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MODELS AND PROCESSES IN REPETITIVE MUSIC, 1960-1983

by

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A dissertion in the Department of Music submitted in partial fulfilment of the requirements of the degree of Doctor of Philosophy at Monash University.

October, 1983

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SUMMARY

MODELS AND PROCESSES IN REPETITIVE MUSIC 1960-1983

This thesis examines music composed since 1960 which has a high degree of audible repetition. The principle aims of the research are to identify common repetitive techniques in repetitive music from a performance practice point of view. This is achieved through a study of the models and processes contained in individual works and the extent to which they determine and shape the repetition. A large sample of works are examined according to set style criteria which serves as a basis for comparison and generalisation about the genre as a unit.

Chapter 1 defines the terms and outlines the aims of the study. The selection of works is accounted for against a general historical background. Related source materials, research and literature are surveyed and the structural method is outlined.

Chapter 2 discusses the type and range of models used in repetitive music in the light of the norms they set. Chapters 3-6 deal with types of repetitive processes involved in the compositional process: the drone, the pulse, addition, subtraction, augmentation, diminution and various linear and vertical cyclic processes.

(x)

Chapter 7 discusses performance as a holistic process which integrates all models and processes through time. Repetitive music is made audible through performance. The repetition itself may depend on the relationship between freedom and control, performance style, and the organization of the event. Performance is the articulation of the music. Chapter 8 applies this view to the context of one work, Jon Gibson's <u>Multiples</u>. A variety of realisations of the one work show how it is possible for performance choices to change the type and extent of repetition employed. Cassette tapes are appended. Appendices B, C, D, E, provide working documents related to these performances.

Chapter 9 presents the works of the second decade for consideration. Three works are discussed in detail as a sample in viewing the role of complexity in repetitive music.

Chapter 10 draws comparisons and contrasts across the repertoire according to the style chart in Appendix A. The genre as a whole is assessed geographically and chronologically before being placed in a more general new music context.

(xi)

This thesis has been prepared with the assistance and encouragement of many individuals and organizations to whom I would like to offer my thanks. In particular I am indebted to:

Mr. Laughton Harris, for supervision and support; Nia Holdenson for typing the manuscript; Gavin Bryars, Jon Gibson, Dr. Richard Hames and Warren Burt for making scores, tapes and information available;

Val Smith for proof reading;

John Griffiths for typing Appendix A, proof reading and collating;

The Music Department at La Trobe University, the composer-performers John Campbell, David Chesworth, John Crawford, Julie Doyle, Rainer Linz, Gavan McCarthy, Mark Pollard, Carolyn Robb, Richard Vella and the recording engineer Brian Parish who made the recordings of Multiples possible.

CHAPTER 1

INTRODUCTION

One of the most important and dominating elements in the history of music, East and West has been that of repetition. Irrespective of form, style or genre, repetition has provided composers with the possibility of unifying a musical structure. Its absence has allowed for change and diversity. The dichotomy of repetition and change, unity and diversity, gives music much of its life-force and its individuality.

In the absolute sense of two things being exactly the same, repetition has been an acknowledged philosophical impossibility since the writings of Heraclitus or Descartes. While this is so, the extent to which one repeated event or statement resembles another has intrigued and jerked memories for centuries. Repetition confirms information already stated. By repetition, the output of new information is substantially reduced. Attention is drawn towards the degree of resemblence, or the degree of change. Mutation and parody forms exist in this capacity. High degrees of familiarity and constancy are essential to repetition.

Repetition in music can be applied to its structural and internal components. It can be applied to different musical concerns in different degrees. When it is sparingly applied it almost defies recognition. When applied excessively, it is usually said to cause redundancy.¹ The use of this term in the past has often carried with it derogatory implications of excess and superfluity. Redundancy can be a positive feature in music, despite its unpopularity which may be symbolized by information theory with its vested interests in economy and complexity. The degree of repetition which can be said to be desirable in a given situation is a personal value judgement. Repetition has a chameleon-like nature: its meaning and application changes according to user and context.

Repetition in the history of Western music has been explored in various ways in drones, ostinato, passacaglia, theme and variations, canonic imitation. It is also the basis of formal design in ternary, rondo and sonata structures. Since 1960 the element of repetition has become one of the central concerns of younger composers of the post-Cage generation.² They have investigated repetition as a phenomenon in its own right, through rigorous analysis and detailed exploration of every component of musical composition

²See page 10, historical background.

¹See Dennis Koon Ming Kam, "Repetition and the Drift Towards Constant Focus in the Pattern-Pulse Works of Terry Riley and Steve Reich," D.M.A., University of Illinois, 1974, pp.51-9.

and performance. The power of repetition to sustain, suspend, continue, stall, perpetuate, propel, insist and intoxicate have held a new centre of focus for composers and composer-performers. It has brought with it a return to basic musical elements used in simple ways.

Aims

The purpose of this thesis is to investigate the concerted interest in repetition in music since 1960. Specifically this will be achieved in the following ways:

- Major repetitive techniques will be distinguished throughout the repertoire of repetitive music. These will be studied with reference to a wide range of specific works.
- 2. The models and processes at work in repetitive music will be identified from the performancepractice point of view. They will provide a major looking glass through which repetition can be studied. By adopting this approach the many factors which influence the realisation and perception of repetition will be identified, as will its role in the creative act of music.
- 3. A defined set of style features common in repetitive music provides a basis for analysis of all mentioned pieces to facilitate comparisons and contrasts between works and

composers.

- Repetitive music will be considered as a genre with major chronological and geographical trends.
- As a genre it will be placed in a more general historical context.

The Terms

Music

Music is the organization of sound in space. Since the 1950s particularly in the United States, the definition of music has been pushed to its limits. In this study all music composed after 1960 which deals with repetition has been eligible for inclusion.

Repetitive Music

Repetitive music is that music which uses principles of repetition in one or more of its parameters to a significant extent. In repetitive music, the repetition must be audible. Most of the music discussed has repetition as the central idea and driving force. All music which relies first and foremost on repetition as its modus operandi could be called repetitive music. However, the term repetitive music has chronological connotations and pertains to repetitive music since 1960. It was only during the 1960s that a large number of composers singled out repetition as a particular focus for their musical structures. The point at which a piece fails to be

classified as repetitive music is by no means finite. It may depend on the auditory perception of the listener or the work itself may permit freedom of interpretation so that its status as repetitive music could change. Repetition and repetitiveness are not absolutes: they are quantifiable variables. They must be seen in relation to specific musical works. This is the major task of this study.

Selection and Use of the Term Repetitive Music

Repetitive music has been adopted for convenience as a term because it has been widely used both in Europe and the United States.³ Its chief use before the present study has been to account for music by American composers Terry Riley, Philip Glass, Steve Reich and La Monte Young. Dennis Kam and Ivanka Stoianova have pointed to the static, non-teleological function of this music which usually requires extended listening modes involving time dependent continuities. Kam's dissertation "Repetition and the Drift Towards Constant Focus" deals with the concept of the expanded present, possibly the most important stylistic unity of repetitive music.

English writers, Brian Dennis, Michael Parsons

³See use of the term in the following: Daniel Caux, "Cette musique que l'on dit 'répétitive': La Monte Young," <u>Musique en Jeu</u>, No.26 (1977), pp.81-7. Ivanka Stoianova, "Musique Répétitive," <u>Musique en Jeu</u>, No.26 (1977), pp.64-75. Brian Dennis, "Repetitive and Systemic Music," <u>Musical</u> Times, 115 (1974), 1036-43.

and Michael Nyman distinguish between repetitive and systemic music, but the terms have not been shown to be mutually exclusive.⁴ Repetitive music has been used as a descriptive title to convey a recognizable body of music and it is within this general historical context that the term is used in this thesis. The high degree of continuity implied in repetitive music makes the term 'continuous music' very attractive as that music which proceeds by continuity rather than by change. It is especially apt for drone music which forms a large body of the repertoire. The term continuous music also conveys these essential ingredients readily perceived in repetitive music: the lack of silence, the high proportion of continuity or sameness, and the way the music functions seemingly to perpetuate the present. The selection of the term 'repetitive music' rather than 'continuous music' does not change the focus of the study however, as the relationship between continuity and change remains the central issue. The greater portion of repetitive music is continuous. The term 'repetitive' is the most general and familiar and for that reason is chosen.

Experimental and Minimal as Terms

The terms 'experimental' and 'minimal' have also been used to describe repetitive music. Michael

⁴See Christopher Hobbs' definition in Brian Dennis "Repetitive and Systemic Music" <u>Musical Times</u>, 115 (1974), 1037, and Michael Parsons "Systems in Art and Music", <u>Musical Times</u>, 117 (1976), 1604.

Nyman's book entitled 'Experimental Music' 1974, was one of the first sources to document some of this music.⁵ His approach, which looks at musical processes rather than products, has been an important influence on this study. The term 'experimental' is a wide umbrella for the discussion of new music trends since 1950. It has little relationship to repetitive music.

The term 'minimal' has been more successfully applied to some of this repertoire although it is misleading when applied to the mature works of Steve Reich, for example. 'Minimal' is usually used to describe works which present a low level of information for intense study or a high level of perception. Minimalism has been used in the visual arts to describe works such as Mark Rothko's all over colour canvases or the systemic sculptures of Donald Judd. Just as "minimal artists acknowledge both the viewer and the space of the gallery",⁶ composers challenge listeners to a new sound immersion through extended time continuities. Paul Griffiths and David Cope have both used forms of the term in writing of this music.⁷

⁵Michael Nyman, <u>Experimental Music</u>, (London: Studio Vista, 1974).

⁶Gregory Battcock, ed., <u>Minimal Art: A Critical</u> <u>Anthology</u>, (New York: Dutton, 1968).

⁷See Paul Griffiths, '<u>Modern Music' and the</u> <u>Avant-garde Since 1945</u>, (London: Dent, 1981), p.176, and David Cope, <u>New Music Composition</u>, (New York: Schirmer, 1977), p.271.

Models

A model is any prescriptive stimulus to the performance of music. The term is conveniently elastic to include diverse information capable of influencing the way in which music is performed: notation systems, verbal descriptions, discussions, psychological and biological conditioning. All projected plans will be considered models. In repetitive music where there is often very little pre-performance information, the model types have a large degree of influence in determining the nature of the repetition, the manner of its implementation and the extent to which it is applied.

The term 'model' in the past has denoted something pre-existent often in a physical form, especially in its common use in the visual and plastic arts. In that context, models relate to the definitive shaping of the outcoming product such as a cast for a bronze relief or a model for a building. In music, the concept of model has often been used to account for a high degree of influence from another work, including simulation, derivation, actual borrowing and paraphrase.⁸ In some instances it has been used to imply a demise of originality, while other common applications intend it to focus on the past as an influence rather than considering the formative potential of the word. Roger Reynolds in his book

⁸L.B. Meyer, <u>Music, The Arts and Ideas</u>, (Chicago: University of Chicago Press, 1969).

<u>Mind Models</u> never defines the term model in his discussion of new forms of musical experience.⁹ The term model in this study is a general term for preperformance criteria and influences which can yield form and structure.

Processes

A process is a way of doing something; a state of activity. It is a logic, system or force which requires energy to power it. Process is timedependent. It can only be perceived during the passing of time. In music, processes can happen before, during and after the act of performance but their existence is almost always based in human activity.¹⁰ For definition purposes, this factor distinguishes processes from models although these terms have complex relationships.¹¹

A repetitive process is one in which a high degree of repetition is the driving force or stimulus in action. Not all processes at work in repetitive music are repetitive processes, although the number and type of repetitive processes found across the repertoire is quite extraordinary.

⁹Roger Reynolds, <u>Mind Models: New Forms of</u> <u>Musical Experience</u>, (New York: Praeger, 1975).

¹⁰See Chapter 3 for a more detaled discussion of processes in repetitive music.

11See Chapter 2, Figure 2.1.

The Repertoire - Historical Background

Repetitive music possibly sprang from La Monte Young's experiments with extended continuities while he was living in the San Francisco Bay area in the late 1950s and early 1960s. The move to New York by both he and Terry Riley began something of an exodus from the west coast to the east. It was here that repetitive music as a movement put down roots. By the mid 1960s Steve Reich and Phil Glass had also begun working obsessively with repetition and were making a substantial contribution. It is virtually impossible to consider the emergence of repetitive music as a genre without acknowledging the tremendous influence of John Cage. During the 1950s and beyond, Cage challenged musical structures, composition and performance to a degree which cleared the way for total experimentation. Traditions and expectations erased, young composers could legitimately return to basic sound tools and simple systems with new vigour. All the barriers had been removed. It was necessary to devise new ways of proceeding through time.

All the above mentioned composers worked individually in their own ways before the movement could be said to have consolidated. During the building time, the roots were diverse. Some early repetitive pieces came out of wild indeterminate events which pushed the ideology of the nature of music to its

limits.¹² Others came out of old preoccupations with the musical craft of composition such as long duration, fast pulses, or sectional repeats. In New York there was certain interfeeding and knowledge of new uses of repetition between the members of the musical and conceptual art fringe.

