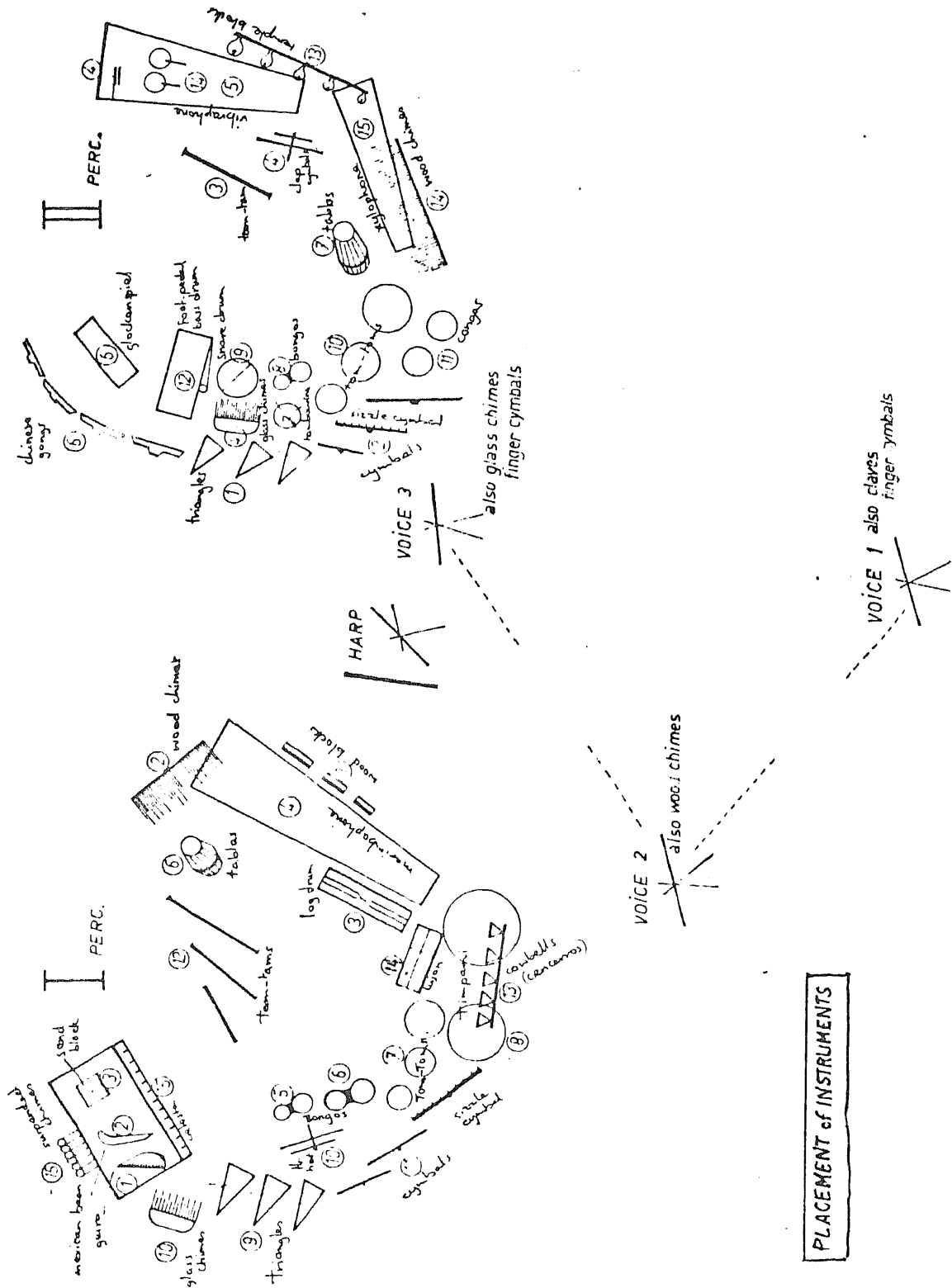
'... there is a theatrical element in much of his music, whether its destination be theatre or concert hall'. (46)

In 'Circles' each of the participants are located at certain points on the platform. The percussionists are stereophonically placed at opposite sides of the stage, the harp in between and vocalist at the front. The movements and actions of the percussionists, the movement of the vocalist around the stage, and the relative static impression of the harpist, are combined and contrasted within the flow of the aural action.

The singer's movements are indicated in the stage plan at the beginning of the score as is the placement of each of the particular percussion instruments for the two percussionists at opposite sides of the stage. (Figure 3B.1).



CHAPTER 3, PART B, FIGURE 1



POSITION OF INSTRUMENTS IN THE SCORE

WOOD

high | non-pitched
low | graded
| pitched

Skin

high | non-pitched
low | graded
| pitched

Metal

high | non-pitched
low | graded
| pitched

PERC. *

3 wood blocks
mexican down
log drum

marimbaphone

2 small bongos
3 joint tom

2 small timpani

3 triangles
hi hat
3 suso cymbals
3 tom tom
5 concheros
lujan

6 suso chimes
/ campanel

VOICE

HARP

WOOD

high | non-pitched
low | graded
| pitched

Skin

high | non-pitched
low | graded
| pitched

Metal

high | non-pitched
low | graded
| pitched

PERC. *

3 triangles
3 suso cymbals
1 tom tom
hi hat

marimbaphone

4 chinese gongs

tamburo basic

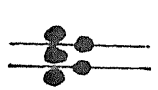
2 congas (b)
3 tom tom (b)
2 congas (b)
100 pedal bass drum (b)
5 temple blocks

xylophone

For both percussion parts in the score, the resonant instruments (metal) are closest to the voice and harp, while the driest instruments (wood) are on the outside. Each line or stave signifies a certain instrument, or group of the same instruments with different pitches. (Figure 3B.3).

CHAPTER 3, PART B, FIGURE 3

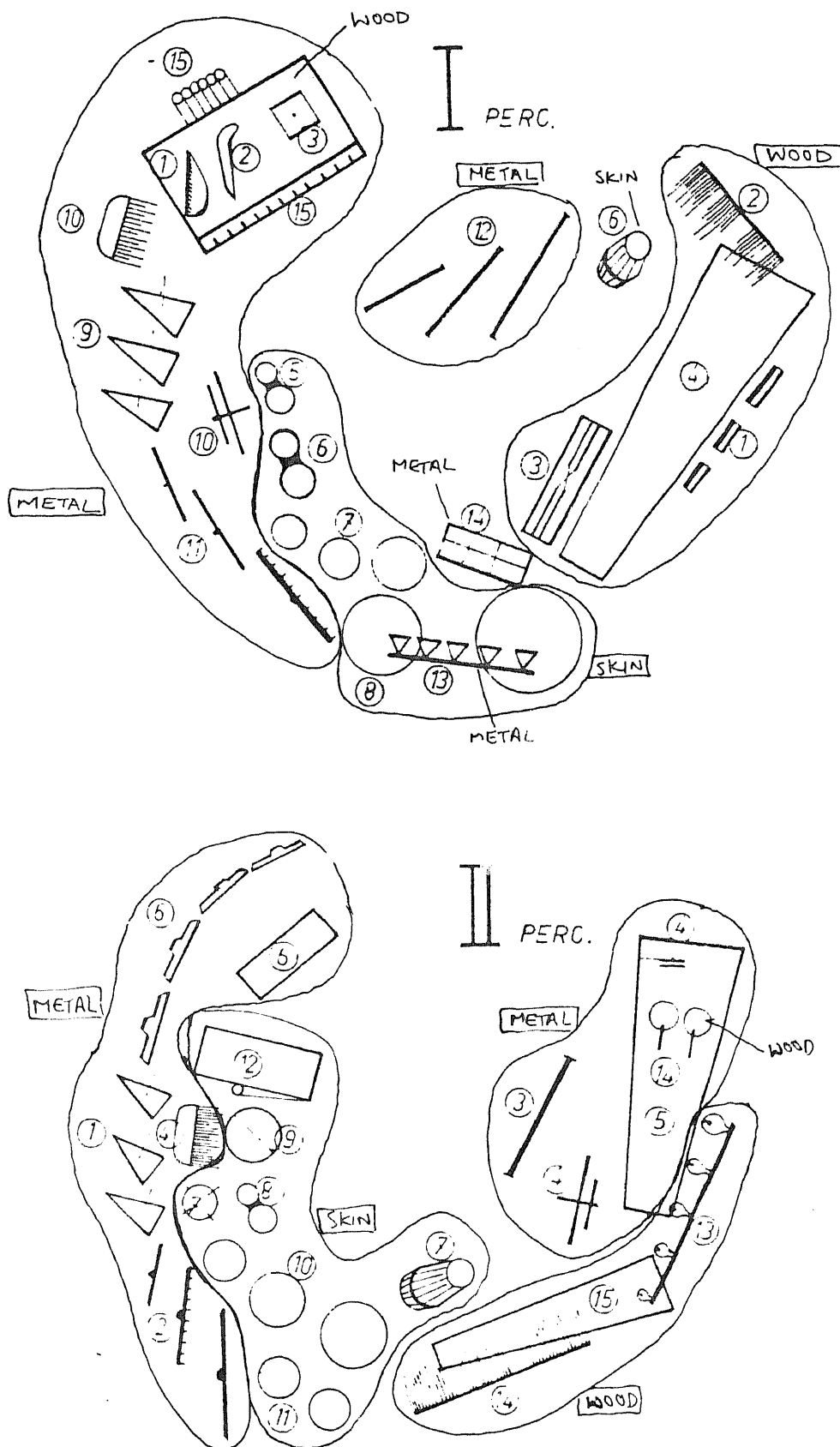
Percussion I : 3 wood blocks 

Percussion II : 5 temple blocks 

Each group of instruments and timbral category is thus differentiated in the score layout. This layout is integral to the layout of the percussion instruments and the way Berio has conceived the work. The practicality of reading the score in relation to the position of the percussion instruments has been considered by the composer, such that the various gestures and timbral combinations are clearly understood and, in fact, possible.

Each family is located in a particular region within the area of each percussionist, so that the performers' may be oriented with the position of the instruments. (Figure 3B.4).

CHAPTER 3, PART B, FIGURE 4



Nevertheless, some instruments are placed in positions outside of the family areas according to certain sound combinations during the work to make execution more practical.

The following excerpt from 'Circles' exemplifies the relationship between physical and aural gesture in terms of the movements of the first percussionist around the instruments. (Figures 3B.5 and 3B.6).

Figure 3B.5 illustrates a musical gesture on skin instruments moving from low to high.

CHAPTER 3, PART B, FIGURE 5

Page 9 of score : PERCUSSION I.

(hard sticks)

2 small bongos
2 large bongos
3 tom-toms
timpani

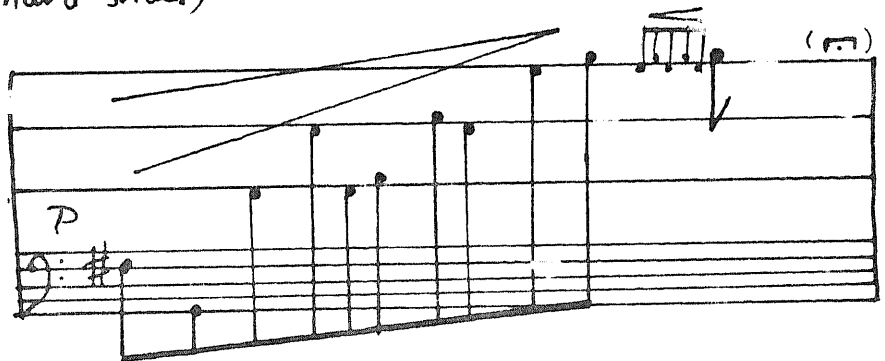
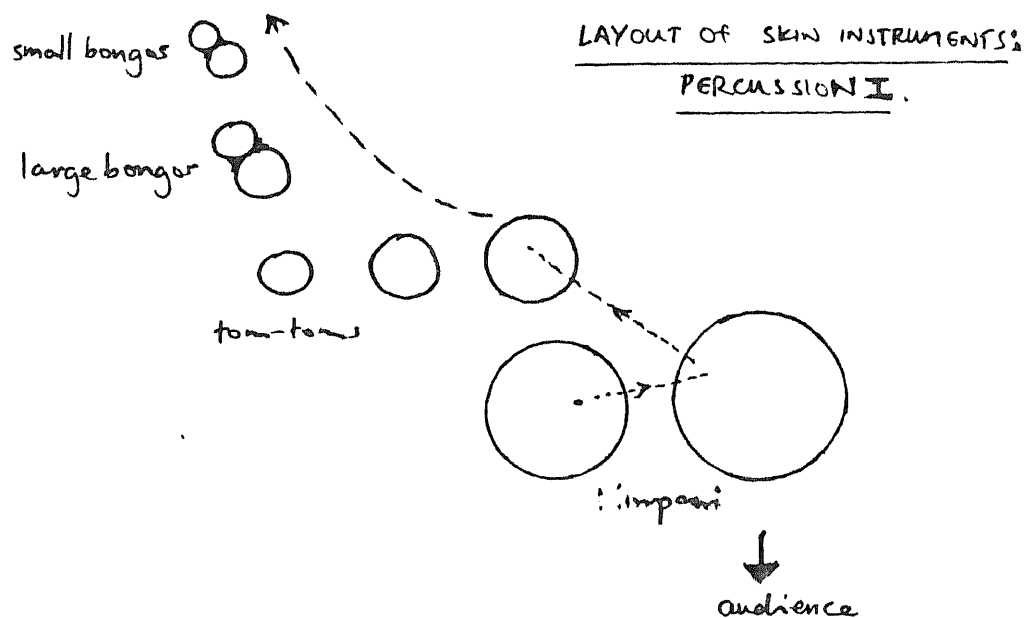


Figure 3B.6 shows Berio's layout of these instruments. Consequently the player moves in a general direction from his left to his right across the drums.