In England, Cornelius Cardew and his followers in the Scratch Orchestra had many musical experiments and events to their credit. During the 1960s a new period of creativity spread through Art and Music schools in England. From such innovative experiments were born many new systems and processes which rightly belong in the study of repetitive music. It is difficult to assess whether or not the early experiments, particularly in England were consciously or unconsciously being formulated as belonging to a new 'movement' of repetitive music. It depends on the composer, the composition type and the previous exposure to similar pieces. Being fashionable, innovative, derivative or musically acceptable are social mores as changeable as the people, time and place. Despite this problem and the writer's location in Australia, some effort will be made to view repetitive music as a movement from 1960-1983. Some conclusions as to how repetitive music began, continued and changed can be made after a careful study of the works themselves during this period.

¹²See La Monte Young and Jackson Maclow, eds., <u>An Anthology</u>, 2nd Ed., ([Munich]: Heiner Friedrich, 1970).

Sources and Selection of Works

The aim in selecting works has been to present a broad and representative sample of works by composers of repetitive music. The dominating selection criteria has been the type of repetitive processes used and the manner in which they are implemented. Style criteria such as that set in Appendix A, and performancepractice issues have played important roles in making the selection because of the nature of the topic and the ensuing organization of chapters. Every effort has been made to include examples from eastern and western parts of the United States, Great Britian, Europe and Australasia.

In selecting works, I have tried to show the diversity of styles as well as accounting for the many relationships between models and processes. Works by the four composers La Monte Young, Terry Riley, Steve Reich and Phil Glass do appear frequently throughout as is to be expected in the light of their extensive repertoires and their longstanding commitment to repetition.

Most musical examples appearing in printed sources have been published in occasional anthologies such as the American <u>Soundings</u> edited by Peter Garland, <u>Pieces</u>, and <u>Pieces 4</u> edited by Michael Byron, <u>Break Glass in Case of Fire</u> from the Centre of Contemporary Music and the English anthologies from Gavin Bryars' <u>Experimental Music Catalogue</u>. It is only in the last few years that any composers have

engineered high profile contracts with major publishing houses such as Reich's agreement with Universal. For the most part, I have had to rely on the ephemeral anthologies, reprinted works in secondary sources and periodicals, especially <u>Contact</u> (London) and <u>Ear</u> (New York) as well as the unpublished manuscripts sent to me by the composers themselves.

The largest number of works were chosen because of their audible use of repetition. The discography lists commercially available works consulted. Invaluable tape recordings of English and American performances during the early 1970s were provided by Warren Burt.

Related Research and Literature

A problem connected with this research particularly in the earlier days was the difficulty in procuring scores for analysis. Composers such as Terry Riley, La Monte Young and Phil Glass rarely released scores for others to play, and those that did often withdrew them from further publication. The original writings by some composers, such as La Monte Young, Steve Reich and Cardew therefore became very important sources of information, as did certain secondary sources such as Zimmerman's <u>Desert Plants</u> which contained interviews and artistic statements.¹³

There is little related research and literature

¹³Walter Zimmermann, Desert Plants, (Vancouver: ARC, 1976).

which is not surprising due to the contemporary nature of the topic. That which exists is brief, with few examples and little chronological assessment. Possibly, the earliest and most important work to deal with some of this music and other process music was Michael Nyman's book <u>Experimental Music</u> in 1974. In the same year Dennis Kam's thesis "Repetition and the Drift Towards Constant Focus in the Pattern Pulse Works of Terry Riley" was the first to look at repetition as the sole aim of the study, even if the discussion is brief and the actual music barely dealt with.

Since 1976, following the showing of American repetitive music at the Festival d'Automne in Paris, several important articles emerged dealing with the music as a genre. In the same year an entire volume of the French periodical <u>Music en Jeu</u> was devoted to "Musique Repetitive."

Occasional articles in periodicals and dailies have been the main source of documentation. They are often reports or critiques of events as they happen. There is no major source covering the work of any one composer in detail or the movement as a whole. The most pertinent work on the historical background appears in Kam as does an interesting discussion of temporal and perception aspects of this music.

The present study is devoted to the works themselves, their use of repetition and their models and processes.

Structural Method

The conceptual approach to the repertoire is outlined in Chapter 2 entitled Models. This shows both the diversity of type and application of models. The complex relationship models have with processes is also pursued.

Chapters 3 to 7 divide the repertoire into major groups based on particular principles of repetition, the drone, the pulse, lengthening and shortening procedures, vertical and cyclic principles. Chapter 7 treats performance as a synthesis of processes in action and extends ideas projected in Chapter 2 in preparation for the following case study. Chapter 8 uses different performances of one work, Jon Gibson's <u>Multiples</u>, as a basis for the identification of models and process in one work and their in depth study in defining types and use of repetition.

Chapter 9 studies music of the second decade and following. It disproves the hypothesis that the second decade represents a move toward complexity despite the discussion and detailed analysis of several complex works.

Chapter 10 presents an overview of repetitive music. General considerations of style criteria, the genre as a whole, both chronologically and geographically, its context in new music and historically are drawn together to form a conclusive statement.

Appendix A is a comparative chart documenting

sources, style features and models and processes in each work. The pieces appear as they are first mentioned in the text in Chapter groupings. This chart is intended as a general reference to the basic text in order to supply more detailed information of individual works which cannot always be fully detailed during discussion. Appendix B is a group of <u>Sound Recordings</u> the performance versions of <u>Multiples</u> presented both in excerpt and full performance as original source material for Chapter 8. Appendix C and D are written data associated with those performances.

CHAPTER 2

MODELS

In this study of repetitive music 1960-83, models and processes provide the lens through which the repertoire is viewed. Just as camera lenses vary in ability to focus, articulate or obscure, the idiomatic nature of models and processes may influence the particular musical elements which are brought into In this Chapter, the term 'model' will be seen view. to be complex and varied. Neatly, if generally defined in Chapter 1, the term model can have many meanings and roles in repetitive music. Models and processes are interdependent and often hard to separate. Relationships are varied and can change in one piece. Models deal with important musical material, the selection of information. To study them as a group can help to reveal the mysteries of repetitive music at all stages of the musical process, including music's intention, realisation, perception and evaluation.

The defining feature common to all models is that they exist before the performance begins, whether in physical, written, spoken, or psychological form. A model is some form of precept; a formulated set of information which is important for the musical future,

and which can be an approach or recipe in dealing with that future. It may be as brief as an indication to omit certain specific details such as trills or it could represent a total set of rules or conditions, a form or structure. Models are various and laws unto themselves. They need to be seen against the piece of music to which they relate. Many models may be necessary for some pieces while other pieces may appear to have no tangible model, as when an idea from the creator functions as an unspecified reason for a musical event.

The area marked MODELS in Figure 2.1 specifies certain features which convey the complex nature of the term. Obvious graphic features convey differences between models: different sizes, different shapes, different spatial relationships, different tone colours and different role potential, (lines and intersections). These may all determine musical structure. In musical terms, the exact nature of these differences is of acute importance for the development of a piece of music and possible methods of realisation. Different models can impose limitations or give freedoms. Some general model types can be postulated as loose categories in order to come to grips with the musical implications which they may contain. Mental, biological, physical, and written models are basic categories. Most music requires several models from one or more categories. Nevertheless, these general types serve to group the

FIGURE 2.1

Models and Processes in Musical Composition



different model types. The aim in identifying and scrutinizing models is to establish the exact nature of information they contain. An important by-product of this is the information which is left not articulated. The method in which the model is communicated must also be analysed as it can influence the skills needed to comprehend and interpret it and from the outset, this contributes to style criteria.

Mental Models

The most difficult type of models to quantify are the mental models as they do not exist as physical bodies of information and often operate as subconscious or carefully guarded private material. Many mental models can never be identified because of the difficulty of reaching the information. Each brain, being an individual store of information is in a sense, a living model. Each person, composer, performer or listener has a unique store of experiences and knowledge from which to draw and any decisions made will be governed from the conditioned field of possibilities as perceived by that particular person. This conditioning works as a filter, wittingly or unwittingly. The task of defining mental models as they relate to the compositional process is elusive and precarious. A germinal idea, a floor plan, a performance practice norm, or simply an attitude can all be potential shapers of the music. How definite that model is may effect the quality of its

implementation and the extent to which it is utilized. Scant mental models have been used as the sole determinant of musical creation in new music particularly since the 1950s in work by the Fluxus group in New York.1

One mental idea can generate a great deal of music. Intentions can be catalysts for music whether explicit or inexplicit. Composers, performers and listeners have intentions, attitudes and expectations. Many mental precepts are established among groups as unwritten truths, silent modus operandi or private rituals. Some composers and performing groups make statements in order to communicate their mental models. La Monte Young and Steve Reich clearly articulate their intentions and work them through rigorously to the musical product, although in quite different ways to different ends. Young's statement relates to the heightened consciousness associated with drones of long duration: "My own feeling is that if people aren't carried away to heaven I'm failing."² Reich states that he is "interested in perceptible processes."³ Terry Riley's stance as an improvising composerperformer details the risk and courage involved. "I think that music has to have danger. You have to be

¹See La Monte Young and Jackson Maclow, <u>An</u> <u>Anthology</u>, (New York: Heiner Friedrich, 1963), n.pag.

²La Monte Young, <u>Selected Writings</u>, (Munich: Heiner Friedrich, 1969), n.pag.

³Steve Reich, <u>Writings about Music</u>, (New York: Universal, 1974), p.9.

be right on the precipice to be really interested not gliding along playing something you know."⁴

Mental models are as varied as the following two examples show. They range from spiritual belief systems through to measured brainwaves. The Prima Materia ensemble sing harmonic drones to breath lengths after a period of group yoga and meditation.⁵ The adoption of a collective way of thinking as a desirable and specified mental model is an admitted and important determinant of the musical structure. The emergent behaviour of relaxation and controlled breathing practice, coupled with sustained continuum concentration, shapes the duration, timbre and pitch of the tones themselves. In fact the music becomes the living embodiment of the belief system. All the participants have agreed on the mental model presiding over all performances.

By way of contrast, David Rosenboom's work with brainwaves takes the waves themselves as sound source material for codifying and creating musical structures. The brain, being the organ of the mind emits physical impulses which can be observed as direct musical triggers, primary sources and contingent processing devices. The brain's ability to emit and control complex communication systems through the body cannot

⁴Keith and Rita Knox, "Relax and Fully Concentrate: The Time of Terry Riley", <u>Friends</u>, 3 (1970), n.pag.

⁵See Chapter 7, <u>Groups</u>, for a more detailed discussion of this music.

be overlooked. It controls physiological, biological, emotive and psychological responses, crucial to the act of music. Repetitive music requires prolonged and concentrated use of these human states especially in the performance and perception areas. More generally, mental conditioning, exposure, knowledge, intelligence, values, understanding of musical problems are stored in every brain, the living computer retrieval system. It is the dominant source and filter of all human activity.

Mental models exist in various states. A mental model may be an overriding human condition, a fleeting creative flash of imagination, a finite decision made at a given point in time, a chosen attitude for a given period of time or several of these states simultaneously. The mental activity, always ongoing, is a series of processes. It translates impulses and signals into information as well as having the power to veto models, create new ones or alter relationships between the established mental models. The state of mental models is totally reliant upon the cerebral processes which transmit them.

Self Image and Interpersonal Relationships as Models

Closely connected to mental models are those personality and socialisation characteristics which when located in composer, performer, or listener, can be seen to alter the formation, rendition and assimilation of music considerably. General
personality factors can and do affect the quality of tasks done, their efficiency and the spirit in which the music is conveyed. Prominent among these features are the individual's degree of confidence, degree of radicalism, ability to initiate new behaviour patterns, extent of passivity or aggression, tolerance or extraversion, the acceptance of change, and motivational patterns. Each individual involved in the musical event is a distinctly different blend of these features and, as an agent in the delivery of sound, needs to identify and work with inherent assets and problems. An individual's self image will determine the amount of positive commitment and energy available, just as it regulates the style and success of social relationships. In a group situation, these traits will meet with acceptance and rejection according to other individuals' personality features, attitudes and expectations. Attraction between individuals is likely to occur when there is a high degree of similarity. With increased experience, familiarity may provoke similarity and even affection, thus altering intuitive expectations. Aspects such as age, cultural background, degree of competitiveness, amount of power, status, can all determine different patterns of human relationships in a group. A powerful leader can rise to dominance if the other members are in a state of fear, emotion, unfamiliarity or simply through the leader's individual skills or strength. If this occurs, the heirarchy of the party will be

established so that the social dynamic situation of that group will function as a model, and decisions made will reflect allegiances in the group structure. Attitudes and their formation can be changing or fixed. Colin Fraser in an article on 'Small Groups' comments that:

the members of a group will develop a perception of the group as 'real' and of themselves as members. ...over time, norms internal to the group will arise. The members will act and expect each other to act in standard ways and members disregarding these norms will lay themselves open to disapproval ... sets of norms come to be organized around certain 'positions' within the group ... and the group will come to have a set of roles.⁶

Cognitive and sensory functions in man interweave in a highly complex way and it is difficult to pinpoint the degree of rational and irrational content defined in mental models and social interaction. The sensory perception of an individual's self image, and the ensuing social orientation and behaviour patterns can be crucial to musical performance and the product itself.⁷ These features can rightly be included as pre-compositional models, although they are rarely detailed in western musicological studies. The situation of the composerperformer is very similar to the musician of oral tradition where these factors are important

⁶Colin Fraser, "Small Groups: I Structure and Leadership," in <u>Introducing Social Psychology</u>, ed. Henri Tajfel and Colin Fraser, (Harmondsworth: Penguin, 1978), p.177.

^{&#}x27;This is detailed in Chapter 8, a case study of several performances of Jon Gibson's <u>Multiples</u> by the same ensemble on consecutive evenings.

acknowledged determinants of possible structures and contexts. Cornelius Cardew's work with the Scratch Orchestra utilized social and group interactive processes as musical structures. In a quite different way Pauline Oliveros's work in California, with the Sonic Meditation group is also an example of this. In non-Western cultures, there has been a much more dichotomous relationship between music and social organization whether metaphorically as in the hierarchical Balinese gamelan structures or literally as in the music of the Australian Aboriginal women.

In the discussion of Groups in Chapter 7, it can easily be seen how the structure of musical performance groups, soloists and composer-performers is an agent in defining the repetitiveness and singlemindedness of repetitive music.

Biological Models

Physiological functions such as breathing and pulse rate can provide natural frameworks for specific behaviour resulting in musical characteristics. For instance, breath lengths have been a common regulator for the duration of sounds by many composers including Cornelius Cardew, Robert Ashley and John White. Pulse rates or time ratios compatible with the pulse have affected selection of tempi especially by Terry Riley who has studied the relationship of his pulse and musical pulse in performances over long periods. For him the selection of the right pulse is essential to

the well being of his music: "You can get as far out as you want if you relate to a constant. ...Finding the right pulse is like finding the tuning which is perfect and settled."⁸

If the desire is to make music through an altered biochemical state such as in the music of psychedelic drug users in the 1960s, then the biological metabolism provides a backdrop for induced changes, thus becoming a type of model upon which the musical is somehow dependent. An individual's capacity for rigorous motor control at fast speeds over long periods is heavily reliant upon bodily functions for accuracy. This is particularly so in works by composer Phil Glass who favours fast tempi and high octane performance with little or no opportunity for relief or rest. Accuracy and intensity of the music are reliant upon the maintenance of energy and stamina.

Physical Models

Physical models are much easier to deal with as their presence in repetitive music is usually all too evident. The choice of instrument, technological languages, acoustic environment, geopraphical position, venue, general environmental conditions, and written notation systems may all be physical models. All are potential shapers of repetitive music. The following group of examples shows the diversity of type and

⁸Knox, "Relax and Fully Concentrate," n.pag.

application of physical models in different works.

The Physical Environment as Model

The physical environment is a fundamental sound modifier, before, during and after the event. Whether natural or man-made, physical environments have certain cognitive features such as spatial dimensions, sound absorption rates, availability of light and water, proximity, cleanliness, safety and resources. Musical consequences of these could be limits on the specific time and place of musical performance, the necessity for amplification, choosing an appropriate publicity and communication system and the supplementation of unavailable equipment or materials.

The physical details of environments can also function as affective models. Mountains, rivers, caves, man made buildings may function as signs or symbols with cultural or religious meanings. Myths and rituals are associated with every culture and the selection of locality can be a point of demarcation in determining what is or is not desirable for a musical event. National and political forces attached to the geographical location play their part. The venue, the place, the time and the style of music can be shaped by this model.

The English composer Howard Skempton clearly states that he writes music to fulfil a need of time, place and opportunity. The objective physical facts impose the musical limitations on the possible content.

Self expression is not the aim. One looks out and responds to an external necessity, observing and discovering possibilities in the chosen material. The aim is to fulfill a need. One studies the technical properties of the instruments, the abilities and limitations of specific players, the amount of rehearsal time available, the place, the performance situation and potential audience, all these things determine the character of what is to be composed. The objective requirements are paramount. Once I know these things, the piece is there in all its essentials.

Other composers have seized on the idea of a physical environment as a sound continuity built into a specific space. Max Neuhaus and Ralph Jones both have made extended drone environments, but each treats the specific indoor and outdoor spaces quite differently. The dichotomy of model and process in both installations is intricate as a brief discussion of the individual works reveals.¹⁰

In Ralph Jones's installation <u>CircuitTree</u>, 1974, physical conditions of the out-of-doors are the both model and processor. At every stage, climatic conditions exist as the dominant feature of the sound event, both in design criteria for the circuits and the actual modification of the sound through real time.¹¹ The installation consists of five identical electronic circuits lodged in acrylic globes powered by batteries.

⁹Howard Skempton in Michael Parsons, "The Music of Howard Skempton", Contact 21, Autumn 1980, p.14.

¹⁰See Installation as Process, Chapter 7, for a discussion of the aesthetic basis of installation as musical performance.

¹¹Real time is used to describe the passing of time as it happens during performance. This is distinct from clock time or psychological time. It is time existing as a primary sensation.

All are capable of giving out the same continuous tone. They are placed in different positions in trees where they can be influenced by the air pressure, temperature and light intensity. Each circuit is sensitive to these factors and reacts. This can change the tone, make it intermittent or cause pitch and timbral variation. The sensors detect weather conditions, responding to day and night, hot and cold, light and dark and ambient wind pressure. These cause all the variation to the otherwise five voiced, unison drone piece.

By way of contrast, Max Neuhaus's installation event Underwater Music, 16 May 1976, uses public interaction to process the sound, rather than sensors. Underwater loudspeakers relayed electronically generated sounds in both the air and the water. The presence of the continuous drone challenged the swimsuit clad audience participants to reconsider the acoustic properties of air and water as different: media for sound transferral. The event lasted for several hours as the swimmer listeners participated and shaped the sound environment with their movement and noise. The proximity of the swimmer in relation to the microphone not only affected the perception of sound above and below the water, but the body heat affected the general water temperature, thus subtly conditioning the speed of sound transferral. From the individual's point of view there could be many experiences, events and perceptions depending on the behaviour of the

swimmer and the intensity with which one pursued listening under and above water. The water noises of the swimmers were much more noticeable above the water as were the general poolside noise and ambience. These noises tended to mask the continuous tone which was midrange and not very loud.

The choice of the venue of a swimming pool as a participation environment, and water as a sound transferral medium are physical models which encourage the assessment of listening environments in general. It is also an invitation to investigate an alternative mode of perception. The physical conditions which had to be met by the participants involved appropriate dress, underwater swimming and Sunday morning listening. Physical models are the essence of this piece. They dictate the emergent sound product and possible perception mode.

Musical Objects as Models

Musical Instruments are in one sense models in that they are set bodies with idiosyncratic limitations and strengths. Their characteristics and sound potential in terms of pitch range, available timbre, loudness and method of execution are largely preperformance norms. Some instruments are complex while others are very simple or limited so that in the selection of an instrument, many musical possibilities will be excluded. Bill Viola's piece <u>Gong</u>, shown at the Paris Autumn Festival in 1976, dealt with the

timbral exploration of a single sound source, a large gong suspended on a long rope from the ceiling of the centre of the performance space. The performer, sitting on the floor, shaped the sound according to individual real-time listening patterns and perceptions. Long delay times were waited for, blending harmonic overtones were sought, or certain attacks were articulated in ways to change the standing waves of the acoustic space. The ability of the gong to be swung as a pendulum contributed to this latter musical aspect. The choice of the gong as a physical model was extremely minimal allowing all attention to be directed towards detailed timbral and acoustic exploration. The piece tended to be repetitive in its pitch reference relating to drone music and time lengths common to decay pieces.¹² The resonance of the gong idiomatically defines the length of decay and the overtone structure open to the composer-performer.

Repetitive music generally focuses on one or two elements in depth, pushing them to artistic and listening limits. The physical limitations of instruments become extremely noticeable under these conditions. As could be expected, there has been a certain interest in original mechanical apparatus to serve particular needs. Two different examples are John Taylor's "Multiple Wheeled Ratchet" and Stephen von Heune's "Drum". These simple devices amalgamate

¹²Other 'decay' pieces in which the natural length of sounds shape the piece are discussed in Chapter 4.

freedom and repetition in unique ways. Taylor's ratchet functions as a mechanical instrument to be activated by a performer while von Heune's "Drum" is a programmed mechanical performer. In either case all the performance processing is totally dependent upon the construction of the device as is the degree of possible repetition. In the following discussion it can be seen exactly how the physical limitations of these two devices function as models influencing and defining the musical possibilities.

Stephen von Heune's device "Drum" is a sound source and performer all in one. Basically it is a large drum with thirty-two beaters attached which can be programmed to perform any rhythmic sequence through an electro-pneumatic system controlled by an electrooptical programmer. It is a device which allows restricted musical material to be played mechanically. It has one sound and timbre but is capable of thirtytwo part rhythmic polyphony. As a solo performer, it has been programmed by James Tenney to perform three of his pieces, Wake for Charles Ives, Popcorn Effect, and Tempest. Tenney often scores for equal percussion instruments so that the vertical rhythmic devices of canon, hocket, rhythmic addition and subtraction, imitation and phasing are obvious. Of the four pieces published in Pieces three are rhythmic counterpoints on one pitch. Tenney is very specific in notating duration and spacing the relationship between parts with groups of demi-semiquavers and long drawn out



DRUM

Drum consists of 32 beaters operated by an electro-pneumatic system controlled by an electro-optical programmer. The body of *Drum* is plastic as well as the drum head which was designed by Remo Incorporated. The head produces a sound somewhere between that of a tympani and a concert bass drum. *Drum* is five feet in diameter, is fully automatic and produces at its operating peak, a sound pressure level of 90dB. It is presently on permanent display at the Exploratorium in San Francisco. *Wake for Charles Ives* is currently played the most frequently by *Drum*.

¹³Michael Byron ed., <u>Pieces: An Anthology</u>, (Vancouver A.R.C., 1976), p.138. rolls. Such music would require virtuosic rhythmic skills from performers and it is easy to see the attraction of an electro-mechanical device capable of perfect, non-variable performance.

Ex.2.2, James Tenney, Wake for Charles Ives14



^{@ 1974} JAMES TENNEY

John Taylor's <u>Multiple Wheeled Ratchet</u> is a hybrid between a wheelable music box and a linguaphone. It has five rhythmic tones emitting pulses at the ratio 2:4:5:3 and ten melody pins fixed to the other side of the cylinder. The rhythm section of the strongly percussive bamboo idioglot works as a fixed set of cycles built into the instrument. The performer can only vary the speed by wheeling faster or slower.

The melodic section has ten tongues which "have a softer tone, but their sound has a longer resonance and so is heard melodically in contrast with the staccato of the rhythm section."¹⁵ The pins to the

¹⁵Michael Parsons, "Multiple Wheeled Ratchet by John Taylor", <u>Musics</u>, 20 (December, 1978), n.pag.

¹⁴Byron, p.143.

melodic section are either side of the rhythm tracks. In the following diagram showing the relationship between melodic and rhythmic pins, the similarity with player-piano mechanism is obvious. The fact that it is a cylinder also relates it to barrel organs. The definite musical limits mechanically sustained and made continuous relate it to the music box. Because of the physical feat of wheeling the instrument around, tempo changes can vary the extent to which the pitch-rhythmic contingencies would be audibly constant. However, the rhythmic cycles set on a pattern of fixed ratio relate the 'musical' result to Burt's 3x4x5x6 which is made over repetitive groupings of pulses preset on a synthesizer and sequencer.¹⁶ However, the reliability factor of the multi-wheeled ratchet would be much less than in the case of the Burt piece which is electrically powered. Michael Parsons says of the idiomatic pysical deviation of Taylor's instrument that:

in practice, because of irregularities in construction and slight deviations in alignment, what is actually heard is more complex than this notation suggests; some of the notes indicated as synchronized do not sound quite together, and some of the strikers may at times be striking more than one of the tongues. The overall rhythmic pattern (as well as the tuning of some of the tongues) seems to change slightly from time to time.¹⁷

16Discussed more fully in Chapter 6.
17ibid.

Ex.2.3, John Taylor, Multiple Wheeled Ratchet18



Example of Pinning of Music Box

Technology as Model

Just as these devices work as mechanical models, so too do diverse technological apparatus such as computers, video and digital synthesizers, and sound recording equipment. All these machines have physical capabilities and limitations built into their design. These articulate musical possibilities or relevant use. The tape recorder was certainly one of the greatest influences on repetitive music both as a mechanical device and as a social conditioner. It provided the opportunity of freezing sound images so that they could be duplicated. As a storage component it allowed even the amateur the possibility of retaining performances or compositions for replay at much less cost than the gramophone. As a compositional tool, many new

18parsons, "Multiple Wheeled Ratchet," n.pag.

possibilities became available. New techniques offered new means of prolonging or repeating sounds or conversely changing or varying them. Some of these techniques are briefly outlined below and although by now, over thirty years later, they are obvious and well-known, their potential for effecting continuity and change remains.

Magnetic Tape as Linear Continuity

(a) As a whole

A prepared tape as a whole work or part of a work 'fixes' the content so that the recorded relationship of parts and articulation of the events remain exactly the same, notwithstanding the condition of the machine, the tape and the playback situation.

(b) In part; cycles

The tape loop as a set unit of material provides an endless quality, allowing the possibility of extreme continuity, or prolongation in the passing of time which may even be pushed to the point of stasis.