CHAPTER 3, PART B, FIGURE 6



The gestural activity of the percussionists, musical and visual, becomes more complex as the piece progresses.

Berio has said:

'The work itself is considered as a structure of actions which also determine the "theatrical" aspects of the performance'. (47)

This exploitation of the visual movements of the percussionists in 'Circles' could be said to be foreshadowed in 'Tempi Concertati' (1958), which also involved spatial distribution of the players. Both works, in fact, may be seen as major parts of Berio's development, illustrating relationships between visual and aural effects which became features of his style.

Bernard Rands comments on 'Tempi Concertati':

'More than any of his previous works, "Tempi Concertati" explores the nature and function of gesture - physical, dramatic and purely musical'. (48)

'Circles' like 'Tempi Concertati' is thus a piece of music theatre - an audio-visual work - characteristic of Berio's concern for extending the expressive possibilities of musical sound in relation to the visual activity of the musician.



Associated with this concern is his interest in building-up and developing the vocabulary of New Music. For Berio, music is a broad and universal means of communication, where the vocabulary has to be constantly added to and widened by including any types of sounds and structural designs. Rands observed in 1971:

'For the past two decades his prime concern and characteristic as a composer has been his consistent and systematic development of a musical "language", enlarging its vocabulary'. (49)

Berio's musical style could thus be said to be one of constant change and development, creating new conditions and values with each work. Nevertheless, he may be seen to be directly involved in musical trends that arose in the fifties in Europe which sought to establish a new vocabulary of music through various systems and processes.

Like Boulez and Stockhausen, Berio employed serial methods of composition at this time. Through the new approaches to serialism, Berio discovered that with the serialisation of all or most of the parameters of sound, any sound event could be used and organised in a musical work. Composers were no longer reliant on pitches and intervallic characters as the main constructional devices. Looking back, Berio stated in conversation with Simon Emmerson in 1976:

'For me, one of the most important aspects of serial technique was that through a very general and abstract principle one could approach and bring together many different types of materials, even those not usually considered "musical"'. (50)

Consequently, it could be said that even in his serial works, Berio had shown a marked concern for the musical material, recognising the possibility of using any sound for musically expressive purposes. In fact, the choice of materials for each work throughout Berio's development may be seen to determine each particular work's structure, such that new formal designs were derived from new musical sound material.

Berio comments:

'... the chosen material and the form become as one ... which imply the possibility of inventing each time a structural scheme according to the nature of the chosen material - and this gives the composers the possibility and the need of exploring new fields of sound-production'. (51)

This search for new sounds and structures is revealed in Berio's instrumental and vocal music, but his adventure into the electronic medium may also be seen as an important source of new possibilities. These fields of music production are in fact inter-related in Berio's development, exerting mutual influence on each other as a means of extending his range of expression.

The effects of electronic music advances could thus be said to combine with Berio's inherent interest in theatre in creating new directions in his instrumental music from the late fifties. Works like 'Allelujah II', for five groups (1955-7), 'Tempi Concertati' (1958) and 'Circles' (1960), which exploit spatial direction of sounds, are in fact contemporary with Berio's major electronic works: 'Omaggio a Joyce' (1958), 'Visage' (1961) and 'Différences' (1959) (the last combining live sounds with a prepared tape).

His instrumental music composed from this time also may be seen to involve elements of performer choice. These pieces laid new emphasis on the role of the performer as someone more than an interpreter, rather a collaborator. 'Circles', 'Tempi Concertati' and 'Epifanie' are examples, which coincided with the composition of the electronic works mentioned above. Thus, aleatoric notational methods could be said to be introduced into Berio's instrumental compositions as a result of musical precision being explored to its fullest extent in electronic music.

Bernard Rands describes the effect of the electronic medium on Berio's instrumental music:

'He has never regarded electronic music as an extension of instrumental possibility nor as a phenomenon totally divorced from instrumental considerations. For him, electronic music is important precisely because it spotlighted new directions for instrumental development and offered the opportunity to place conventional instruments in a new musical context'. (52)

ALBOURN

This relationship is clearly illustrated in 'Différences'. A prepared tape is derived from the sounds of the five instruments involved (flute, clarinet, viola, cello and harp), and the tape combines with the five players during performance, acting as a contrast and influencing the extension of 'live' instrumental sounds. At the beginning of 'Différences', the 'live' or familiar instrumental sounds are predominant, and the tape is closely related to these sounds. However, as the piece progresses, the tape sounds become more unlike the known instrumental sounds and the 'live' sounds are gradually drawn away from their traditional sound characters. The instrumental and electronic material interact, and, as the taped sounds transform, the instrumental sounds approach the character of electronic sounds. It may be seen that as the taped sounds become more noise-like and pitchless, the non-pitched sound qualities of the instruments are exploited.

ALBOURN

Similarly, in 'Circles', transformations occur from the pitched to the non-pitched qualities of the voice, harp and percussion. With the gradual increased activity of the percussion, contacts are established between the mediums such that the voice and harp become more percussive in character while at the same time the percussion approaches the vocal sounds.

In both works, Berio could be said to be investigating the relationship between different sound mediums to create an intertwining flow of actions. Transformation processes occur through the works so that sound materials change and assume different characteristics according to the surrounding circumstances.

Rands writes of Berio's music:

'He is fascinated with the possibility that this is also that - or could become that given a slight change in attitude or context.

Transformation is at the root of his musical processes'. (53)

LIBRARY
BOURNE

Theatrical or operatic characters may change in the course of a stage work, influenced by other characters, events and conditions. Similarly, a particular sound medium may undergo transformation through an instrumental work as a result of contact with other sound materials, or the influence of certain situations.

The processes of transformation in 'Circles' involve contacts and contrasts between the voice, harp and percussion sound sources. A discussion of this work in more detail later will illustrate this concept in Berio's music and the voice-instrument relations.

"CIRCLES" AND THE VOICE:

The human voice has always interested Berio, investigating its possibilities allied to the sound of words and the spoken language as a source of musical material. Berio's fascination with all facets of vocal sound production - spoken, sung and its whole range of sound possibilities - is evident in the range of works featuring the voice throughout his musical development.

ALBURN

In 'Circles', Berio's manipulation of e.e. cummings' prose, and the sound events derived from it, forms the basis of the work's musical structure and transformation processes. The vocal text becomes a source of musical and non-musical sounds. In fact, the original cummings' prose is itself broken up in some sections into fragments of language and may be seen to be treated by Berio as a collection of sounds and syllables.

Rands states:

'The poetry of e.e. cummings... is resolutely engaged in the pursuit of a poetic based on the "material" of the verbal form in poetry, stemming from a manipulation of the core, the very essence, the linguistic components of the written and spoken word'. (54)

Berio's choice of the three cummings' poems - 'stinging', 'riverly is a flower' and 'n(o)W' - thus gave him the opportunity to extract the musical and sound potential of each word, syllable and vocalisation. Connections are formed between spoken and sung words and syllables, and, using these together, the range of vocal possibilities may be seen to be extended.

Henri Pousseur observes:

'The imperceptable transition from spoken to sung elements, syllabic and vocalised, produced a primary, close connection between music and speech. Both elements no longer appear to be placed one above the other on two separate levels, but are on the same very complex level and can stand in the closest reciprocal relationship to each other'. (55)

Through this extended vocal range as musical material in 'Circles' Berio is able to create parallels between the voice and instruments, developed in close relation to the cummings' text. Paul Griffiths explains:

'In "Circles," he demonstrated how sung tone can merge into and imitate the sounds of the instruments, producing musical equivalents for the word music and syntactic disintegration in e.e. cummings' poetry'. (56)

As in other works of Berio involving the voice, the setting of the text in 'Circles' extends beyond a mere underlining of the literal meaning of the words. The harp and percussion sounds are bound up with the vocal sound language. They both contrast, relate and interact with the vocal activity in various ways, being influenced by the vocal material but also in turn affecting it.

Berio explains:

'It is not a question in "Circles" of a series of vocal fragments with instrumental accompaniment, but rather of an elaboration of the three poems in a unified form where vocal and instrumental action strictly condition each other'. (57)

In fact, the types of vocal expressions that Berio has explored and developed as musical sound sources could be said to have a direct bearing on the understanding of his use of instrumental colours - whether in works with voice or in his instrumental music. 'Circles', for example, shows how Berio's treatment of the voice affects the percussion material and the types of timbres chosen. The choice of percussion in this work in fact may be seen as a logical and inevitable decision in the light of Berio's approach to the musical potential of the human voice and spoken language.

LIBRARY

VOICE AND PERCUSSION:

Western European instrumental music development could be said to have always taken the voice as a point of departure. Melody lines, themes and gestures for instruments (at least up to 1945) were derived from 'breathing' - phrase shaping according to vocal technique. Moreover, just as traditional singing is built on 'vowel' sounds or vocalisation of pitched material, so music for instruments which relies on pitch structure may be said to be based on 'vowel' sounds.

In 'Die Riehe' in 1958, Stockhausen explained that music up to 1945 had been 'pitch-music'.⁽⁵⁸⁾ Its construction was based on a manipulation of 'vowel' sounds - sounds with harmonic-partial relationships.⁽⁵⁹⁾

After 1945, the use of indefinitely pitched sounds as musical material became established in the mainstream of music. Composers such as Berio have expanded the vocal palette beyond the sung tone and pitched sounds as viable material, thus the new instrumental resources may still be associated with vocal expression.

Henri Pousseur describes the contact between vocal and instrumental mediums, which remains even with the introduction of new sound sources:

'Musical instruments - like all other instruments - were originally intended as "extensions" of human members and organs, in our case the human voice and its modulating throat. Many of these instruments, above all the percussion, plucked strings, and, to a lesser degree, bowed instruments, have loosened ties in order to suit the demands of the performing hand, whereby the ear, which cannot be deceived, maintains even with the most modern sound producers the constant contact with the phonetic apparatus'. (60)

The way Stockhausen in 'Lie Reihe 5' related the characteristics of new musical material to vocal sounds, could be said to support Pousseur's observation. He equated pitched tones with 'vowels', and noise with consonants:

'Noises have seldom been employed in occidental music, and most musicians consider such consonant-like sounds to be musically inferior material'. (61)

In reference to electronic music, he compared 'white noise' (the densest sound phenomenon, consisting of all frequencies of the sound spectrum) with the 'sound of the sea'.⁽⁶²⁾ By using filters on 'white-noise', one could obtain different shades of noise structures, called 'coloured noise'.⁽⁶³⁾ He explained this in vocal terms:

'Consonants such as "sh", "f",
"s", "th" etc. constitute such
noise spectra'. (64)

Just as Stockhausen used vocal sounds to describe the new sound phenomena of electronic music, Berio demonstrates in his vocal music, from the late fifties onwards, how the entire range of vocal sounds, including those not traditionally thought of as musical, may be used for musically expressive purposes. Berio has said:

'I am interested in those aspects of sound that are too often disregarded as non-musical, that is, the richness of the human voice - the speaking voice. It is important to integrate this aspect of sound into the musical structure as it once was, the singing voice'. (65)

Spoken language includes consonants on equal
el to vowels as an important part of its
ression. In combination, these form a language
communication. Each sound type is related to
other by a vocabulary and grammar which results
the language's meaningful sense.