(c) In part; as a sequencer

By cutting and splicing tape, sounds can be patterned and reordered in new configurations unavailable to the live performer. Sounds can exist without their most prominent characteristics of attack or decay, by cutting into parts of sounds and resplicing them together. A recorded sound spliced in a new context is audibly a very different sound event

from the original, although the initial signals were identical.

(d) Tape delay

An echo image is possible by the passing of the recorded signal over the playback head of the same or another machine. The interval of time between the signal and echo is controllable by the space between the two machines being greater or lesser. Obviously the tape takes more time to move the greater distance between two heads the further they are placed apart. Alvin Lucier's piece <u>The Only Talking</u> <u>Machine of its Kind in the World</u>, 1970, was performed with a 16 machine delay system.

As Vertical Continuity

(a) Multitrack

After monophonic recording, the introduction of stereo sound not only allowed a separated spatial image of the recording signal, but provided two-track layering when recorded on left and right channel independently. With the advent of four track, quadrophonic sound this became gradually increased to 8-16 tracks, until the modern sound recording studios of 32 tracks or more. The possibility of fixing vertical relationships of up to 32 part counterpoint through combined use of the mixing console and multi track machines, is a complex situation which has not been fully utilized by repetitive composers. This is revealed in Chapter 9 which deals with combined forms

and the move towards complexity.

(b) Simultaneous Looping

As early as 1948 Pierre Schafer had made his Piano Study solely with loops by using closed groove phonograph records. Extended to tape, possibilities became enormous as different materials and different length loops could be brought in and out of audibility at will. The mixer is critical unless simple simultaneous straight playback is required.

(c) Phasing

A variant of the loop technique appears in Steve Reich's <u>It's Gonna Rain</u>, 1966. Two identical tape machines with two identical tape loops are begun at the same time. They drift out of phase very marginally as one machine is never exactly identical to the other.¹⁹ As the phase of sound shifts against itself, 'whooshes' of sound emanate. Rock bands were quick to employ this device as well as phase shifters to effect this flanging electronically.

(d) Macrophasing

On a more organisational level, loops of different seconds duration can be arranged so that elaborate rhythmic cycles coalesce and retreat in a fixed time ratio. For example a loop of 13.6 seconds and a loop of 13.5 seconds duration would coalesce once every 183.6 seconds. (See John Melcher's <u>Parlour Music</u> and other examples in Chapters 4 and 6 for appliation

¹⁹See Chapter 6 for a discussion of how this principle influenced the composer's output.

of this principle).

Replication/Variation

Simple taperecorders have potential sound modifiers built in to their design. These have included multiple speeds which allow the composer to alter the speed to half or twice that of the original, or variable speed knobs which can effect more subtle speed changes. Tapes can also be played backwards. The simple modification processes offered by machines heralded much more complex systems of synthesis, including filters, reverberation units and noise reduction units, so that the battery of available musical technology is continually expanding.

The tape recorder is musically and historically an important model and compositional tool. It offers specific possibilities which can be taken up or rejected by composers. From the composer's point of view the same musical/aesthetic questions exist for the selection, treatment and organisation of sound, but the tape recorder's implications for duplication, sequencing, layering, delaying and processing could not be denied. Repetitive composers have used them directly in many ways. Potential musical processes: prolongation, imitation, augmentation, diminution, phasing, retardation, shifting, interlocking cycles, delaying, have possibly been reconsidered as basic tools in a clearer and more direct way because of the tape recorder as an accessible machine.

Written Models

The models upon which Western Music most commonly relies are written models recorded on paper in linguistic or symbolic systems. In this group belong all forms and styles of notation and scores. A large and diverse group, notated models prescribe certain musical information with each chosen system influencing the actual musical result in two ways. Firstly musical information may be defined according to the parameters of pitch, duration, dynamic intensity, timbre, attack and decay, textural density, orchestration, rates of change and structural divisions. Secondly, the type of system chosen to relay the information will influence the content and its possible execution. Familiarity with the system is an important determinant of the quality of the result. One need only to consider the difficulties experienced by innovative composers in the 1950s and 1960s in trying to have their graphic scores interpreted by traditional performers.

No system of notation is complete or perfect from all points of view. Traditional western notation fails to encode rhythmic subtleties of swing for jazz musicians. The development of notation practices since the nineteenth century has encouraged notation style rooted in that period, and one which is quite irrelevant for the printing of historical works. They are often quite misrepresented by this. Models which are adequate for the notation of one parameter may not be apt for another. Over the past forty years, a

diversity of scoring systems has arisen in order to notate with greater specificity of detail the aesthetic needs of particular pieces of music. Composers and performers have explored new techniques and new sound sources in depth from precise control to intended freedoms. Since the 1950s, an increasing degree of performer participation has been allowed for in some compositional systems.

Repetitive music is no exception to the general new music trends in utilizing diverse and appropriate written modes. In repetitive music, which proceeds by continuity, the elements defined are of particular importance in setting the repetition in motion. The number and type of limits set, designate potential complexity and the degree of repetitiveness possible in a piece of music. The sheer range of notation systems and styles requires an analysis of different samples in order to view the prescribed information.

Pre-existent Music as Model

Several composers, especially the British, have been attracted to reincarnating music that they have found from the past. The music as a model for composer or performer is treated as a found object ready for recycling. The use of pre-existent music for composition or creative performance is hardly a new occurrence. The setting of a cantus firmus as a harmonic ground, parody, and variation forms are heavily indebted to borrowing. What is interesting in this study of

repetitive music is which music was chosen by whom, and how it was treated.

In the early 1970s in England a variety of <u>ad</u> <u>hoc</u> ensembles formed which were interested in the revitalization of popular classics of Victorian Salon Music and other music from bygone days. This nostalgia was subjected to whatever musical means were available by groups like the Majorca Orchestra, the Ross and Cromarty Orchestra, the Portsmouth Sinfonia and the Scratch Orchestra.

Old music became primary source material for basic re-assemblage of musical form, structure, chord sequences, orchestral arrangements. Often the characteristic harmonic changes, waltz metres and rather trite eight bar repetitions were left intact to transfer a familiar style. Other times these characteristics were removed, totally or little by little, added to or parodied. Gavin Bryars' use of a tramp song in Jesus'Blood Never Failed Me Yet²⁰ and the hymn tunes <u>Nearer My God to Thee</u>, Aughton and Autumn in <u>The Sinking of the Titanic²¹</u> are two of the most powerful examples of found music used in the service of sentimentality. The repetition of these tunes over and over turns familiarity almost into excess. The

²⁰See Chapter 3 for a longer description of this work.

²¹Gavin Bryars' derivation of musical material in this work is an enormous historical study in itself, and well documented by the composer in <u>Soundings Nine</u> ed. Peter Garland, (Washington: Garland, 1975) n.pag.

nostalgic mood of these works is derived very much from the style of the borrowed models.

Fixed Explicit Notation

A score may aim to totally fix the musical output, as in the case of the piano roll, by Conlon Nancarrow.²² The punched/notched card rolls are individually processed on specially designed punching machines to become at once the model and sound generator. The piano roll is a model which determines the pitch, rhythm, form, texture, density, harmonic relationships and tempi in ways which ensure their exact duplication at every performance. A piano roll leaves little if any room for interpretation and makes difficult proportional relationships possible. It performs perfectly as long as the perforations remain intact and the machine is properly loaded.

By using such a complete and mechanical model, Nancarrow has been able to concentrate on feats so difficult, that they are almost beyond human performance. The duplication of a specific desired performance every time, avoids problems of the availability of suitable performers, the quality of interpretation, and the acquisition of almost impossible musical skills. Similarly, the model dictates sociological factors about the performance of

²²See Gordon Mumma's description of Nancarrow's preparation of the rolls in "Briefly about Nancarrow" in Conlon Nancarrow, <u>Selected Studies for Player Piano</u>, ed. Peter Garland, (Washington: Soundings, 1977), pp.3-5.

the music. There are no performers but a mechanical executant.

While few of Nancarrow's pieces for piano rolls are primarily concerned with repetition, there are some which use pulses, drones, cycles and canons.²³ These reap the benefits of reproduction that such a fixed model provides. The technological models of computer programmes, discs and circuit diagrams are fixed notation systems aimed at exact duplication in quantifiable languages appropriate to the machine.

Traditional Western Notation

Traditional western notation is often thought to be explicit as lines and spaces with clefs and signatures regulate the pitch of sounds. Note values, time signatures, beaming, rests and bars attempt to account for rhythm. In the history of tonal music, these two parameters, pitch and rhythm have been given particular importance so that when a piece of music is coded on staff notation, it is said to be 'composed'. A certain prestige often accompanies this due to westerners' preoccupation with scribal forms and written languages. Traditional notation is less adept in encoding parameters other than pitch and rhythm. Dynamics, timbre and articulation are less explicitly handled. Dynamics require a subjective scale from very soft to very loud, with a different point of reference

 $^{^{23}}$ See the rhythmic canons of fixed duration, Studies 15-19 and Studies 27, 31, 36 and 40.

for every musical situation. They rely on subjective measurements of strong and weak, more and less. Since Varèse it is true that timbre and articulation have received more attention and new symbols have been invented to cope with the desired detail. Electronic systems have measured these formerly unquantifiable parameters into actual proportional yardsticks. Yet for the most part, traditional staff notation continues as the familiar method, despite its limitations. Composers of repetitive music have used it in a variety of ways, as a found object, as a self-contained system, or in combination with other systems.

Michael Byron uses traditional notation in pursuit of control. His drumpiece, Morning Glory, 1975 is a fully notated piece barred in 6/8 to ensure exact relationships between the unison tuned drums. For the first three pages the performers play homophonically before breaking into two and three part polyphony. The incidence of sound and silence is crucial to the piece which needs to be well played in order for the interlocking semiguavers and rests to be heard and their changing roles perceived. The entire musical material relies on these explicitly composed rhythmic relationships as the tempo and dynamics are set as steady states of fast, loud and with sticks, for the duration of the piece. A verbal indication for fine tuning is provided "to permit the lower harmonic

partials to sound freely."²⁴ The notation is simple, focused and minimal with all the energy being placed on one continuum, rhythm.

Ex.2.4, Michael Byron, Morning Glory²⁵



²⁴Score and Instructions are published in Soundings 10, ed. Peter Garland, (Washington: Garland, 1976), n.pag.

²⁵Ibid.

Jon Gibson uses unbarred staff notation for his piece Solo for Saxophone, 1974. The notation system is useful as it specifies chromatic pitches, their direction, grouping and registration. The fast pulsing quavers are shaped in descending broken chords in the free jazz tradition with the harmonic material being stylistically defined. The fact that bar lines or meter are not present is of little consequence as all material relates to the quaver pulse in descending phrases allowing for fluidity of breath, articulation and wind technique. The occasional breath mark comma is added. There are no rests in the piece but the tempo indication, fast, and the pulse patterning make this an extremely virtuosic piece. Letter cues mark off sectional changes generally accompanied by an audible cue of descending B major, C# major or A major figures.

By using specific pitch and rhythmic notation, Gibson controls the exact nature of his melodic and harmonic explorations. He defines the rate of continuity and the speed of change. As a virtuosic piece it needs a skilled player with stamina and an ability to read fast chromatic groups. The familiar notation system should contribute to a good performance without stress and provide the interpretative space for flexible dynamics and articulations which are unmarked. The degree of intensity is left to the performer and the built in limitations of the saxophone.



Gibson's use of staff notation is a prescriptive pre-performance model. It sets the noteto-note details in a way which is immediately recognizable as music with a certain intention. Length, style and requirements are clear. The model contains the results of the compositional process. Many models do not do this so clearly.

Adapted Forms

Composers of repetitive music have freely adapted whichever elements of traditional notation best serve their purpose. Hugh Shrapnel's <u>Bells</u>, 1972 is

²⁶Score provided by the composer. To my knowledge it is unpublished.

written in space notation using five lines to fix the pitch. The spacing of notes is important because the pitches are not equidistant and their horizontal position defines rhythmic flow. The bell parts are linear and monophonic as each performer works through the specified pitches in the precise sequence indicated. Unlike the Gibson piece, the musical style is not obvious at a glance as the repeat signs after each pitch group not only indicate multiple repeats of that unit, but also silence as the performer must pause before moving on. The notated aspect of Bells fixes pitch and to some extent sequence, but a sheet of verbal instructions indicates other musical material and a process through which this notated model must pass. As such, it is a pre-performance model inviting the performer to re-craft it.

The combination of notated modules with verbal instructions is an extremely common method chosen by both English and American composers because it provides tremendous scope for uniting freedom and control in individual and appropriate ways. It is interesting that a music so concerned with the limits that repetition requires, often exists as a real-time process music. Models which set the musical material to be treated repetitively may be combined with those which outline processes to be worked through in real time. They may involve rigour or freedom. The following examples show how models contain individual solutions to the combination of model and process,

repetition and change, rigour and freedom. The point at which the compositional process has been worked through or is left to the performer to further process is abundantly clear.

In the following example it can be seen exactly how Christopher Hobbs uses both a notated fragment and verbal instructions in his piece <u>Music for the</u> <u>Crumbling Cookie</u>, 1970. (Ex.2.6) The eight bar notated fragment defines possible pitch, rhythm, metre, chord progressions, voice leading, tempo and dynamics. The verbal comments indicate structural form, orchestration, textural changes and the degree of improvisation. The verbal instructions show how the notation is a loop, played over and over again and how it is varied through changing contexts. The following figure shows the relationship between parts to be a simple systematic pattern which controls the extent of polyphony and the length of the piece. (Figure 2.2)

Despite some freedom of choice, the piece's use of repetition is crucial to its identity. The audible familiarity established every time the notation is worked through, links it to variation forms and the staggered entries create imitative counterpoint. Both imitation and variation rely heavily on repetition for their effect.

By way of contrast, David Mason's <u>Summer</u> <u>Music</u>, 27 1972, may or may not yield repetitive music

²⁷Printed in Educational Anthology, pp.21-23.

Ex.2.6, Christopher Hobbs, Music for the Crumbling

$Cookie^{28}$

Music for the Crumbling Cookie



For a pianist and any number of melody and/or percussion instruments. The pianist plays the above 8-bar phase over and over in a loop. At his second playing of the phase one instrumentalist joins him, playing an improvised break of 8 bars, which he should be able to repeat exactly. On the next playing of the piano phrase a second instrumentalist joins in, in similar fashion, while the first repeats his phrase. This process continuos until the repetition when the last instrumentalist joins in. At the baginning of the piano phrase a second instrumentalist joins in a similar fashion, while the first repeats his phrase. This process continuos until the repetition when the last instrumentalist joins in . At the baginning of the <u>next</u> repetition the first instrumentalist drops out, the second stopping at the following repetition and so on. When only one instrumentalist and the piano are left, the piano should drop out first, leaving the final instrumentalist to play his break once more before stopping.

1970

Figure 2.2, Realisation of the Interaction of Notated and Verbal Models in Christopher Hobbs <u>Music for the</u>

Crumbling Cookie

Change Contract (Contract)

²⁸Educational Anthology, ed. Gavin Bryars (London:EMC, 1973), p.20. despite its single verbal remark and its notated fragments which all contain potentially repetitive material. The score consists of three pages of chords, rhythms and ostinati. The three rhythmic ostinati and sixteen broken fragments in staff notation (treble or bass clef) are scattered loosely over the pages. The single instruction, "combine these ostinati with the harmonic play sessions below," gives no detail as to how this may take place. Several unknowns provoke the performer to answer questions and make decisions concerning the piece. Firstly, the pathway through the progressions needs to be decided. Left to right, and top to bottom could be assumed as one version, perhaps the most obvious. It is unclear whether each fragment can be repeated or whether silence should separate the fragments as the space between the motifs could easily be assumed to indicate. The exact manner in which the harmonic progressions should be combined with the ostinato is open to question and several alternatives present themselves:

- Play through all fragments with a single ostinato thereby repeating the piece three times.
- Divide the ostinati up, giving each a third of the piece.
- Play all three ostinati simultaneously during the length of the piece.
- Improvise and decide the pathway during the performance.

As no directions are given from the model, no procedure can be seen to be of any greater validity than the other at this stage. Orchestration, length and complexity of musical form would all be decided by the performers. They would be in control of the final musical result. Sustained fifths and fourths are important intervals for the piece and serve as a foil for the assymetrically moving melodic figures. Dynamics and articulation are left to the performers, except on page one. The extent to which a piece such as this could be called repetitive varies considerably from performance to performance. It is reliant upon the degree to which the performer persists with an ostinato or fragment. It could embrace any polyphonic relationships from complete and spontaneous improvisation through the material, through to systematic rigour involving the use of repetitive patterns, or a combination of the two. Models which allow a great deal of freedom allow for deviation from the norm and the single minded focus which by definition typifies the repetitive music. As such, these pieces in some performances could delete themselves from such a study as the repetition of fragment or drone could fail to become the single driving force of the piece. Repetition and continuity cannot be assumed.

Graphic Scores as Models

Robin Mortimore's Very Circular Pieces, 1970,

treat a simple shape, the circle, as a model for nineteen compositions. In each of the nineteen pieces the basic model is a circle, sometimes with small variations such as an intersecting line, letters, numbers, on the perimeter, or the addition of a circle or circles to the original. Small variants in a similar model concept, moderated only by brief notes, provide a performer with material, for nineteen different pieces. Conceptually the models themselves are related thematically through repetition and variation. The music may or may not be so.

Generally the circular line seems to allude to repetition as continuity; continuity of sound and time passing as duration. This occurs in pieces 1,2,4,5 and The circle is a model which defines musical 6. information such as harmony in no.14, rhythm in no.12, and dynamics and direction in no.8, while in other pieces a circle encodes performance-practice issues. These are given high priority and at times represent the only instruction so that music becomes the result of performer activity. Technical difficulty is the focus of pieces 19, 10, 6 and 5; performance space orientation in no.17, listening time in no.13, and the activity of finding stones in no.11. Other pieces deal with extra-musical influences and inspiration. Pieces one and three have fringe lines meandering along a small section of the perimeter of the circles. The comments both refer to duration. In terms of what might occur they both leave elements other than

duration to chance. No.3, being very short, could be a single event and hardly classifiable as a repetitive piece whereas no. 1 written in April 1970, is to be played until the year 2,000 AD: a very long continuous piece conceptualized to last thirty years. In the second piece, performer energy determines the duration as the performer is asked to play until he can no longer. The intersecting lines in relation to the circle of the first and second piece are identical one is a conceptual piece, the other a performance version of the same idea. One can continue to project and compare possible outcomes from these brief 'very circular pieces' but their value as pieces lies just as much in their visual and poetic conception as variation on a thematical model. To present nineteen musical ways of looking at a simple circle is a statement about the performer's relationship to simple stimulus.

The scant nature of these graphic circular models makes the point that a small degree of change, visually or verbally, can yield quite different results, repetitive or not. Because of the amount of room for interpretation, graphic scores have not been widely used through the repertoire, as they rarely work in the interests of repetition.

The circles as graphic symbols do not rely heavily on their context in space for translation like the graphic scores of the 1950s which assigned musical values such as pitch and duration to vertical and horizontal axes. These circles exist as self-contained

symbols for whole events, some minimal, some indeterminate, some repetitive. Their categorization is completely dependent upon the performance realisation. It is interesting that such minimal and similar models can yield such diverse effects. (See Ex.2.7.)

One example of the use of a graphic score which does work in the interests of repetition is that composed by Joan La Barbara, also based on circular imagery. Her piece <u>Circular Song</u> is a circular pathway through eighteen different circular signs. These provide mental images for the composer as well as specific information regarding timbre, the direction of circular breathing and pitch glissandi. The composer adds the following notes:

The diagram below illustrates the picture patterns I visualise and concentrate on mentally during the song. The circles indicate descending and ascending pitch glissandos. Breaks in the lines and arrows indicate the change from inhale to exhale. Transitional figures are indicated by a small '+' outside the circle. The diagram is to be read in clockwise direction starting at top centre with the single descending glissando."²⁹

Repetitive elements in the piece are not immediately suggested from the score. For example, the sound is continuous although there is space between each circular figure. Each pattern in the model is a change from what precedes and follows it, which may suggest that it appears once. However in processing the piece, La Barbara repeats each pattern to its

²⁹Joan La Barbara, Notes from the Record <u>Voice</u> is the original Instrument, Wizard Records, RVW 2266, 1976.



1. very long piece when written in April 1970 performer's note:-

play until 2000 A.D.



2. very long piece.





30 Educational Anthology, pp.14-19.


physical or musical limit which she decides, from either point of view, during the performance. She then moves to a transitional phase before moving on to the next figure. Specific processing treatments used, are not contained in the score, so there is no key. The

^{31&}lt;u>Break Glass in Case of Fire</u>, The Anthology from the Center for Contemporary Music, ed. Bob Davis and Richard Gold (n.p. [Mills College]: Center for Contemporary Music, 1978), n.pag.

symbols are devised by the composer for use only by her, so that they function as a mneumonic to the sound document. Her variation techniques are quite well articulated in the notes accompanying the record. For each repeatable pattern, there are:

two breath changes (at top and bottom of pitch range), switching position of breath change (at middle of glissando), three changes per pitch direction, four, five, then through two unusual The first allows the pitch to rise and variations. fall alternately instead of using breath as the only change factor, using multiple breath changes and smaller pitch changes while the overall direction remains the same. The second variation uses a technique I have developed for producing more than one note as one time (indicated on the diagram by the symbol "I"). At the inhale and exhale split tones are created while the overall pitch climbs gradually. After this the patterns are reversed and the cycle is completed by moving backward more quickly until the final descending glissando.32

This work raises the same question discussed by Gordon K. Green in his article "For Whom and Why does the Composer Prepare a Score?"³³

It is clear that what a subjective graphic score may be seen to contain at face-value, would be greatly enriched by a composer-creator-performer's inside knowledge, working from a heavily conditioned background in experimental vocal technique. The title only vaguely suggests vocal repertoire; not solo, ensemble, range, male or female. Yet when the piece is placed in the context of this composer-performer, all of these things become clear. The model is a very specific and effective trigger and sequence for an

³²Wizard Records, RVW 2266, 1976.

³³Journal of Aesthetics, 4 (1974), pp.503-7.

individual pattern of vocal techniques during performance time for a particular female solo voice, that of Joan La Barbara composer and performer.

Models as Visual Music

Taken to an extreme, written, notated, or graphic models can be augmented to become the music in its entirety, unrelated to a sound event. Models can become two dimensional conceptual art pieces which need no sound processing. In Tom Johnson's collection Imaginary Music, ³⁴ the printed page tells the story. No performance is required; only the mental projection of facets of the model's potential actualization in This is volunteered by the onlooker for purely sound. individual appreciation or comunication. The poetic/ cerebral impact of this type of piece which annhiliates the performers in sound vibrations is not typical of repetitive music, but exists as a curious boundary in the role and functions of models. Three examples of Johnson's collection can easily be included within the repertoire as they focus on particular elements essential to the spirit of repetitive music. All of the fragments are minimal in presentation, centering on limited content for the entire piece. A Gestalt, No. 97 Tremolo visually suggests the oscillations and reiterated particles contained in this simple and

³⁴Tom Johnson, <u>Imaginary Music</u>, (New York: Two-Eighteen Press, 1974). The following three examples are also reprinted in <u>Break Glass In Case of Fire</u>, n.pag.

familiar musical gesture. The element of sustained reiteration can be freely developed, maintained or rejected by the perceiver who in doing so defines whether this model could be classified as a repetitive piece. No. 67 Changes is a small fragment of quavers grouped in threes, offset by a second voice punctuating the constant at irregular intervals to displace the predictability of the groups. Permutations on a single motive or set is an extremely common occurrence, and the title suggests its legacy to bell ringing practices. No.85 One Note for Four Instruments could be regarded as a pulsing drone which contemplates different timbral combinations of the same material as instruments interlock or depart, converge or recede. Such pieces which avoid the sound product highlight the important role of individual perception in mentally processing musical ideas. This exists as the sum total of the performance practice required for this piece.

Chris Hobbs' verbal/poetic scores are models which, like the Johnson pieces, are the entire work.³⁵ They are painstaking in their delivery of all the repetition and changes so that every step in the continuity and change dichotomy can be systematically perceived and studied. In <u>Song 1+2</u>, 1968, the overall material for the pieces is minimal. No.1 consists of the typed capital letters on the word SING always repeated in groups of the same letter, while in No.2

³⁵In <u>Vocal Anthology</u>, ed. Gavin Bryars (London: E.M.C. 1972), pp.16-18.

each of the 74 lines consists of a broken straight line. This gives an overall design of shifting densities, the smaller parts of which invite more complex study to follow patterns of retrograde repetition. Beth Anderson's <u>Crackers + Checkers</u> 1977³⁶ is similar in that it has one minimal source, the words crackers and checkers, which gradually reduce to one letter over a period of text-sound permutations related to tape splicing, which can be understood with or without the tape or splices. Reordering and rearrangement of letters from one word or part of a word is basic to the piece and the model contains all the step by step processes.

Summary

Notated Models are variable in repetitive music just as in most other musics. There are traditionally notated scores, graphic scores, modular scores, motivic fragments, verbal scores, computer programmes, punched cards and visual scores. However, in terms of what they contain, they all have certain features in common. In almost every case there is focus on continuity, extension, perpetuation, and reduction as methods of defining, within narrow limits, the possible sound field of a piece. Most models contain or describe small amounts of information which will steer the music over much longer periods of time allowing slow degrees of change and transformation to be explored and

³⁶Break Glass in Case of Fire, n.pag.

perceived. A model may contain the process on a noteto-note level, or indicate procedures to be set in motion, while other models merely fix one or two sound These may be concerned with pitches, sources. harmonies, fragments, pulses or drones which are understood to be the basis of a music which can be classed as repetitive. Not all models discussed here always yield repetitive music, but they all have the potential. Performance understanding of a model and the style of performance practice, in terms of technique, concentration span and concert situation, will all influence the extent to which even a highly repetitive piece will be perceived as an example of repetitive music. The symbiotic relationship between repetition and change is what gives this music its power to charm, beguile, mesmerise, excite, and the models individually eclipse elements of this relationship to be brought to bear in real time performance.