Berio saw the musical potential in the sound
es used in spoken language, and, in fact, all
es of vocal expression, such that in his vocal
ts, the consonants are just as active as the vowels
shaping the musical structure. Consequently, the
sonants do not merely serve as articulation of
vowel sounds as in traditional vocal music, but
integral to the construction.

Similarly, indefinitely pitched sounds and noise
ctures may be seen to exist as important parts
is instrumental sound world also: cluster chords,
iphonics for winds, percussion and electronic
ds.

As it was observed earlier, instruments in the past were created and developed to extend the range of expression using pitched tones, stemming from the singing voice on vowel sounds. Berio could thus be said to continue in the path of tradition, associating instrumental sounds with vocal phenomena. Here, the new instrumental usages relate to the new musical approaches to the voice. By extending vocal possibilities in music to include consonants - and other vocal sounds not thought of as musical before - the use of percussion as an extension of vocal sound may be seen to be established. This is clearly illustrated in 'Circles' .

Indeed, the association may be regarded as a natural consequence and inevitable development, contributing to the importance of percussion as a relevant musical sound source. Vocal sounds such as 'd', 'rrr...', 'sh', 't' could be said to have the following percussion sounds as their instrumental equivalents, i.e.:

- a stroke on a low drum ('d')
- a guiro rasp, or wood block roll ('rrr...')
- a suspended cymbal roll or maracas ('sh...')
- a castanet, clave or wood block stroke ('t').

In 'Circles', the relation between the percussion colours and vocal sounds is clarified in this context. Berio creates links between new sounds and gestures of percussion, and their vocal equivalents, so one medium may lead to and imitate the other.

Richard Goldman observed an aspect of the voice-percussion connection in his review of a performance of 'Circles':

'The words are wrenched apart... or banged together; the rhythms and intervals of the vocal line hit the consonants as violently as possible, so that the voice becomes part of the apparatus of tuneful percussion'. (66)

Consequently, the pitched percussion, and indefinitely pitched sounds mentioned earlier, may be seen to acquire structural importance.

In music before the Second War, percussion sounds were used as punctuation, reinforcement or rhythmic support as an underlying colour. Although these types of functions exist in 'Circles', the role of the percussion is extended, to become actively involved in the structure and draw attention to the vocal consonants at key points through the work. Contacts thus established represent a vital part of the transformation processes and development of material.

"CIRCLES" - STRUCTURE AND NOTATION:

'Circles' is divided into five sections. Berio arranges the three cummings' poems in arch-like sequence: I (poem 1) - II (poem 2) - III (poem 3) - IV (poem 2) - V (poem 1). The music of the outside sections may be seen to be related and also the second and fourth. However, the sections run into one another, forming a gradual development through the work, and each carries on from where the previous one left off according to the musical treatment of the poems. There is increasing contact between instrumental and vocal material towards the main climax of the work, and consolidation of the merger in the final sections. The whole piece could be said to revolve about the long central section based on the third poem.

George Flynn summarises the musical action derived from Berio's treatment of the text:

'... in its first three parts, sung language gradually disintegrates into spoken phones while musical sounds evolve from pitches to ever more assertive gestural and percussive noise, then, during its last two parts, words, singing and pitches are progressively reconstituted'. (67)

The progressive break-up of the vocal line, from singing, to 'sprechstimme', to various types of vocal expressions in the central section, is echoed in the harp and percussion parts, which become more active and assertive with more varied colours and figures.

As a consequence of the vocal development in the opening sections, transformation of colour may be seen in the percussion. The percussion instruments are introduced one family at a time in the first two sections, in a gradual move from dry, noise-like wood sounds, to skin sounds, to resonant, pitched metal colours at the end of the second poem. This could be said to act not only as an exposition of material but also at the same time represent a development towards the central part.

I: "STINGING"

At the end of the first section, from where the vocalist leaves off on the word 'dreams', a transformation occurs in the percussion from noise-like to pitched wood sounds. Taking the vocalist's 's' of 'dreams' as a point of departure, the matching percussion colours are sand-blocks and maracas which grow imperceptibly from the vocal sound. Mexican beans later contribute rhythmic colour to the texture. (Figure 3B.7).

CHAPTER 3, PART B, FIGURE 7

Page 7 of score

noise-like percussion sounds →

2 4

3 4

2 4

sand blocks

mexican beans

wood block

claves

singer conducts

dream

maracas

temple blocks

Consequently, the introduction of the wood-blocks, temple-blocks and log drum - the vocalist playing claves - adds definition to the percussion material with approximately pitched, graduated timbres and rhythmic attacks. Transformation to wood sounds of precise pitch is complete when the marimba and xylophone enter. (Figure 3B.8).

CHAPTER 3, PART B, FIGURE 8

wood blocks
maracas
Log drum

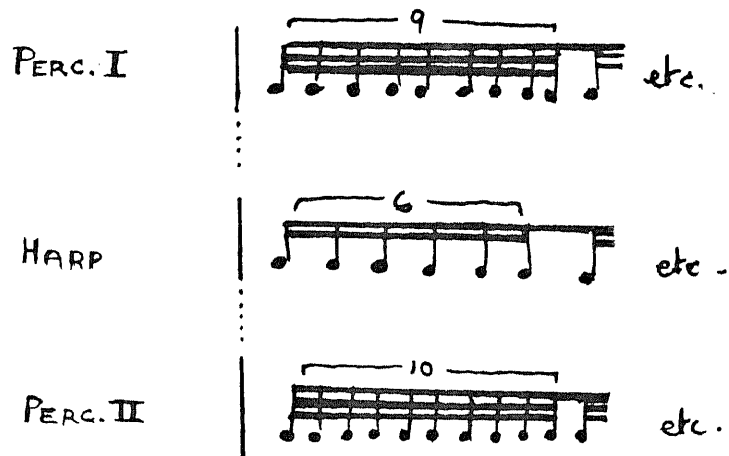
Page 8 of 30

→ approximate pitched sounds — — — — — → precise pitch — — — — — → noise-like cluster.

temple block
maracas

However, the explosion on wood keyboard instruments and harp assumes a noise-like cluster effect through the combination of opposing rhythmic groupings and pitches. (Figure 3B.9).

CHAPTER 3, PART B, FIGURE 9



Although movement from noise structure, to graduated sounds, to precise pitches has occurred, a circle may be seen to be formed with the pitched material approaching noise character. Berio shows in this passage how pitched sounds may be related and used together with non-pitched sound through a simple process of transformation.

In a short space of time these pages could be said to illustrate Berio's musical outlook based on the idea which Rands pointed out earlier:

'... that "this" is also "that" - or could become that given a slight change in attitude or context'. (68)

In fact, from the very beginning, Berio explores the connection between different sound materials, in the relation of the voice to the harp.

The melismatic vocal line and harp gestures are matched in dialogue. The singer's attack on the consonants and the use of open (o) and closed (+) mouth are equated with the harp's characteristic sharp attacks and the following decay. (Figure 3B.10).

CHAPTER 3, PART B, FIGURE 10

° + ° → +
st in — ging
≧ ≧

The articulation of 'stinging' therefore assumes the quality of the plucked 'twang' on the harp strings. Consequently, the harp could be said to act as a mediator between vocal and percussion sound phenomena, being exploited for its percussive attack qualities and pitched resonance, and thus making contact with both mediums.

In Berio's treatment of 'riverly is a flower' these contacts become more prominent as the vocal part becomes more syllabic and varied in articulation.

II- 'RIVERLY IS A FLOWER'

Skin instruments are introduced at the beginning of the second section. After the explosion immediately before, the shape of the gesture on drums appears as an answer or echo of the preceeding figure. It thus may be seen as a link between the two sections. (Figure 3B.11).

CHAPTER 3, PART B, FIGURE 11

wood blocks
log drum

voice more varied in articulation;
approximate pitch
on the breath

very is a fly
wer gone so fly by lamb

Temple blocks

II

wood blocks
log drum
voice
Temple blocks
voice

These gestures are written in spatial notation, the players interpreting the rhythmic shape according to the relative spacing of the notes. The purpose behind this notation may be seen to be influenced by the following action, where the vocal line becomes more broken-up and the music becomes progressively freer. Throughout this second section the vocalist's part is metred, but harp and percussion are coordinated in proportion to the vocal line.

The tremolando figures on the instruments are written in this proportional notation, echoing the rolling 'r' sounds of the opening words: 'riverly is a flowerl'. The main percussion sounds here are pitched wood instruments (xylophone and marimba). However, their ranges are extended by the addition of indefinitely pitched wood sounds: three wood blocks and five temple blocks extend the upper range of the marimba and xylophone respectively, while the two pitches of the log drum extend the lower part of the marimba. (See Figure 3B.11).

The character of the predominating timbres of the first two sections - wood and skin - may be seen to overlap. In fact, the increased activity of the skin instruments throughout section two could be said to develop from wood sounds. Both wood and certain skin instruments possess short, dry sound characteristics, which Berio exploits. This relationship is underlined on pages 9-10 of the score, where pitched and indefinitely pitched wood sounds are fused with skin sound colours. (Figure 3B.12).

CHAPTER 3, PART B, FIGURE 12

The image shows two staves of handwritten musical notation for percussion.
Staff I is labeled 'Perc. I' and includes the following instruments: wood blocks, log drums, and marimba. It features a 4/4 time signature and a key signature of one flat. The notation includes various rhythmic patterns, including a triplet marked '(2)' and a measure with a '3' over it.
Staff II is labeled 'Perc. II' and includes the following instruments: 2 bongos, 3 tom-toms, 2 congas, and bass drum (foot pedal). It also features a 4/4 time signature and a key signature of one flat. The notation includes various rhythmic patterns, including a triplet marked '(2)' and a measure with a '3' over it.
A vertical line connects the two staves, indicating a relationship or synchronization between the two parts.

The gradual break-up of the vocal line into separate syllables is in fact underlined by skin instruments through the section. This is illustrated in Figure 3B.13, where the bongos match the voice, exhibiting similarity in the melodic shapes.

CHAPTER 3, PART B, FIGURE 13

The image shows a handwritten musical score on two staves. The top staff is labeled 'skins' and contains two parts: '2 high bongo' and '2 low bongo'. The bottom staff is labeled 'Perc. I'. The vocal line is written on a staff with lyrics: 'ro. si ly gods whi. ten befall saith rain'. A box labeled 'Page 10 of score' is placed to the left of the vocal staff. Vertical dashed lines connect the vocal notes to the bongo notes, showing melodic similarity. The bongo notes are marked with 'mf' (mezzo-forte).

A climax is reached on 'morte'. The vocalist emphasises each sound of the word, a tambourine and wood block roll emerging from the vocal 'r' sound. (Figure 3B.14).