Combined Models and their Role

Models tend to articulate the criteria of greatest importance for a piece and as such can be excellent gauges of style features in the resulting music. As directives of performance mode, they often define or suggest actions which will influence the spirit of the performance relationships between audience and performer which will in turn influence the reception by the audience of those musical

characteristics. It would be fallacious to regard any part or section of this chapter as a separate entity. Most pieces of repetitive music have influences and materials from various model types. The power of mental models is all pervasive. Many composers have chosen to create repetitive music through diverse means or eclectic systems. Where one model begins and another starts is almost impossible to define. In the following two examples these issues can be seen to be the backbone of the music. Gavin Bryars' piece Pre-Medieval Metrics raises the question of model generation and separation while Warren Burt's Hebraic Variations shows how a diverse group of four different models can be used to gear repetition successfully and determine a performance spirit.

Gavin Bryars' <u>Pre-Medieval Metrics</u> is a score which clearly shows the important musical element of the piece, duration. Bryars uses a method appropriate for the chosen musical materials. In this case a computer printout determines the duration of groups of notes in specific short-long time spans during the entire course of the piece. Verbal instructions indicate how these note-to-note, short-long symbols (.-) may be worked through. This score as a preperformance model, deals with the distribution of sonority in measured space, usually called metre. The computer printout however, is also the finished product of the computer processing based on an ancient model of St. Augustine's '<u>De Musica</u>' in which rules of rhythmic

accent, thesis and arsis and their possible relationships are defined. The composer comments on the relationship of the old and the new in the compositional process:

It was very simple and consisted entirely of the rules for the composition of Latin verse as they are given in St. Augustine's <u>De Musica</u> (4th century A.D.) ...there are quite precise rules about what metrical syllable may combine and what may not. The process involved generating any one of the permissable syllables and then accompanying it with a permitted one. The choice was usually quite narrow as you might be able to glean from the score. The syllables are those which we now call Spondees, Dactyls.37

The computer printout consists of eight pages of four pairs of phrases, each phrase having up to four components being different arrangements of the . and -, a . being as short as possible and a - an appreciable duration of at least one second. The gap between each pair of phrases must be larger than that between each other pair. This is clarified in the following example. (Ex.2.9)

The length and sequencing of this duration is the central issue of the piece. Shorts and longs continue in slightly different combinations over measured time spans continually for a long period of time. The piece will progress slowly if each - is a second. Each page contains 53 lines of the four pairs of phrases so there is a great deal of material generated by the computer for performance. Performance instructions however modify the length and

³⁷Personal correspondence, December 12th, 1980.

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instrumentation leaving it to the performers' conditions of pitch and instrument throughout, and that the beginning and ending have a pair of phrases.

The use of computer processing was useful in arranging, systematizing and presenting important information. The model is fixed in its relationship of parts but it may not always be performed in the same way. Figure 2.3 codifies various stages of development in model generation up to the performance stage. It can be seen that the stages are by no means insular. They relate as models to models with the complexity with which models and processes relate. This piece is

³⁸Rhythmic Anthlogy, ed. Gavin Bryars, (London: E.M.C. 1972), pp.12-20.

particularly interesting from several points of view:

- It is a minimal reductionist score of 53 lines and four pairs, being eight pages of computer printout requiring procedural clarification from the composer.
- It shows one model may be generated from another in this case antiquity influencing high technology.
- 3. It has a twofold existence as a model. In <u>Stage 3</u> of the diagram, the score exists as a pre-performance set of rules for further work. <u>Stage 1 and 2</u> involve synthesizing other material and processing procedures by man and machines.
- 4. The total outcome in musical sound vibrations emanates when live performers act on all these interrelationships and influences. The realisation moulds the product through interpretation.

FIGURE 2.3

Models and Processes in Gavin Bryars' Pre-Medieval Metrics

A <u>METHOD</u> STAGE ONE BORROWED MODEL St Augustine's 'De Musica' Rules of Thesis and Arsis. Primary source Material.	STAGE TWO COMPOSER INTERACTION Composer selec- tion of some syllables and sequenced by computer. COMPOSITIONAL PROCESS COMPUTER PROCESS	STAGE THREE 'SCORE' Computer print- out. NEW MODEL Fragments fixed but instructions allow performer processing.	STAGE FOUR PERFORMANCE PROCESS decides *number of performers. *choice of instruments. *length of parts.	
B <u>MUSICAL</u> <u>CONTENT</u> Possible short-long combinations.	Choice of fragments. Order of fragments.	l pitch per instrument. larger assembly left to player.	THE PIECE Total struc- ture and from real- ised in performance.	

Warren Burt's <u>Hebraic Variations</u>, 1977, is scored for incompetent Violist, two cassette recorders (modified) and a spinning loudspeaker. The title at once suggests the acceptance of unusual if not zany materials - incompetent playing and a spinning loudspeaker - a physical feat which can be threatening to the audience. The score-model is a combination of four different methods, a tuning diagram for viola, traditional notations for George Gershwin's song <u>Summertime</u>, a spatial diagram for the floor plan, and a

verbal description for technical procedures involving record and playback modes using tape loops.

The implied sense of humour is immediately apparent in the anecdotic reference to George Gershwin, as a Californian Jew and the manner of playing the viola incompetently in the style of Ronald Robbro (another Southern California Jew). The tune is to be played 24 times while the technician processes it every third time it is played. The speaker is twirled slowly during the playback. The gradual distortion through the re-recording process of this piece of a familiar tune badly played on one string, is both an hilarious feat and an interesting journey in transformation through repetition. The model, of mixed means clearly defines these source materials and the way they will be performed and processed. It is an appropriate model which articulates various performance practice tools and procedures in preference to the note-to-note intersection. The emphasis in Hebraic Variations is immediately placed on process rather than product.

The number and type of models discussed shows the many ways repetitive music can be made. Repetition in music, even when avidly applied, need not be methodologically or creatively restrictive. Music is a creative act involving many models and many processes.

Relationships between models and processes in repetitive music continue to be individual and can be difficult to define. Their interdependence is as complex as Wittgenstein's rope; carefully woven so that



Q Setup: U Technical: There are 2 carrette machiner used. The playback machine may be normal, but the record machine must be modified so that the erase hedd technician with xx recorders 10-12 The playback machine may be normal, but the record machine must be modified so that the erase hedd technician with xx recorders 10-12 The playback machine may be normal, but the record machine must be modified so that the erase hedd technician with xx recorders 10-12 The playback machine may be normal, but the record machine must be modified so that the erase hedd technician with xx recorders The playback machine may be normal, but the record machine must be woolified so that the erase hedd technician with xx recorders The playback machine may be normal, but the record machine must be woolified so that the erase hedd the uhole performance. Two 60" endless mike. Ioop cassettes (blank) are to be used in this piece. A small cheap loudspeaker, mounted so as not to be too dangerous; is to be twirled on the end of along speaker cable during more of the piece.

Derformance: Two performents: Violist & technician. Technician starts recording machine. Violist begins to play. After 3 repeats of the tune, technician stops recording machine, replaces recorded carsette with blank one, starts recording again, places blank carsette in play unit, plays tape while slowly spinning speaker. Tech. swaps cassettes in machine after each 3 repeats of the time. When violist stops, tech. stops spinning speaker, places record inachine also in play mode, plays both for 2-3 minutes, then fades out. for Plastic Platypus Concare August 16, 1977 Warren Burt

³⁹Break Glass in Case of Fire, n.pag.

different parts have multiple relationships. The model can contain the process or the model can be the process. Neither need be fixed, explicit bodies of information even in terms of the same work. Mental processing, present at every stage of the compositional, performing and listening experience, is impossible to assess empirically. However with these factors outlined and acknowledged, a study of models and processes working together provides an excellent scaffold for viewing repetitive music. Models and processes contain the critical issued for any body of new music:

- what is composed and what is left unsaid?
- how is it created and executed?
- what is the audible result?

In a musical genre typified by the concentrated use of a small body of information over a long period of time, these are the questions which will effectively help to define the nature of the music, its continuity and change. The musical and stylistic features of each work can then be identified and compared.

CHAPTER 3

REPETITIVE PROCESSES. ROOTS: THE SINGLE EVENT AND THE DRONE

It can be seen from Chapter 2 that Models and Processes are so inextricably inter-woven that the task of defining each, even in the context of one work, is far from easy. Yet the word PROCESS¹ in music since 1950, must be one of the most perennially used terms. Despite its broad connotations, its wide grammatical use as noun, verb, adjective, and its diverse use and application by different people, it brings to prominence certain musical notions.

- 1. the act of doing something in real time.
- 2. a system of fabrication.
- 3. a time-dependent notion something which must be lived through.

In repetitive music all of these aspects are important whether it be in the composition realisation or perception of the music. To choose PROCESS as a looking glass for the repertoire acknowledges the fundamental importance of all these elements. The present aim is to study the major types of repetition

¹See Chapter 1.

without losing sight of the essential creative acts by which music is made. The word process then gives immediate status to creative actions, whether by the composer, performer or listener. The idea of work and assemblage and their dependence upon the passing of time is ever present.

It is a view which encompasses rigour and chance, irrationality and rationality, structure and inspiration, but it never loses sight of the effort made by human beings through time. Repetitive music involves different repetitive aspects to varying degrees and it is in the study of the musical literature that models and processes can be seen to yield different 'repetitive' results.

In the following four chapters, the distinct major groupings of repetitive musical processes will be separately examined before the major performance processes are discussed in Chapter 7 and seen in action in the case study in Chapter 8.

La Monte Young

La Monte Young has been called the father of new music by Daniel Caux: "La Monte Young est sans nul doute le père de la nouvelle musique."² He has been generally regarded as the chief seminal figure in the repetitive movement. This is easy to view in hindsight but the extent to which this was actually the case in

²Daniel Caux, "Le Grand Rendez-vous des 'Répétitifs Americains', <u>Le Monde</u>, 21 October 1976, p.21.

the early days is more difficult to assess. Whether or not other composers in the field were directly influenced by him or were in fact working on their own paths simultaneously, Young's music contains germs of nearly every major repetitive technique that has been used across the repertoire. An overriding feature which undoubtedly was a general influence, was his interest in defining limits, carefully controlled to provide a point of focus for the raw material of music. His ability to concentrate on one thing persistently enabled him to relate to the basic material of music, sound, in new and sustained ways. In his Lecture (1960) La Monte Young articulates:

the trouble with most of the music of the past is that man has tried to make the sounds do what he wants them to do... If however, we go to the sounds as they exist and try to experience them for what they are - that is a different kind of existence then we may be able to learn something new... by... giving ourselves up to them, I mean getting inside of them to some extent so that we can experience another world. This is not so easily explained but more easily experienced.³

Here La Monte Young defines a perceptive mode more common to eastern philosophies, that of being completely open to the wash of sound.

This philosophy was lived out by the composer in his experiments with sounds during sessions with Terry Riley for the dancer Ann Halprin in the years 1959-1960. Together they would investigate the randomly chosen timbres of different substances, such

³La Monte Young and Marian Zazeela, <u>Selected</u> Writings, (Munich: Heiner Friedrich, 1969), n.pag.

as metal-metal, or metal-glass, in different combinations over long periods of time.

"Terry Riley and I started making incredible sounds; they were very long and very live, and we'd really go inside of them, because they filled up the entire room of the studio."⁴

It was from this experience that the tape piece, <u>2 sounds</u>, 1960 emerged which has been extensively used by Merce Cunningham in his dance piece <u>Winterbrauch</u>.

Young's Lecture (1960)⁵ shows the influence of John Cage and his encounter with indeterminacy at Darmstadt in 1959. Superficially, Lecture 1960 appears untypical of La Monte Young's writings which are more usually about control and how limits are imposed on sound. It embodies essential prerequisites for his later work in the direction of repetitive music:

- The commitment of staying with something, giving in to the sound, and persisting with long durations.
- 2. The emphasis on the actual raw materials of music:- individual sounds having presence to be perceived in great detail.

While John Cage had cleared the sound fabric and legitimised everything from the most minimal to the most overloaded in terms of musical and extra musical material, La Monte Young's obsessions with sound and

> ⁴Ibid. ⁵Ibid.

duration pointed musical history along a narrower path.

The early 1960s appear to have been particularly fertile for composers and conceptual artists. There was a general interest in working to extend and re-define boundaries. La Monte Young and Jackson Maclow's An Anthology, 1963 is an impressive document collating pieces and events from this time. It reflects poets musicians and visual artists' free and innovative handling of their basic tools often presented in oblique and abstract ways. Already many of these pieces in print employ repetition as a major focus, in minimalist content, methods of mutation, sequencing, rearrangement or concept. In live performance, the activities of John Cage and the Fluxus Group revealed the same spirit. This is the background against which La Monte Young's 1960 pieces can best be appreciated.

I THE SINGLE EVENT

Young's own pieces contained in <u>An Anthology</u> consist of the 3 Piano Pieces for David Tudor and 10 of his own compositions from his <u>Composition 1960</u> set, numbers 2, 3, 4, 5, 6, 7, 9, 10, 13, 15. Numbers 1, 8, 11, 12 and 14 are not articulated in the Anthology or his Selected Writings. All of the pieces have scant models containing only the briefest information. The brevity insures the reductionist nature of all of the pieces narrowing down the musical concept, event, or performance to the most minimal information.