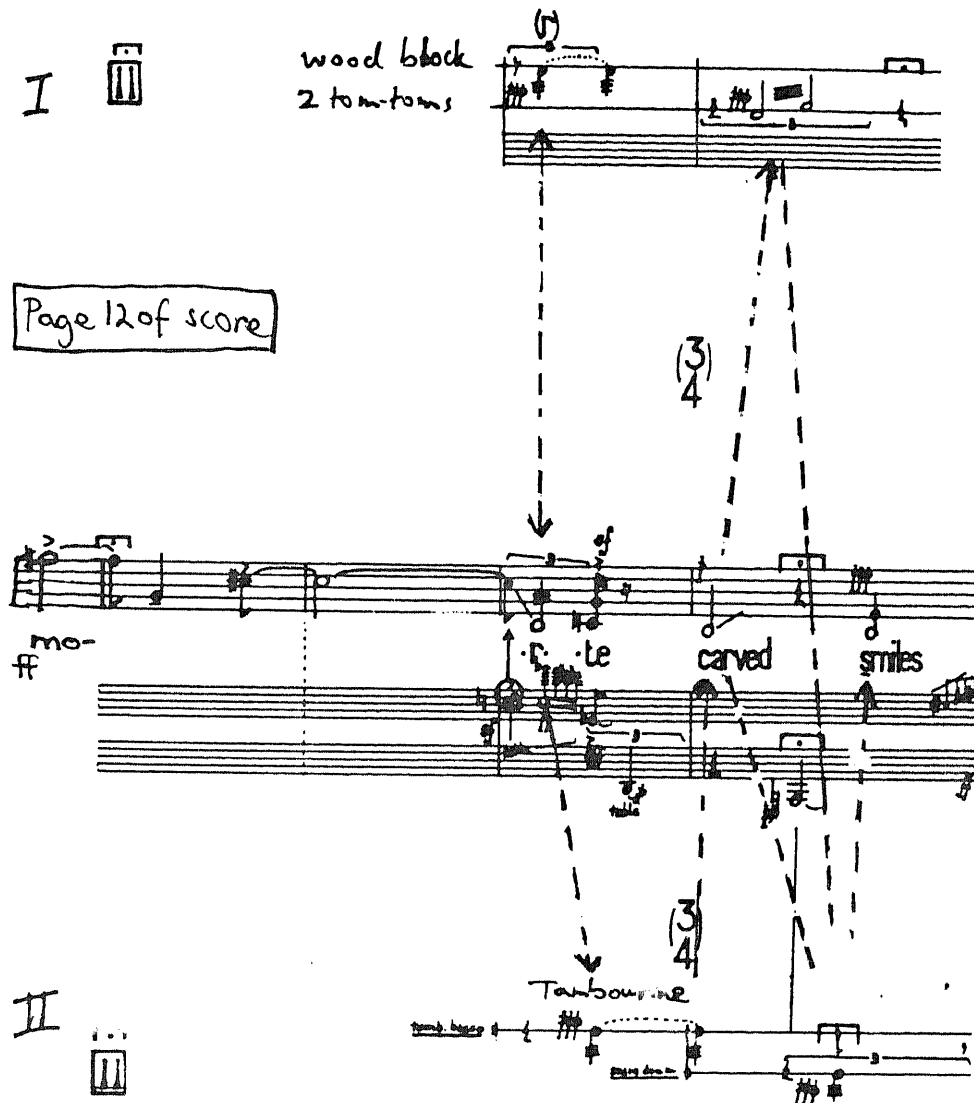
CHAPTER 3, PART B, FIGURE 14

I  wood block
2 tom-toms

Page 12 of score

mo-
te carved smiles

II  Tambourine



The word 'carved' in the above example gives rise to a tremolo on two tom-toms and a snare drum, which in turn lead to the vocalist's 'smiles'. A continuous sound between voice and percussion may thus seem to be established, with one event leading to the other, exemplifying Rands reference to 'Circles' as a 'network of actions'.⁽⁶⁹⁾

Later, tambourine and snare-drum rolls may be seen to be derived from the 's' sounds in 'sly slim gods stare'. These particular skin colours, which stem from the vocal activity lead to the introduction of metal instruments. (Figure 3B.15).

CHAPTER 3, PART B, FIGURE 15

The image displays a handwritten musical score on a grid of staves. The score is oriented vertically, with the vocal line on the left and instrumental parts on the right. The vocal line includes the lyrics: 'sly slim gods', 'stare', and 'sly slim gods'. The instrumental parts include 'Snare drum' and 'Tambourine'. The score is annotated with various musical symbols, including notes, rests, and dynamic markings. A box in the lower left corner contains the text 'Page 14 of score'. Arrows indicate the flow of the music and the relationship between the vocal and instrumental parts.

Page 14 of score

sly slim gods

stare

Snare drum

Tambourine

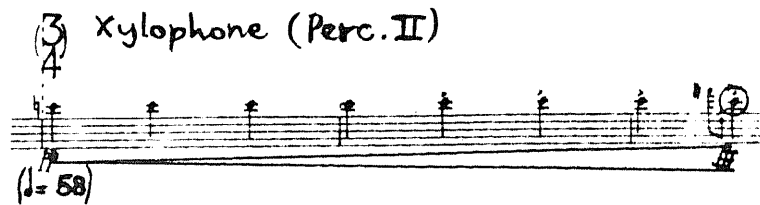
The snare drum roll in the above example merges with a suspended cymbal roll. Thus the change may be seen to be gradual, from wood and skin sounds, through skin instruments with metallic character (tambourine jingles, snares), to all metal timbres.

As the metallic colours become more prominent, their long sounding character is matched by rolls on various skin instruments. Metal and skin timbres thus connect and overlap just as skin and wood earlier.

In fact, the metal colours are introduced moving from instruments with noise-like character to ones with precise pitches, similar to the way wood colours were introduced on page 7 and 8 of the score. The pitchless metallic sound of the suspended cymbals lead to the graduated sounds of three triangles and tam-tam, which then lead to precisely pitched sounds of glockenspiel and celesta, closing the second section.

A repeated motive appears here which could be said to prelude the entry of the pitched metal sounds. (Figure 3B.16).

CHAPTER 3, PART B, FIGURE 16



(This motive will be seen to become more important as the work progresses, culminating in section five).

All the metal instruments combine on page 16 of the score in the presentation of 'sly slim gods stare'. (Figure 3B.17).

CHAPTER 3, PART B, FIGURE 17

Page 16 of score

triangles
hi-hat
cymbals
for horns

slam

slim

sky slim

gods

stare

triangles
cymb.
turn-ton

slam

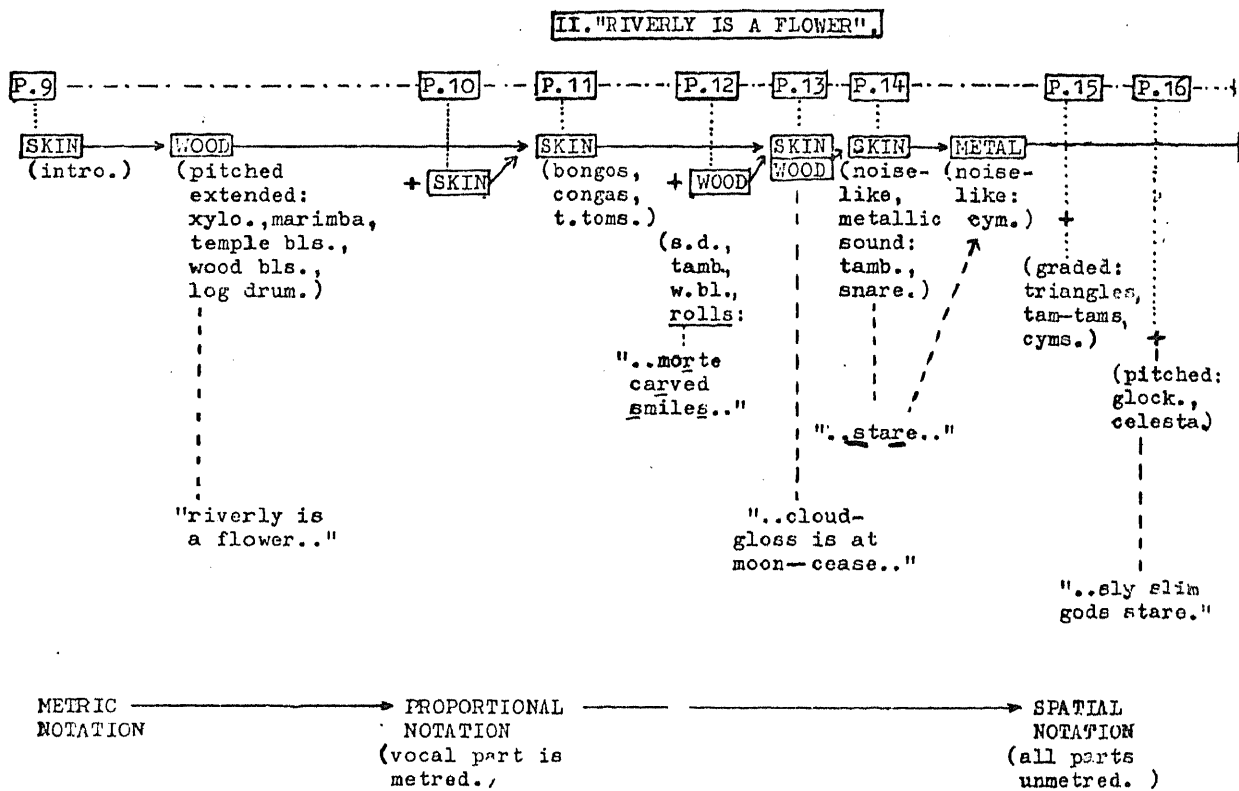
The previous appearance of this phase on page 14 of the score was dominated by short dry wood sounds, with pitch approximations and spoken sounds in the voice (see Figure 3B.15). Although the repeat of the words show a similar melodic contour, the articulation of the phrase is now dominated by the resonant metallic atmosphere. (Figure 3B.18).

CHAPTER 3, PART B, FIGURE 18

[illegible]

In Figure 3B.17 it may be seen that the bell-like sonorities are allowed to occur freely in time. Coordination between the parts is spatial, according to the placement of the notes on the page, with the vocalist supplying certain cues on the finger cymbals. There is no reference to metre as in the preceeding pages, which could be said to be due to the transformation of the vocal material and related instrumental sonorities. This gradual change in section two as reflected in the percussion sounds is illustrated in Figure 3B.19.

CHAPTER 3, PART B, FIGURE 19



Consequently, the spatially notated musical design at the end of section two may be seen to act as an introduction to the improvisatory third section, where all players are equally active in controlling the musical flow, and words and instrumental gestures become even more closely linked.

III: "N(o)W"

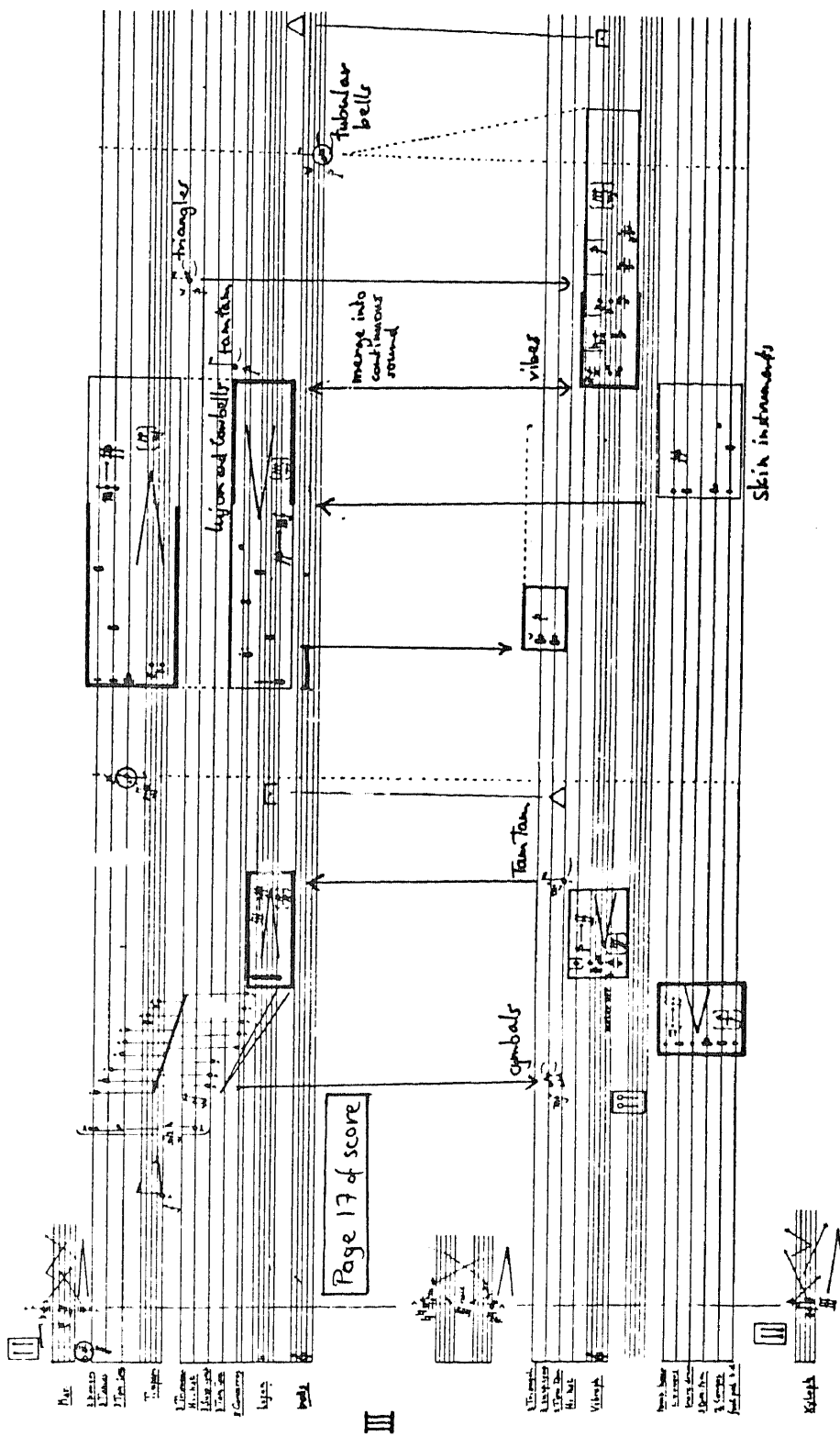
In the central part of 'Circles', all wood, skin and metal are involved in a complex interplay with the vocal sounds derived from cummings' poem 'n(o)w'. Here the voice acts like one of the instruments, uttering disjunct syllables and emphasising the letter sounds of the text. Misha Donat writes:

'Throughout the first half of the work the word-setting becomes progressively more disjointed until at the climax of the work, which occurs towards the end of the third section, the text becomes a series of meaningless exclamations designed to stimulate the improvisation of the percussionist'. (70)

The vocalist's sonic or visual gestures, or both combined, trigger of certain entries of the instrumentalists, so that the spatially coordinated parts may indicate visual as well as aural links. However, conversely, certain cues are also made by the harp and percussion which set-off the vocalist.