I was perhaps the first to concentrate on and delimit the work to be a single event or object in these less traditionally musical areas. This was a direct development of my application of the technique in my earlier, more strictly sound compositions.⁶

Young makes the single thought or concept exist as a piece, such as <u>Composition 1960 #15</u> to Richard Huelsenbeck and the Piano Piece for David Tudor #2.

Ex.3.1, La Monte Young, Composition 1960 #15 and

Piano Piece for David Tudor #3'

Piano Piece for David Tudor #3

most of them were very old grasshoppers

November 14, 1960

Composition 1960 #15 to Richard Huelsenbeck

This piece is little whirlpools out in the middle of the ocean.

> 9:05 A.M. I December 25, 1960

The poetic themes here are the stimulus for the existing music, however they may be realised in performance. In Piano Piece #3, three things are

⁶Interview with Richard Kostelanetz, in <u>Select</u> <u>Writings</u>, op.cit, n.pag.

⁷La Monte Young and Jackson MacLow, <u>An</u> <u>Anthology</u>, n.pag. established, the importance of small variation in a much larger mass, activity and the inevitable passing of time as demonstrated in old age. The passing of time as duration is investigated in further experiments with audience.

In <u>Composition 1960, #3, #4 and #6</u> Young is clearly impressing the idea that musical performance is the experience of the time itself passing:

Ex.3.2, La Monte Young, Composition 1960 #3 and #48

Composition 1960 #3

Announce to the audience when the piece will begin and end if there is a limit on duration. It may be of any duration. Then announce that everyone may do whatever he wishes for

 $5 \cdot 14 \cdot 60$

Composition 1960 #4

the duration of the composition.

Announce to the audience that the lights will be turned off for the duration of the composition (it may be any length) and tell them when the composition will begin and end.

Turn off all the lights for the announced duration.

When the lights are turned back on, the announcer may tell the audience that their activities have been the composition, although this is not at all necessary. $6 \cdot 3 \cdot 60$

The social situation of the concert-hall is challenged as the basis for <u>Composition 1960 #6</u> in which the performers, some of whom may be drinking,

⁸Ibid.

watch the audience. The audience may join the performers on the stage by purchasing a ticket and then watching the remainder of the audience. A performance may be of any duration.

Ex.3.3, La Monte Young, Composition 1960 #69



Music as idea and music as time socially experienced, are important early statements in Young's <u>Compositions 1960</u>. A definition of music as activity can be gleaned from other works such as <u>Composition</u> <u>1960 #2 and #5</u>, the <u>Piano Piece for Terry Riley #1</u>, and the two <u>Piano Pieces for David Tudor</u>, #1 and #2. These

9_{Ibid}.

involve activities such as turning a butterfly or butterflies loose in the performing arena, building a fire in front of the audience, pushing a piano against a wall until you are exhausted, feeding a piano with a bale of hay and bucket of water, or opening the keyboard cover without making an audible sound.

These extraordinary feats maybe of any duration defined or undefined. The performance of an uncommon social activity in the musical context is important. In <u>Compositions #10 and #13</u> the performance activity relates to the quality of performance of the traditional notion of a musical piece or composition. <u>Composition 1960 #13</u>, to Richard Huelsenbeck states that: "The performer should prepare any composition and then perform it as well as he can."¹⁰

The 1960 pieces which articulate Young's philosophy, style and musical direction, deal with single events or long durations. They are <u>Compositions</u> <u>#9, #10 and #7</u>. Young was perhaps the first to define and be interested in the single event, a unitary distinct experience. The single event of drawing a line, the subject of his <u>Compositions 1960</u>, <u>#9 and #10</u> is described by the composer in the following way:

I have been interested in the study of a singular event... I felt that a line was one of the more sparse singular expressions of oneness, although it is certainly not the final expression. Somebody may choose a point. However the line was interesting because it was continuous - it existed in time. A line is a potential of existing in time. In graphs and scores one designates time as one dimension, yet

¹⁰Ibid.

the drawing of the actual line did take time.11

<u>Composition 1960 #9 and #10</u> are both concerned with continuity expressed in the image of a straight line. <u>Composition 1960 #9</u>, consists of a plain white 5" X 3" card with a single 8cm black horizontal line drawn slightly above centre and centrally positioned, having equal space on both sides. The envelope reads "the enclosed piece is right side up when the line is horizontal and slightly above centre.¹² The piece exists primarily as a minimal conceptual model intended to provoke thought about music as an activity taking time. The model contains no musical material although the composer has said he performed the piece in real time in front of an audience as one sustained pitch.

The model contains the product of the activity but La Monte Young in order to impress the time process involved, composed <u>Composition 1960 #10</u>, a verbal description articulating that activity. In a sense, the two models are sufficiently similar to be considered versions of the same piece. <u>Composition</u> <u>1960 #10</u> could be seen as the actualization of the event of performing the score to #9, while #10 exists as a verbalisation of the process already realised in #9. This terminology and classification can be clarified in the following figure. (Figure 3.1)

The relationship of the two pieces in terms of

¹²Young, <u>An Anthology</u>, n.pag.

¹¹Interview with Richard Kostelanetz, in <u>Selected</u> <u>Writings</u>.

FIGURE 3.1

Composition 1960 #9 and #10. Some Relationships

#9 is a model. #10 is a process. #10 is contained in the score of #9. A line was drawn. #9 is not necessarily contained in #10 as the lines may vary and the experience is different. #9 and #10 can have varied realisations. #10, a process gave birth to all the 1961 pieces, thereby becoming post performance models.

their existence as Models, Processes and Products is complex. The material for each is a straight line yet we know from the composer's realisations of the two pieces, there have been various approaches. One performance of #9 used a sustained pitch, while performances of #10 were attempts with plumb lines to draw accurately a straight line on the floor with chalk in front of an audience. The process of drawing the line from time to time was of indeterminate length. Young enjoyed the piece because of the singular focus involving one thing at a time.

In fact he seemed to enjoy it so much that not only was the activity of <u>Composition #10</u> often performed by the composer, but he chose to record the piece at regular intervals of time throughout the following year, 1961, truly 'following' the line. He

conceptualized this on January 6, 1961, and took the average number of pieces he had finished over the period of time and averaged that preparation of work over time, throughout 1961 from January 1 to December. "It came out to one every 13 days and that night I quite coldly wrote out the dates."¹³

All the 1961 pieces being extensions of 1960 #10, the line piece, had been performed before they had been composed. This singular concept inverts all traditional performance practice notions.

The conceptual repetition and the re-enactment of composition in Composition #10 functions in a unique way here. The model becomes the process which then gives back several new models which are past performance models. They have their realisation in performance before their existence. In this interesting relationship between the model and process, several notions become clear: the conceptual links with Dada, the reduction of materials to almost nothing, the equation of music with the act of doing (process) and the importantce of the element of duration. Since Young's early pieces, String Trio, and Octet for Brass, it was the element of duration that interested the composer most and was in fact to become the most important element in his musical output.

¹³La Monte Young, "In Interview with Richard Kostelanetz", Selected Writings, n.pag.

The Element of Duration

In the model Composition 1960 #9, the line is It has no interruptions; it has no continuous. deviations; it goes in one direction endlessly for as long as you follow it. The length is unspecified. When Young has performed it, it has taken hours. There are 29 such pieces every 13 days for all of 1961. Young has performed them all. He did not erase the line, but chose to write over the same line each time. He comments with displeasure that they all came out differently probably due to the fact that he had not perfected the technique of drawing without the plumb lines. Although this was not suggested in the model it shows Young's interest in accuracy of detail. There is no pitch, no dynamics, no harmony. The articulation of the event of duration is the only force, which seems to magnify the impact of the drawn out line of time.

Duplication as repetition also became an issue. At different points in time, information is different because it is perceived in different terms. The 1961 pieces are viewed differently in the knowledge of <u>Composition 1960 #10</u>. Young was seduced by the impossibility of exact duplication of an activity so that every performance yielded interesting variations even though he drew over the same line each time.

Young is essentially acknowledging an ancient philosophical truth known to Western man since before Heraclitus in these pieces: the relationship between continuity and variation:

I'm interested in things that stay the same although they change in detail. ... variation is an unavoidable factor of life that nothing exists without it. No matter how exact you try to be no matter how many times you try to draw the line exactly the same, things will always be different. This is one of the inherent characteristics of my work.¹⁴

In the two pieces <u>Composition 1960 #9 and #10</u>, Young's personal philosophy and style are exemplified. His interest is in looking at music as a time span, as an unbroken continuity like the image of the continuous line. The single minded direction of the line with no variations or inflections suggests an ongoing drone or steady state frequency. This was to become a crucial part of every other piece since 1960 to a greater or lesser extent. Individual differences and the impossibility of uniformity of activity during performance challenged Young as an improvising composer-performer.

In <u>Composition 1960 #7</u>, in which a perfect 5th B-F[#] is to be held for a long time, these ideas are extended. Continuity and duration are implied by the rhythmic and pitch notation including ties and the words "to be held for a long time." The sound through time still has to be conjectured from the model, due to the lack of information regarding instrumentation. However the parallel pitch relationship introduces a new perceptive mode. The horizontal continuous drone is here expressed as a simultaneous vertical occurrence rather than as one line. Kostelanetz has called this

¹⁴Selected Writings.

feature, "Young's 'radical step'." His interest in chords dates from the mid 1960s in the early pieces Octet for Brass and String Trio. Young says of it;

I was more interested in concurrency or simultaneity than in sequences. I was really interested not only in a single note but in chords while other musical systems have placed great emphasis on melody line and sequence.¹⁵

Young has made a five hour performance of the Over such a period, it can unfold its potential: work. variations in tuning, acoustic placement of sound, psycho-acoustic relationships in space providing varying listening possibilities, a reconsideration of the open fifth as an interval, as well as providing time to consider the presence of upper partials in each note. The interval band of B-F[#] then becomes a sculpting agent in acoustic space. It is both a point of constant reference, and an agent of variation. The relationship between the steady state nature of the drone and its variability through time is dependent upon the nature of the listeners' concentration span over long periods. Composition 1960 #7 is a simple model with startling consequences.

- It precurses what could be called the drone school of repetitive music, sustained tone over extended durations.
- It involves acoustically perfect intervals, being in just intonation.
- 3. It has psycho-acoustic by-products.

¹⁵Selected Writings, Kostelanetz Interview.

4. It is extremely demanding for performer

and listener over long periods.

II THE DRONE

La Monte Young's interest in sustained tone over long periods has been prominent in all of his music and experiences from an early age:

The very first sound that I recall hearing was the sound of the wind going through the chinks in the log cabin...it was very awesome and beautiful and mysterious, as I couldn't see it and didn't know what is was, I questioned my mother about it for long hours. The wind is a basis of sound rather than a fixed pitch. ... the wind is a constant sound, the frequency of which at any time is dependent on its surroundings or location, and therefore not always constant. Sometimes the frequency was fairly constant, during blizzards as the wind blew through the chinks in the log cabin, although even at those times the sound was characterized by that kind of increase and decrease in frequency with which we all associate the sound of a wind storm as the gusts would become stronger and weaker.¹⁶

Other sounds of constant frequency which influenced his music are the sounds of insects, the sounds of telephone poles, motor sounds produced by steam escaping from a kettle or train whistles, and the resonances of valleys, lakes and plains. The endlessness of the telephone wires humming was important for three reasons: the duration of events, the complex tuning and timbres of the sustained tone as well the simultaneity of more than one tone sounding together.

As childhood memories these listening experiences possibly served as mental models,

¹⁶Selected Writings, n.pag.

conditioning Young's musical taste over a long period. Stability and variation were already important to Young even before his encounter with serialism through Schoenberg's assistant Leonard Stein at high school. This proved to cement Young's interest in perceiving quantities and initiating controls. He was quick to assess serialism as a useful method of organizing permutation of a set, but he chose to depart from it:

Ordinal organization applies to line or melody whereas the increasing emphasis on concurrent frequencies or harmony in my work implied the possibility of the organization of the cardinal values both in regard to how many frequencies are concurrent and the relationship of the frequencies to each other.

All of Young's work uses the tuning system involved in nature, that of the natural harmonic series as it relates to a fundamental. This simple system, now known as just intonation relies on simple ratios of whole numbers to define the size of intervals between tones. Young never claimed originality for the drone. As well as nature's drones, he cites the influences of the sustained harmonics of the sho in Japanese Gagaku, the harmonic frequencies required in the continuous drones of Indian, Scottish and Spanish music and the simultaneity of plain chant organum. Common emergent textures in these musics involve sustained pitches upon which a melody is woven. Most of Young's larger pieces in the 1960s, employ just such a texture.

Young was inspired by these musics to investigate drones in a totally new way. He experimented with living with continuous sound

environments over long periods. By constant exposure to sound, Young and his wife Marian Zazeela have developed a peculiar awareness of the following sonic phenomena:

- The relationship of any upper partial to a fundamental.
- 2. The spreading of this sound band in space.
- The effect of physical features such as changing weather, spatial arrangements, night and day.
- Changing listening positions in relation to sound.
- 5. The length of listening span.
- 6. Various psycho-perceptual relationships with the sound source and silence.