Serocki's 'Continuum', for six percussionists (1965), could be said to be similarly conceived, the players giving each other visual and aural signals to connect certain events. As in 'Continuum', the third section of 'Circles' may be seen as a series of actions or sound events which lead on from one another, resulting in a musical flow. Like Serocki, Berio allows performer freedom in terms of durations and attack times. This is illustrated in the opening of section three for the two percussionists alone. (Figure 3B.20).

CHAPTER 3, PART B, FIGURE 20



The example shows how changes in one part signal entries in the other, duration being up to the players according to the horizontal distances on the page. By inserting vertical arrows the cues between the players may be made clearer.

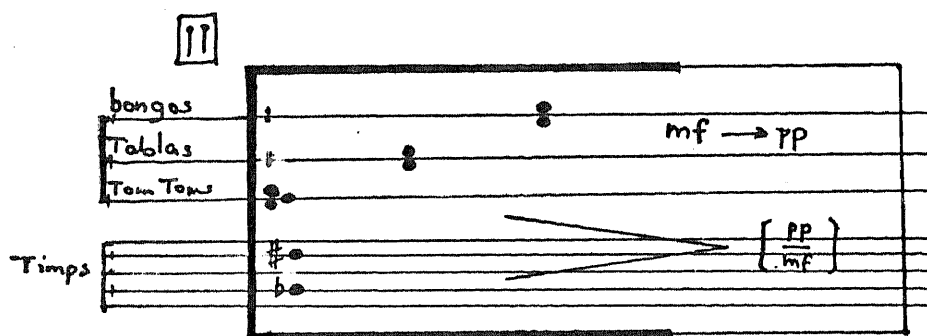
A feature of the percussion parts throughout this section is Berio's indication of gestures by means of boxes, illustrated in Figure 3B.20 above. In these 'improvisation boxes', Berio has allowed freedom as to the details of the ordering of sounds within a general time space. The duration of the activity is interpreted by the performer according to the length of the box on the page, and relative to events in other parts.

Berio explains the concept behind these boxes:

'... the instrumental parts are occasionally not completely defined in conventional musical notation, but the general nature of the action is indicated. The specific result depends somewhat on the personal characteristics of each performer'. (71)

Although Berio is allowing certain freedoms for the performers he is nevertheless indicating the character of a particular gesture. In the boxes, Berio defines the tone colours, the general intensity and density, and in some cases the types of sticks to be used. Only the order and combination of the notes within the box are left to the performer's choice. (Figure 3B.21).

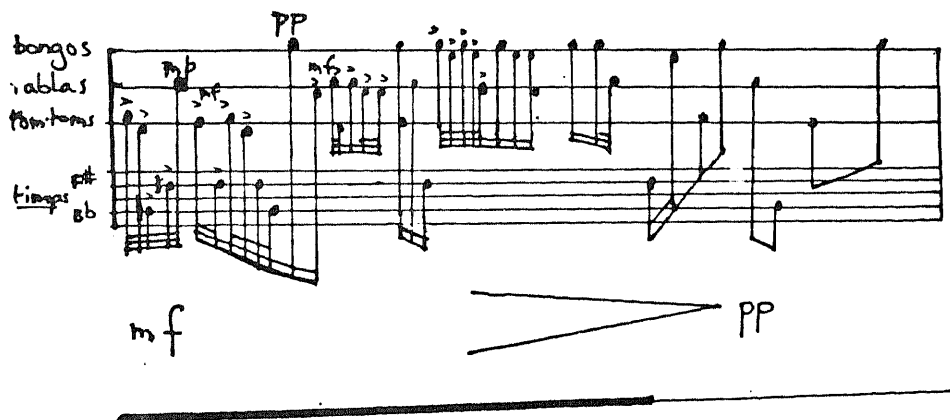
CHAPTER 3, PART B, FIGURE 21



The thickness of the box's outline indicates the density of the activity. Change of density, according to the thickness of the horizontal length, is proportionate to the whole length of the box. Intensity is specified conventionally ($mf > p$) which, in the above example, may be seen to correspond to a change from high to low density. A range of dynamics within the main intensity is signified by $\left[\frac{pp}{mf} \right]$. The performer may freely use degrees within this range. The larger notes signify the instruments which are to predominate at the proportionate time within the box.

Fully written out in a more exact notation, a possible interpretation could be as shown in Figure 3B.22.

CHAPTER 3, PART B, FIGURE 22



The above example may be seen to be only one possible performance, but a different execution could be said to result in a gesture with a similar general shape. Although details may be different from performance to performance, the quality is defined by the composer. This indication of general qualities rather than precise values may be seen to be derived from new attitudes towards the performer and new accompanying structural ideas.

Berio has written:

'Open form has sometimes rendered new concepts of notation which would no longer be based exclusively on quantities but rather on qualities, not only on notes but also actions'. (72)

Comparison between Figures 3B.21 and 3B.22 suggests a purpose behind Berio's box notation of qualities, in that it shows how a complex passage may be notated by simpler means and still express the composer's intention.

Similar procedures may be seen in Toru Takemitsu's 'Cassiopeia', for solo percussionist and orchestra (1971), and Hans Werner Henze's theatre piece, 'El Cimarrón' (1969-70), exhibiting the range of application of qualitative notation and the importance of percussion in relation to this concept.

Takemitsu's work was written for Stomu Yamash'ta, and allows the percussionist areas of improvisation within certain boundaries. The orchestral parts are precisely notated to the last detail, and the soloist improvises in response to the orchestral activity.

Like Berio, Takemitsu indicates the instruments to be used within the boxed areas, also specifying the types of sticks. Dynamic ranges are suggested as in Berio's boxes. (Figure 3B.23).

CHAPTER 3, PART B, FIGURE 23

Takemitsu: "CASSIOPEIA"

orch. metre: $\frac{5}{8}$ (two bars after ⑤) $\frac{3}{8}$

solo percussion

steel drum (Y) $\rightarrow$ pp ✓ f

congbells (3) $\rightarrow$ f
p

Gongs (2) $\rightarrow$

TamTams (2) $\rightarrow$

STICKS

X : hard

qX : soft

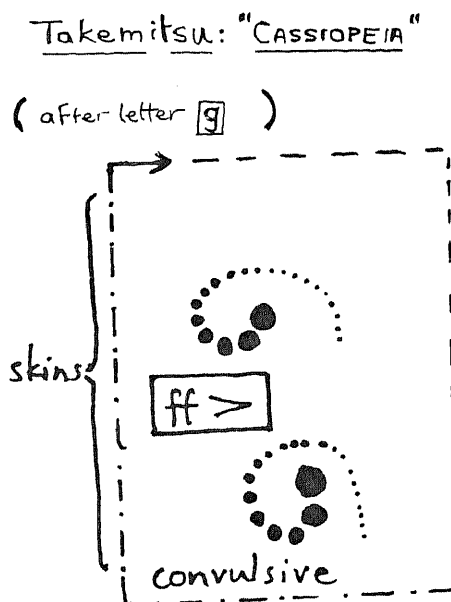
metallic wind chimes. $\rightarrow$ pp

counter improvisation to orchestra

The steel drum is to be played within a dynamic range from 'pp' to 'f', while the other instruments are to be played freely between 'f' and 'p', with the former dynamic predominating.

Later in the work, Takemitsu makes use of graphic notation. A visual design denotes the character of a particular event which is translated into sound by the percussionist. (Figure 3B.24).

CHAPTER 3, PART B, FIGURE 24



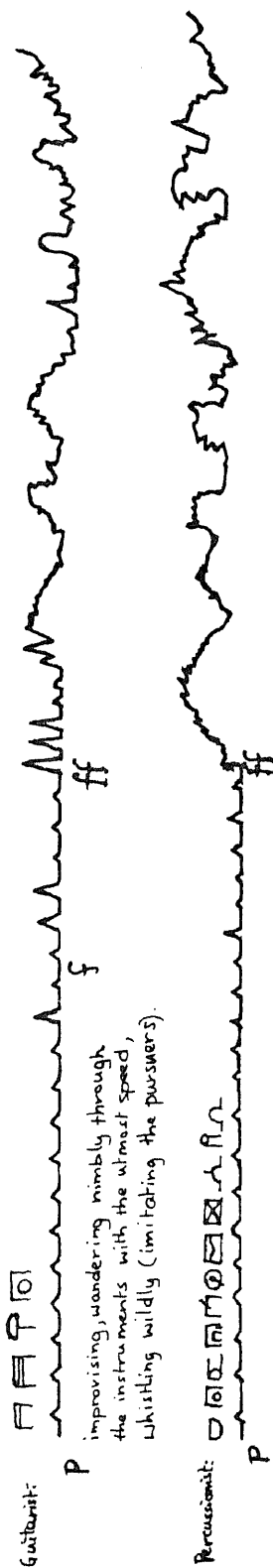
Similar graphics and improvised procedures are found also in Henze's 'El Cimarrón', for baritone, flute, guitar and percussion. In sections of this work, like 'Cassiopeia', there exist varying degrees of freedom left to the players for improvisation. In these areas, writing out the parts exactly and fully would have introduced difficulties, hindering the spontaneous theatrical impact. This is especially pronounced in the percussion part, where the visual effect is just as important as the aural.

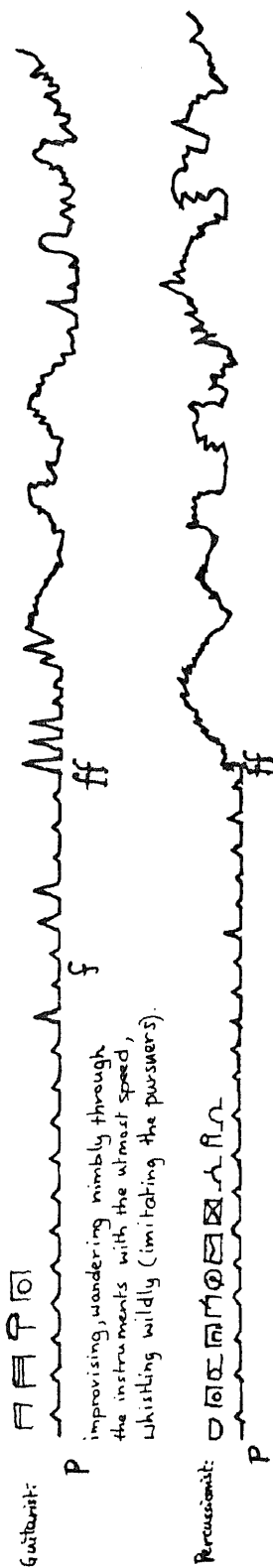
Consequently, Henze notates the percussion with graphic indications for the visual action, and, although he specifies the instruments to be used, the details of execution are left to the player. The overall result of the performance of a particular theatrical effect could therefore be said to be made clear.

This is illustrated in the following excerpt, where the guitarist and percussionist move quickly through various instruments symbolising the pursuers of the escaped slave. (Figure 3B.25).

CHAPTER 3, PART B, FIGURE 25

Henze: "EL CIMARRON" (Page 31 of score)

Guitarist: 

P 

ff

ff

P

ff

improvising, wandering nimbly through the instruments with the utmost speed, whistling wildly (imitating the pursuers).

INSTRUMENTS

- | | | | | | |
|--|----------|--|------------------|--|---------------------------------|
| | tom toms | | temple bells | | thunder sheet |
| | bongos | | conga | | small drum |
| | cowbells | | log drums | | suspended cymbals |
| | tam tam | | bamboo drums | | Trinidad gong drum (steel drum) |
| | | | bass drum (foot) | | crotales |

Instruments to be used are indicated by visual symbols, as in 'Cassiopeia'. General dynamics are specified, with the mode of action and the amount and type of activity suggested by a jagged line.

Both Takemitsu and Henze, like Berio, may thus be seen to be notating qualities, allowing freedoms for the percussionist. In this way they are making him actively involved in the theatrical aspect of the music, stimulating spontaneous actions in performance.

However, the notation procedure may also be regarded as a solution to difficulties in performance facing the percussionist in complex passages, where the important idea is only an overall impression and colour of a group of notes. The precise articulation of specific individual points are therefore insignificant to the concept of the whole effect and what the composer actually wants perceived.

In a section of the percussion part in 'Tempi Concertati', for example, Berio desired a particular explosive gesture, which would have been complex if every detail was notated. He therefore specified that all instruments be struck as fast as possible. Cope explains:

'"Tempi Concertati" requires the percussionist to hit everything as fast as possible; exact notation would be impractical or even impossible. The effect is predictable and effective even without a note or rhythm being written'. (73)

Lukas Foss adds:

'... try to notate this exactly and you force the percussionist to wrestle with the unessential: the "order" in which these instruments are to be hit; the resulting performance will seem studied, whereas the effect in the composer's mind was one of abandonment, of eruption'. (74)

A similar idea is presented in 'Circles', notated in box form. (Figure 3B.26).

CHAPTER 3, PART B, FIGURE 26

The image displays a musical score for two percussion parts, Perc. I and Perc. II, with associated vocal cues. The score is presented on multiple staves. Perc. I is shown with a melodic line and a dynamic marking of *pp* (pianissimo). Perc. II is shown with a similar melodic line and a dynamic marking of *pp*. A central box labeled "vocalist cues." contains a series of vertical lines and arrows, indicating the timing and duration of vocal cues. A dashed line connects the vocal cues to the percussion parts. A box labeled "Page 24 of score" is located below the vocal cues. The score is written on a series of staves, with the percussion parts and vocal cues clearly marked.

Perc. I

vocalist cues.

Page 24 of score

Perc. II

It occurs in a climatic part of the central section, where the vocal gestures may be seen to be increasingly fragmentary and tense, which result in a burst of activity on most of the percussion instruments, at maximum density and intensity. Precise quantitative notation would not have the same visual and aural effect.

Even so, where Berio requires a specific type of action from the percussionist he notates the exact sounds and their order. At these moments Berio indicates specific sound events associated with a movement of the percussionist across certain instruments. This is illustrated on page 18 of the score. (Figure 3B.27).

CHAPTER 3, PART B, FIGURE 27

The image shows a handwritten musical score on a single page, labeled "Page 18 of score" in a box. The score is for a percussion ensemble and includes a voice part. The staves are labeled as follows:

- Perc. I:** This staff has two systems. The first system includes staves for "skins" and "metals". The "skins" staff shows a rapid, ascending sequence of notes, while the "metals" staff shows a few notes. The second system is a boxed-in section with notes on both "skins" and "metals" staves.
- Perc. II:** This staff has a single system with a few notes, including a boxed-in section.
- Skins:** This staff shows a rapid, ascending sequence of notes, with a boxed-in section.
- Metals:** This staff shows a few notes, with a boxed-in section.
- Voice:** This staff shows a few notes, including a boxed-in section.

The score is written in a handwritten style, with various musical notations such as notes, rests, and dynamic markings. The "skins" and "metals" staves are grouped together, and the "Perc. I" and "Perc. II" staves are also grouped together. The "voice" staff is separate. The boxed-in sections indicate specific musical gestures or figures.

Both gestures involve a rapid and vigorous movement by the percussionists from their left to their right across skin instruments, corresponding to a progression from low to high pitch. In Percussion I, the peak of the figure appears in the form of an explosion of sound on skin and metal instruments, expressed in box notation.

A similar type of gesture appears in the climax of the work on page 28 of the score, where precise and approximate indications are combined. (Figure 3B.28).

CHAPTER 3, PART B, FIGURE 28

This is a handwritten musical score for a percussion ensemble, titled "Figure 28 of score". The score is written on multiple staves, with various musical notations and performance instructions. The instruments and parts are labeled as follows:

- SK.**: Snare Drum, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- tom toms**: Tom-tom drums, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- metal**: Metal percussion, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- Perc. I**: Percussion I, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- VOICE**: Vocal part, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- HARP**: Harp, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- Perc. II**: Percussion II, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- skin**: Skin percussion, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.
- xylophone**: Xylophone, with notation including eighth and sixteenth notes, and dynamic markings like *p* and *f*.

Performance instructions and markings include:

- walk**: A instruction to walk, appearing multiple times.
- walk to 2nd stand**: A instruction to walk to the second stand.
- Page 28 of score**: A label indicating the page number.
- dynamic markings**: *p* (piano) and *f* (forte) are used throughout the score.
- musical notation**: The score includes various musical notations, including eighth and sixteenth notes, rests, and dynamic markings.

Here, the visual and sonic activities of the percussionists are closely connected with the vocalist's.

Both parties are involved in a dramatic discourse, where the vocalist presents a gesture ('tktk...') which the percussionists react to, with a similar sound on their instruments. Using wire brushes, the percussionists rapidly play a number of skin instruments in imitation of the vocal sound. The opening of the figure is fully written out, like the previous gesture discussed, and is similarly followed by activity indicated by an improvisation box. A 'decrescendo' in the repetition of the three tom-tom figure appears as a reverberation of the build-up of sound, corresponding to the vocalist's repetition of 'tk' after her initial attack. (Figure 3B.29).

CHAPTER 3, PART B, FIGURE 29

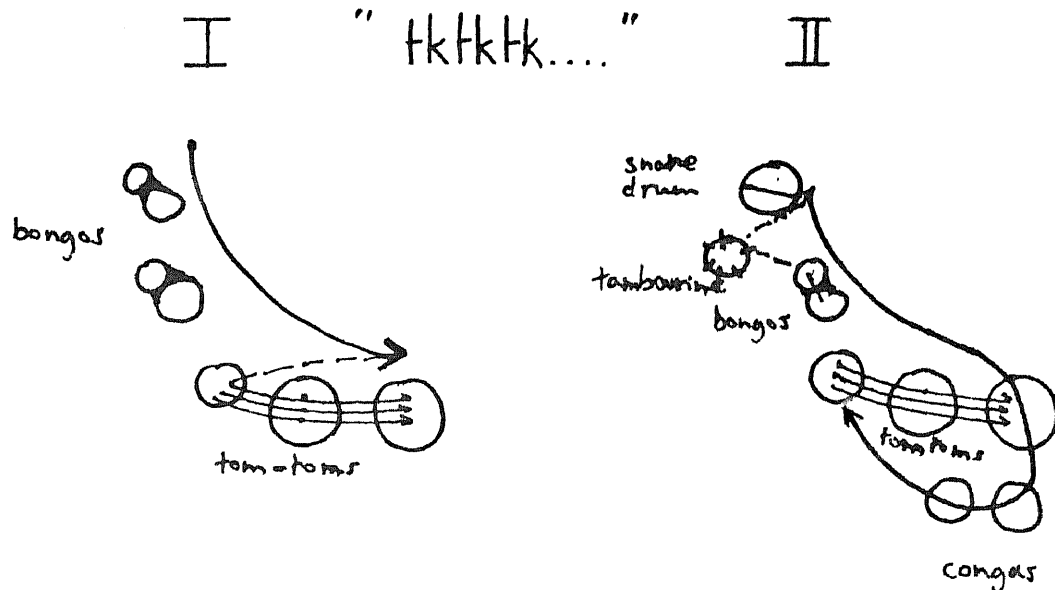
The figure contains three staves of handwritten musical notation:

- Perc.I**: Labeled "tom-toms (wire brushes)". It features a series of notes on a staff with a wedge-shaped decrescendo above it. Below the notes is the handwritten text "tktktktktk".
- Voice**: Labeled "ff" (fortissimo). It features a wedge-shaped decrescendo.
- Perc.II**: Labeled "tom-toms (wire brushes)". It features a series of notes on a staff with a wedge-shaped decrescendo above it.

A visual action also accompanies the percussionist's sound event, which could be said to act as a reply to the vocalist's movement: the turning of the vocalist being imitated in the percussionists' movements across the skin instruments. (Figure 3B.30).

CHAPTER 3, PART B, FIGURE 30

LAYOUT OF PERCUSSION
AND PERCUSSIONISTS'
MOVEMENTS



The percussionists may thus be seen to present the vocal event visually as well as aurally, in a choreographed theatrical exchange between the two mediums.

Just as the vocalist makes contact with percussion instruments, with percussive vocal gestures, so reciprocally, the percussionists later acknowledge the vocal character of their instrumental sounds. Both percussionists utter vocal sounds such as 'ka', 'ku', 'ki', 'ke', simultaneous with the execution of certain chords on marimba and xylophone. (See Figure 3B.28, earlier).

This type of contact leads to a discourse between all players: the vocalist and percussionists clapping wood chimes together while shouting 'ka', and the harp contributing with sharp cluster chords. (Figure 3B.31).

CHAPTER 3, PART B, FIGURE 31

This is a handwritten musical score for a percussion ensemble and voice. The score is organized into five staves, each with a label on the left: **PERC II**, **VOICE**, **HARP**, **PERC I**, and **xylophone**. The **PERC II** staff features a marimba part with notes marked 'ka' and a large, dense, textured block of sound. The **VOICE** staff shows vocal lines with notes marked 'ka' and a 'Sing alone' instruction. The **HARP** staff contains arpeggiated chords. The **PERC I** staff is mostly empty, with some faint markings. The **xylophone** staff has notes marked 'ka' and a large, dense, textured block of sound. A central box labeled 'Page 29 of score' is placed between the **PERC II** and **VOICE** staves. The score includes various musical notations such as notes, rests, and dynamic markings, along with a vertical line on the left side of the staves.

Page 29 of score

marimba

PERC II

VOICE

HARP

PERC I

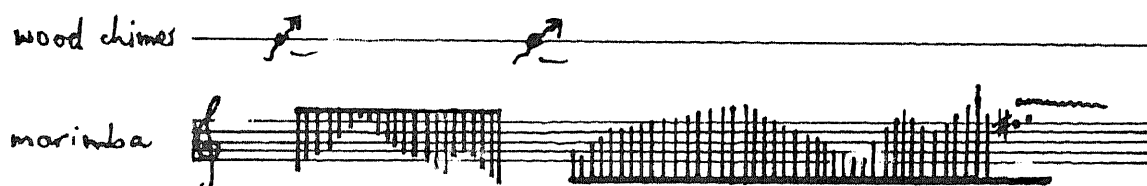
xylophone

The 'ka', appearing as a vocal equivalent of the instrumental sound character of the chimes, could be said to represent a complete merging of voice and percussion. Here the singer and percussionists become identical types of performers, both vocal and instrumental, visually symbolising the contact that has been established between the two sound mediums.

Figures also appear within this episode on marimba and xylophone, characteristic of the gestural activity dominating the third section. (Figure 3B.32).

CHAPTER 3, PART B, FIGURE 32

Percussion I, p. 29 in score.



Pitch details are left to the percussionists according to the shape and density of the figure within an approximate range on the keyboard. This may be seen as another example of Berio's use of controlled indeterminacy in 'Circles', where the exact pitches are secondary to the implied musical gesture.

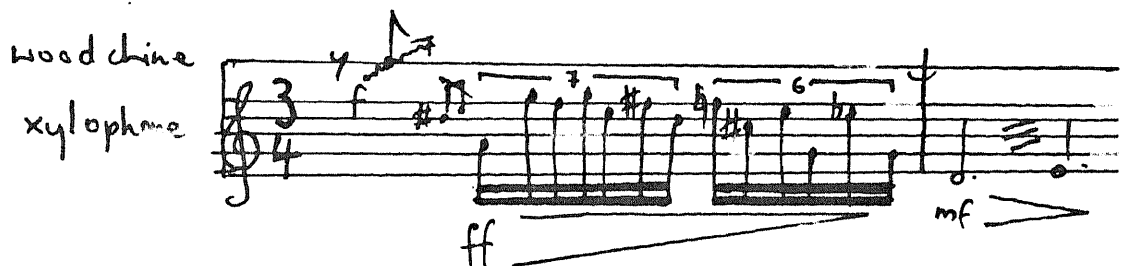
Previous similar figures in the work are notated with precise pitches such as on page 8 (see Figure 3B.8), page 12, and page 14 of the score.

A comparison between these and the above figure reveals how Berio's notation of the instrumental activity is associated with the break-up of the vocal text.

Figure 3B.33, below shows precise pitches notated within metric time.

CHAPTER 3, PART B, FIGURE 33

Percussion II, p.12 of score.



Through section two, as time becomes freer towards the central section, pitches are specified, but are to be played freely within a certain metric time space, as illustrated in Figure 3B.34.

CHAPTER 3, PART B, FIGURE 34

Percussion I, p. 14 of score.

woodchimes mf

marimba ppp

1 2 ppp 1 2

Consequently, in the work's climax near the end of the section three, pitch and time both become free, as shown in Figure 3B.32 earlier.

Berio notates glissandi figures on the keyboard instruments with approximate lines of direction for each hand. (Figure 3B.35).

CHAPTER 3, PART B, FIGURE 35

Percussion II, p. 17 of score.

xylophone:

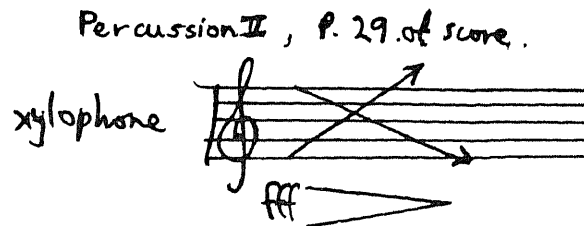
fff

'A' L.H. gliss (b): "white" notes.

'G#' R.H. gliss (#) "black" notes.

Later in the work, within the climax, glissandi are freer and only the general shape of the action is indicated. (Figure 3B.36).

CHAPTER 3, PART B, FIGURE 36



In Henze's 'El Cimarrón', there exists similar notation for keyboard percussion but with less details specified, appearing as a more graphic and visual representation. (Figure 3B.37).

CHAPTER 3, PART B, FIGURE 37

Henze: "El Cimarrón", (XII Battle of Mal Tiempo) p. 78 of score.

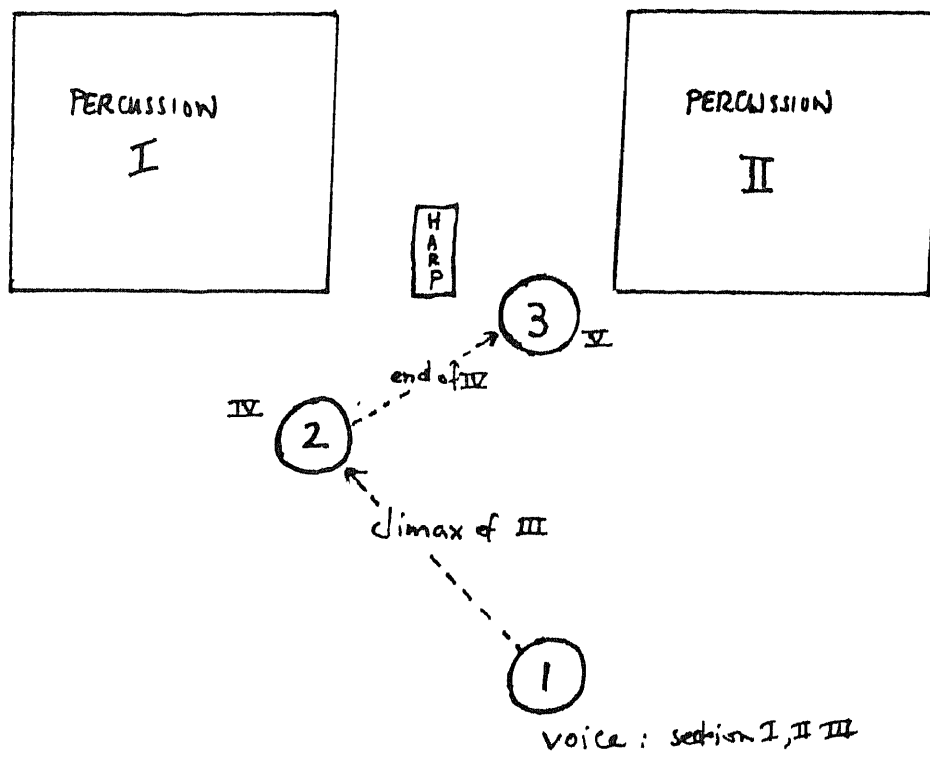


The performer interprets the shape of the gesture freely, according to the general design of the line and the dramatic context. The articulation of the above example, taken from the section 'The Battle of Mal Tiempo' would therefore be influenced by the character of a battle scene. Precise pitches are unessential here, and the line could be said to represent the composer's idea. The spontaneous effect of the gestures and their contribution to the dramatic situations in both Henze's and Berio's examples may thus be seen to be more important than exact pitches.

Just as the drama is emphasised by the vocalist in 'El Cimarrón', as he moves around the stage acting out the part of a runaway slave, the vocalist in 'Circles' also moves, theatrically outlining the musical action. During the climax of 'Circles' (see Figure 3B.31), the voice shifts to a position closer to the instruments, as illustrated in Figure 3B.38 (position 2), visually representing the musical contact with the instrumental material.

CHAPTER 3, PART B, FIGURE 38

MOVEMENT OF VOCALIST ON STAGE



IV: "RIVERLY IS A FLOWER"

As order is gradually re-constituted with the re-appearance of the second poem in section four, the vocalist moves again at the end of the section, to a position next to the harp and between the two percussionists. (Figure 3B.38, position 3). The resolution of the conflict and contrast through the work could thus be said to be symbolised visually, by the vocalist merging with the instruments to form a unified sound group.

As the singer moves to her third position at the end of section four, she plays slow repeated notes on the finger cymbals ushering in the final section based on the first poem 'stinging'.

V: "STINGING"

Although the work may be seen to return to its point of departure, suggesting a circular form, the return nevertheless assumes a character affected by the transformation processes which have taken place through the piece. The regularity and static quality of the final section could thus be said to musically and dramatically represent a reconciliation and settlement between the sound mediums. (Figure 3B.39).

CHAPTER 3, PART B, FIGURE 39

The musical score for Figure 39 consists of two systems. The first system features three staves. The top staff is in 3/4 time and marked *mf*. The middle staff begins with a circled 'V' and is also marked *mf*. The bottom staff is marked *mf*. The second system is marked 'V' and 3/4. It contains four staves. The top staff is marked *mf* and 'stinging'. The second staff is marked *mf* and 'stinging'. The third staff is marked *mf*. The bottom staff is marked 'Hornets' and *mf*. The score includes various musical notations such as notes, rests, and dynamic markings.

This quality in fact may be seen to derive from the repeated note figure which had occurred through the work signposting various developments. It is characterised by a crescendo on repeated crotchets with a double grace note on the last one. (See Figure 3B.16).

The figure appeared first on the xylophone on page 15 of the score, introducing all metal colours which led to the beginning of the central section. Its presentation on bongos later, on page 18, preluded the entry of the voice in the poem, 'n(o)w', (see Figure 3B.27), while the lujon's enunciation on page 22 introduced the same word after the first climatic point of the section. On page 26 the figure was announced on the harp in the lead up to the climax of the whole work. Finally, the vocalist's finger-cymbal strokes at the end of section four could be said to represent a reminiscence of this pattern as it proceeds into the final section.

Comparison between the timbres of the motif's various presentations reveals a gradual development from dry sounds (wood and skin percussion) to progressively richer sounds (harp and metal percussion).

xylophone	-	wood: short dry sound
bongos	-	skin: short dry sound
lujon	-	metal: short
harp		
finger cymbal	-	metal: long sound

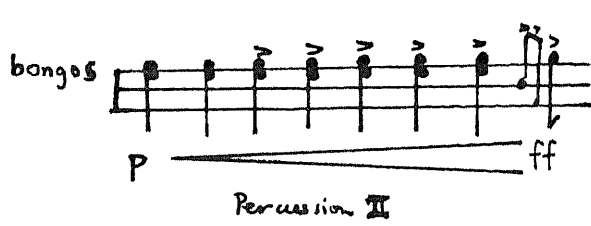
Section V

The motif is in fact reversed as it appears in section five, with the grace notes inverted and the figure heard in 'diminuendo' instead of 'crescendo'. (Figure 3B.40).

CHAPTER 3, PART B, FIGURE 40

A.

section III page 18



Percussion II

B.

section V page 35



Percussion I

A close of the circle thus implied is further emphasised by the return of the dry percussion sounds of maracas and mexican beans which were heard at the beginning of the work. The re-appearance of these colours in fact may be seen to begin a summary of the transformation of timbres through the work's first two sections. From the dry quality of these noise-like percussion sounds heard at the start of section five, instruments with more resonance and definite pitch are introduced: marimba and lujon in Percussion I, to vibraphone in Percussion II later. By page 38, rich bell-like sounds predominate in all parts.

Similarly, the voice begins the section with spoken sounds, which gradually develop into a more singing style from syllabic character to melismas - a reversal of the vocal transformations in the first half of the work. Even the steady rhythmic pattern gradually disintegrates, although the static quality remains. However, at the same time, the music possesses a character free from metric pulse like the opening of the work, thus enclosing the circle.

The vocal quality of the metallic bell-like percussion sounds in contact with the singer's melodic line on 'dreams' is reinforced by the percussionists, who hum certain notes in unison with the vibraphone and bells.

Furthermore, on the vocalist's utterance of the 's' of 'dreams', contact is made with the sound of a sizzle cymbal and clap cymbals, which may be seen to represent a significant link with the opening part of the work. In its first presentation, the 's' of 'dreams' was equated with the dry sound of the maracas and sand-blocks. (See Figure 3B.7). The dry noise-like character of these wood instruments could thus be said to correlate with the rich, long, noise-like sounds of the cymbals, through the vocal contact.

The circular concept within the form of 'Circles' may thus be seen to be established in various ways. For example, contacts are made through the work between different percussion timbres which imply a circle, i.e. wood-skin → skin-metal → metal-wood. Relationships between these percussion sounds have been seen to be derived from contacts with the vocal expressions, the development of which also form a circular design: melismatic singing → syllabic singing → 'sprechstimme' → spoken sounds → abstract vocal letter sounds → spoken → syllabic singing → melismas.

Berio has thus exploited the possibilities of the text in creating links between the diverse sound sources such that a musical continuity has resulted. Consequently, "Circles" structure may be seen to be based on transformations where one sound medium may gradually assume the quality of a different medium by extending its sound range with certain contexts.

Berio expresses these developments through the work with various notational procedures and visual actions and expressions. Rather than being merely technical or subsidiary aspects of the piece, these aspects have been seen to emphasise the transformation processes and are, in fact, integral to the basic structure. Thus, all facets of 'Circles' could be said to be combined in a logical plan, where every gesture and notational device possesses a functional purpose to create a musical whole.

PART C: MORTON FELDMAN: 'THE KING OF DENMARK'

BACKGROUND:

Morton Feldman's 'The King of Denmark', for solo percussionist, written in 1964, presents the use of percussion in an indeterminant situation related to the new musical thought in America in the 1950's and 1960's.

Consisting only of percussion sounds, the work marks an important step in Feldman's development. Here, pitched sound material gives way to sound qualities of different percussion instruments relative to approximate pitch registers of high, middle and low.

In fact, in many ways, 'The King of Denmark' may be seen as a culmination point in Feldman's progress, consolidating various major features of his musical style. He has always been interested in timbre, which could be said to be a driving force in his work, and percussion may be seen as the ideal medium to explore this aspect. Indeed, Feldman had been employing percussion instruments in his works increasingly from the late fifties, so it was inevitable that he should compose a work for solo percussion.

'The King of Denmark' was also created at a time when the composer was perfecting his ideas concerning his 'graph' notation. This may be seen as a result of experiments with various notational procedures through the 1950's and early 1960's by Feldman which would best express his characteristic personal approach to sound.

Feldman, as with his colleagues, Cage, Brown and Wolff, had investigated different notations concerned with indeterminacy in performance, but perhaps even more than the others, he had shown a pronounced concentration on the sounds.

Barney Childs states:

'... for him (Feldman) sounds come first in the creative process and technical procedures come second. ... the inner conception of sound ... has generated his own technical innovations'. (75)

Feldman's interest lay in the physical experience of sounds in space, free to sound in an environment as abstract aural events. The notational procedures thus employed were guided by the composer's aim of freeing the sounds from any structure or scheme of relationships so that each sound could exist as:

'... a separate sonorous entity with no implications concerning what would precede or follow it'. (Barney Childs). (76)

He was influenced in this respect by various musical and non musical sources.

1. The New York School of Abstract Expressionist Artists had been seen to inspire the whole of the indeterminant musical movement. For Feldman, the work of these painters opened up thoughts which did not arise from any musical precedents. He wrote:

'The new painting made me desirous of a sound world more direct, more immediate, more physical than anything that had existed before'. (77)

The painters drew attention to the physical act of applying the paint freely on the canvas which became an object of expression in their work. Similarly, Feldman wanted the sounds to freely occur within areas of time rather than being placed at precise points such that the mixing of instrumental colours were spontaneously created during performance.

Feldman even spoke of his music in terms of paintings:

'My compositions are really not compositions at all. One might call them time canvases in which I more or less prime the canvas with an overall hue of music'. (78)

However, he was not trying to translate the paintings of the New York expressionists into sound. Rather, the philosophies and approach to their work in relation to the materials made clear Feldman's aims and musical direction.

2. The music of Anton Webern also attracted Feldman and his colleagues. They were not concerned with Webern's construction and logic in the sound relationships, but rather the pure aural effect of his sound world. Feldman had said:

'We were interested in the poetry of Webern and not so much in how he arrived at the poetry'. (79)

The silences in Webern's music isolated the sounds and this also became a characteristic feature of Feldman's music. A texture resulted where every particle of sound and sound combination was distinct and their individual characters could be clearly heard.

Paul Griffiths explains:

'Feldman's music ... sounds like an extension of early Webern into tranquility'. (80)

Feldman's sounds are always soft. These soft sounds break quietly through the silence so that the listener has to almost strain to hear them as in some of Webern's scores. (See Chapter One: Webern). Feldman's music is slow moving, almost static, where the listener is not occupied by gestures and relationships exposed and shaped by dynamic contrasts. In this way he is encouraged to attend only to the timbral qualities of the sounds themselves.

3. Edgard Varèse's character was very different from Feldman's, but his musical aims and ideas of sound may be seen to affect Feldman's outlook. Feldman found that generally composers in the past were concerned with the construction of music, requiring structural control for its existence. In Varèse, however, he saw that here was a composer who was absorbed in sheer sound as a physical experience at a time when composers were devising systems and structures to order their music. Peter Dickinson observes:

'He (Feldman) deplored the so called attitude of progress and the obsession with systems and justifications. For Feldman the work of Varèse provided an answer. In "IONISATION" (1931) the music seems to be writing itself, walking a tightrope, and above all the composer is interested in how it sounds'. (81)

Feldman was attracted not so much to Varèse's sounds, as in what they did, and how the composer used them in relation to the idea of the 'emancipation of sound'. (See Chapter One: Varèse).

Both composers, in fact, displayed a pre-occupation with timbre. In Feldman's development of performer choice situations, the only elements which could be said to be consistently determined have been the timbres of the works.

He has said:

'If I was interested in organising anything, it was the timbre'. (82)

In much of Feldman's music the instrumentation is specified, unlike many works of Cage and Brown. He thus may be seen to have control over the general timbral quality of a particular work. In fact, the attention to timbre and instrumentation could be said to be the basic inspiration behind his music. Feldman:

'For me composition is orchestration and so what leads me to begin a composition is a weight, an orchestration which is new for me'. (83)

Varying instrumental combinations are thus used from work to work, the idea for each new piece originating from a certain grouping of instruments.

Although basic timbres may be seen to be fixed in his music, Feldman nevertheless allows the performer important decisions in a work's outcome. These freedoms are aimed at freeing the sounds from a set scheme, rather than asking the performer to improvise. He has devised notational procedures where he tries to maintain a minimum degree of control but which does not place all the responsibility on the performer as in certain works of Cage and Brown.

In Peter Dickinson's article, Feldman has said that he:

'... does not follow Cage's complete emancipation of sound itself, but he recognises that the composer's powers of ordering are limited'. (84)

Dickinson adds:

'Feldman approves of self-effacement but not Cage's abolition of himself'. (85)

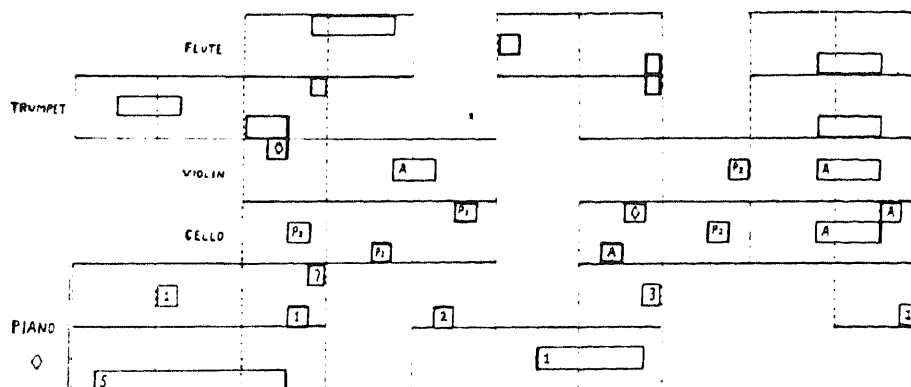
An outline of Feldman's development related to his notations in this regard will clarify his musical outlook as well as establishing the place of 'The King of Denmark'.

NOTATION AND DEVELOPMENT:

Works in the early 1950's were written in a graph-type box notation. Feldman sets down a framework which is determinate in respect to timbre, but leaves choices to the performers regarding pitch, time and amount of activity.

The 'Projection' series of pieces (1951) exemplify the use of this notation. Figure 3C.1 shows a part of 'Projection II', for flute, trumpet, violin, cello and piano.

CHAPTER 3, PART C, FIGURE 1



Each instrumental part is divided into three areas of pitch: high - middle - low. The sounds are to occur any time within the squares and rectangles. In some cases the number of sounds within each box are specified but others not, in which case the player may choose to play any or no sound in that particular box. Various string effects are indicated: harmonic ' $\diamond$ ', pizzicato 'Pz' and arco 'A'. The piano part is divided into two pitch areas, representing the upper and lower half of the keyboard which in turn are further separated into high, middle and low.

However, to Feldman, these early graph pieces were not entirely successful. He found he was still thinking in terms of a horizontal movement of the sounds, which implied a continuity in the music in the traditional sense. In his effort to free the sounds he was also freeing the performers to such an extent that the success of the works rested on their ability to improvise. Feldman explains:

'After several years of writing graph music I began to discover its most important flaw. I was not only allowing the sounds to be free - I was also liberating the performer. I had never thought of the graph as an art of improvisation, but more a totally abstract sonic adventure. This realisation was important because I now understood that if the performers sounded bad it was less because of their lapses in taste than because I was still involved with passages and continuity that allowed their presence to be felt'. (86)

To clarify his thoughts as to how he wanted his music to sound, Feldman employed traditional, metred notation in the following years, where every aspect of the sounds were defined. The 'Extensions' series (1951-3) are written in this way. (Figure 3C.2).

CHAPTER 3, PART C, FIGURE 2

"EXTENSIONS I" FOR VIOLIN AND PIANO (1951, NOV. 12th)

The musical score is handwritten and consists of four staves. The top staff is for the Violin, and the bottom three staves are for the Piano (Grand Staff). The tempo is marked as $J = 124$. The score includes various musical notations such as notes, rests, and dynamic markings (f, p). Performance instructions like 'SORD.', 'Pizz.', 'ARCO', and 'f' are written above the staves. The score is divided into two systems, each with a repeat sign at the beginning.

Although he found this course restrictive also, it nevertheless allowed him to return to graph procedures later with more insight into the notation of his music.

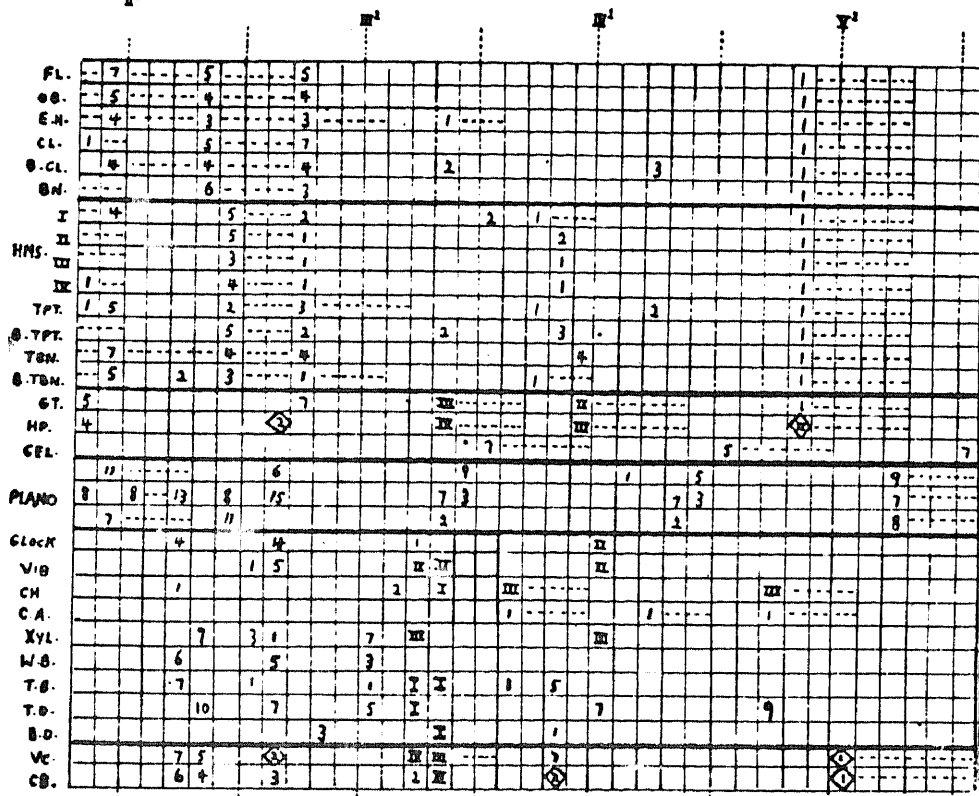
Consequently, in the graph pieces of the later 1950's he introduced more definite instructions for the number of sounds and their placement in time, so that he was thinking vertically rather than in a horizontal continuity. 'Atlantis' (1958) and 'Out of Last Pieces' (1961), both for orchestra, are examples. (Figure 3C.3 and Figure 3C.4).

CHAPTER 3, PART C, FIGURE 3

[illegible]

CHAPTER 3, PART C, FIGURE 4

'OUT OF "LAST PIECES" (excerpt)



A comparison between the two works illustrates a development in terms of the instructions given. It may be seen that in the later work Feldman specified durations of certain events more clearly (with a dotted line), as well as indicating differences between simultaneous sounds (roman numerals) and successive sounds (numbers).

However, although Feldman was increasing the amount of directions it could be said that he was at the same time approaching a notational procedure which could best communicate his musical concepts. Brindle observes:

'Various extensions of this essentially simple graphic principle were devised, usually aimed at indicating more movement of sounds than the earlier scores permitted'. (87)

The resultant music leant towards more variation in terms of a vertical combination of sonorities which avoided the linear sound movement implied in the 'Projection' series.

'The King of Denmark' develops the graph-type notation further, being more specific in certain respects but at the same time presenting more flexibility for the performer. The movement of the sounds could be said to be more defined than in 'Out of "Last Pieces"', but this in turn freed the performer from thinking of the succession of sounds horizontally, in terms of improvisation, while expressing Feldman's idea of isolating the sounds as independent events.