Writing in 1969, Young comments:

I have maintained an environment of constant periodic sound waveforms at my studio and home continuously since September 1966. The only exceptions have been that I sometimes, but not always, turn off the equipment when no one will be in the environment at all, and when listening to "other music". Also, I sometimes turn it off to test the acoustical situation for spurious incidental sounds and to study the contrasts of such extended periods of sound with periods of silence. The sets of frequency ratios listened to are often played continuously 24 hours a day for several weeks or months.¹⁷

In this way, Young has been investigating several important aspects of the drone.

1. Having established two frequencies sounding

¹⁷Notes of the continuous periodic composite sound waveform environment realisations of "Map of 49's Dream the Two Systems of Eleven Sets of Galactic Intervals Ornamental Lightyears Tracery," <u>Selected</u> Writings.

together, the degree of precision is proportional to the duration of the analysis, i.e. to the duration of the tuning. The duration therefore becomes a necessity for precision. The study of perpetual sounding of high frequencies in relation to low frequencies has been found to be unequal, the lower notes having to be sounded for longer periods to produce the same number of cycles.

2. The duration of the drone can also be said to induce a psychological state as the repeated signal, the same pitch, is transmitted to the same place on the basilar membrane and transmitted to the same fixed part on the cerebral cortex presumably by the same physical transportation route.

The assumption of place theory and volley theory suggest that when a specific set of harmonically related frequencies is continuous, as is often the case in my music, it could more definitively produce (or stimulate) a psychological state that may be reported by the listener since the set of harmonically related frequencies will continuously trigger a specific set of the auditory neurons, which in turn will continuously perform the same operation of transmitting a periodic pattern of impulses to the corresponding set of fixed points in the cerebral cortex.

Young is interested in defining the psychological characteristics of the ratio of the frequencies to each other just as he has an investment in precision at every other level. His desire to control and manipulate the psycho-perceptual field completely may be one reason why so few records of his performances have been released since the 1960s. The

18_{Ibid}.

influence of mood-related Indian ragas can perhaps be detected.

Certainly the amount of information is kept to a small familiar body - in respect to instrumentation, pitches, harmonic possibilities and dynamics. By defining the constants so intently and perpetuating them over long periods, Young may have a chance in realising his dream. The concept of the drone, simple in ideology, becomes the eternal way of life for the composer; a pathway with few deviations over many years. Nearly all of the pieces in the 1960s are dominated by the drone as a living philosophy. Its influence is not easily discarded as Young has actively sought it as the basis of his musical experience in the concept of the Dream House, formulated in 1962.

The Dream House was initially conceived as a continuous electronic sound environment, played continuously so that it ultimately would exist as an individual life-force. The first fundamental, the drone or the first sound is like the tortoise, it lasts forever and is taken up again from time to time. The relationship of the drone to successive tones is the basis of all music in Dream Houses; it is predetermined by the fundamental's overtone series. Young extends the analogy with the tortoise in his projected image of Dream Houses in the future:

Dream Houses will allow music which after a year, ten years, a hundred years or more of constant sound, would not only be a real living organism with a life and tradition of its own but one with a capacity to propel itself by its own momentum. This music may play without stopping for thousands of

years, just as the Tortoise has continued for million years past, and perhaps only after the Tortoise has again continued for as many million years as all of the tortoises in the past will it be able to sleep and dream of the next order of tortoise to come. ... we are just remembering how long sounds can last.. ... we will become more attached to sound... to have precisely the right sounds in every dreamroom playroom and workroom.... listeners ... may spend long periods of Dreamtime weaving the ageless quotients of the Tortoise in the tapestry of Eternal Music.¹⁹

The Theatre of Eternal Music.

From the single event of a line in Composition 1960, the concept of drone has been extended to a way of living and perpetual endlessness, so great is Young's ambition to control and maintain a continuous concept. His obsessiveness extends to infinity or a total universe. His 'group', usually himself and his wife is called "The Theatre of Eternal Music". The ongoing title for the music which Young and Marian Zazeela perform is known as "The Tortoise, His Dreams and Journeys". This has many subsections including "Map of 49's Dream the Two Systems of Eleven Sets of Galactic Intervals Ornamental Light Years Tracey", 1966. 49 refers to their pet turtle and extracts from the piece appearing on the Shandar label, are titled by the date and time of performance. The piece 31:VII:69 10:26-10:49 pm: will he used to study Young's treatment of the drone, his theory and its musical realisation.

Tuning and setting the limits for the drone

Young uses a small set of predetermined tones and intervals in just intonation being based on a set ¹⁹Ibid. of acoustically correct ratios. He can control the relationship of each tone to the other and only permits those intervals to be sounded which conform to the natural harmonic series so that every possible relationship, vertical and linear remains in 'tune' in the perfect acoustical sense:

Only those combinations of sine waves whose frequency ratios will produce acceptable combination frequencies and avoid unacceptable combination frequencies are then to be sounded concurrently.²⁰

The fundamental tone selected as 1/1 is usually tuned in direct relationship to the hum of everyday electrical current, 60Hz AC, derived from 115 volt power line US, and 50 Hertz AC derived from 220 volt power line frequency in Europe. This takes into account the underlying hum of all AC electrically powered equipment and the hum of the city.

The sound sources consist of sine waves produced from ultra stable sine-wave generators. The specially designed turtle motor is a small stable motor used for filtering an aquarium which Young liked, because of its stability. In addition, there are the vocal drones and improvisation of the Theatre of Eternal Music, a changing group of performers centering around La Monte Young and Marian Zazeela.

Once the pitches are chosen, the drone or drones are set on a sine wave generator. Since sine waves have only one frequency component, all of the material which is permitted must then be thoroughly

²⁰Ibid.
known by the performer. They are permitted to sing only the chords in which every pair of components can be represented by some rational fraction as these harmonically related frequencies produce periodic composite waveforms which Young postulates are more easily assimilated by the brain. Most commonly these intervals are the octave, 5th and 4th in just intonation which can be represented by ratios of 2/1, 3/2, 4/3, with a just toned second, usually 9/8. A mutual decision is made concerning which tones may be sounded together. This becomes a fixed model which all the performers must observe as they improvise entries and exits controlled by acoustic combinations, taste and breath length. Generally, Marian holds a continuous fundamental with certain harmonics being apparent in her voice while Young improvises within a narrow set of complementary tones over a greater pitch range. The relationship of the model and process then become interesting in shaping the flow of the music. The fundamental is tuned, and all other frequencies must conform to it. The limits are set. During performance time, the performers' listening skills and vocal control keep the pitches stable, by being aware of which tones and harmonics are happening and taking responsibility for any changes. These are unwritten processes dependent upon the performers' musical practice, which shapes the linear and vertical construction of sound. This is then further modified by the electronic mix and the playback condition, if on

disc. In the 23 minute subsection of the <u>Map of 49, 31</u> <u>vii 69 10.26-10.49am</u> the relationship of models and processes has been fused in performance time and the constants and variation of the musical product can be seen when analyzed. (See Figure 3.2)

This is a fairly typical example of the dream music from the point of view of the chosen tones, the relationship of parts, vocal timbre, improvisation style and form.

SEE GRAPHIC ANALYSIS 31:vii:69, p.97a.

Keeping in mind that all references to equal temperament are irrelevant, the sung tones in this realisation of the subsection of tortoise, may be set as G F G D G A. The absolute value of these pitches in cycles per second can be calculated when the last G is at 200 cycles, being the G below middle C. It is this tone, sung by Marian and held on the drone sine wave generator which is the point of reference in the piece. It is a double octave above what may be more properly regarded as the fundamental, the low G which is barely audible, being fiendishly low at the bottom of Young's vocal range. The size of the intervals should be in accordance with the unpublished papers "Two sets of 11 Galactic Intervals" to which he is constantly



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FIGURE 3.2

Models and Processes in 31: vii:69 10.26-10.49am



referring.²¹ When measured directly from the Shandar Disc onto a sine wave generator, the frequencies were found to be:

TABLE 3.1

Pitch	Frequency(Hz)	Ratio	Interval	
A	450	9: 8	→2nd	
G	200	4:3-	2:14th	
D	150	.2.2	1511	
G	100	3:2	j stn	
F	88.8	79:8	2:1	
G	50		2nd	

Pitch Frequency and Interval Ratio

The whole number ratios of the simple intervals between the sung and sustained tones can be identified in Hz cycles when q = 200.

The relationship of the sung tones to the harmonic series affects the way the concept of the drone can be realised. There is little doubt of the importance of the note G as fundamental as there are three in sung tones and two in sounding harmonics.

²¹In this paper Young outlines his predeliction of tones which may possibly be sounded together. This is based on the tuning of the tones into whole number ratios, the relationship of each tone to the harmonic series and the secondary relationships of the various over tones series of the sung tones when sounded concurrently.

Each of the sung tones can rightly be said to be its own fundamental of a particular overtone series yet in the context, Young has gone to extremes to interrelate the sung tones as part of one harmonic series. The three sets of overtones as a series calculated on three different octaves on G can yield different numbering sequences, but the overtone pattern for each is the same, yielding an inherent doubling system intentionally devised to give support to the harmonics and to increase their audibility. (Table 3.2). The sine wave drone as well facilitates the hearing of the 5ths and octaves of the overtone series and is the upper constant for the full 23 minutes. It is a continuous plateau against which sound relationships vary above and below, both in terms of sung tones and the harmonic by-product. It is the only meeting place for the drone and both voices, and therefore can be the only point for ensemble unison.

The remaining intervallic relationships are very simple consisting of the just tuned octave 2/1 fifth 3/2, fourth 3/4 with two symmetrical whole tones either end G-F and G-A. The relationships of all the sung tones except the low F relates to the harmonic series above the low G fundamental. However the size of the second F below the G being 9/8 is not in tune with the harmonic series. That note when considered as its own fundmental has its seventh harmonic in tune with the g, but as it is sung on the record, it is in no way connected with the harmonic series of the G

TABLE 3.2

Upper Partials of the 3 Fundamentals on G.

50 Hertz	100 Hertz	200 Hertz
G 1 50	G 1 100	G 1 200
G 2 100	G 2 200	G 2 400
D 3 150	D 3 300	D 3 600
G 4 200	G 4 400	G 4 800
в 5 250	в 5 500	B 5 1000
D 6 300	D 6 600	D 6 1200
F 7 350	F 7 700	F 7 1400
G 8 400	G 8 800	G 8 1600
A 9 450	A 9 900	A 9 1800
B 10 500	B 10 1000	B 10 2000
C [#] 11 550	C#11 1100	C [#] 11 2200
D 12 600	D 12 1200	D 12 2400
E ^b 13 650	13 1300	
F 14 700		
F [#] 15 750		
G 16 800		
18 850		
19 900		
20 950		
21 1000		

fundamentals.

It seems more likely that during performance time, the practical orientation toward the interval structure treats the divided octave as a centre with symmetrical whole tones on either side of it. While there are performance discrepancies with the interval of a 2nd and its tuning, many of the sung tones do conform to the harmonic series and basic overtones are recurrent. These need labelling to show their harmonic function.

FIGURE 3.3

Relationships of Upper Partials to Fundamentals.



From a fundamental of 50 hertz, G, Marian and the drone can be said to be maintaining the 4th harmonic. The prominent harmonics DBG particularly B-G at 600 Hz, 500 Hz, 44 Hz are the 12th 10th and 8th harmonics of this fundamental. If expressed from the fundamental G=100, Marian and the drone sing the 3rd harmonic and the common major triad falling sequence 654 then becomes the 6th 5th and 4th harmonics. For purpose of analysis this latter numbering will be preserved as it doubles registration Hz and number of harmonics. The corresponding pitches and harmonics are obvious in Figure 3.3 where sung tones are marked in

heavy print while the harmonics present are drawn with a dotted line. Plotting the harmonic series has many problems:

- The choice of a fundamental in a combination of simultaneously sounding combination tones is arbitrary. A sung tone can also be a harmonic of a lower tone.
- The variability of recording technology in playback space can vary from one physical situation to another.
- 3. The psycho-perceptual factors involved in the measurement of partials as relating to one or other frequency can condition results. The listener's orientation and perception is crucial.
- 4. The analysis of the recorded product after the event may not reflect all the performer's perceptual modes and chosen listening centres at the time of musical experience.

In the recording it is possible to hear imperfectly tuned just intervals. Theory and its realisation becomes an issue. Young insists that every tone is considered in relation to its harmonic series and that all the singers/participants can account for every possible relationship at any given moment. This not only refers to the 6 sung tones but every harmonic relating to each fundamental, their overtone series and respective sum and difference tones. Musically in real time one must question the

position of the participants' ability to hear and effect every combination. The performance demands of this music are great. It possibly explains why Young has always been the sole mover, and why other performers often relate to a drone. He only has to worry about his own tuning.

Despite performance difficulties, the harmonics are easily audible so some attempt has been made to plot these on the analysis. (See Figure 3.3)

These harmonics extend the harmonic function of the drone considerably through the vertical space so that the inner strength and dominance of certain notes is intensified or weakened. In addition, the sum and difference tones between certain frequencies reinforce the simple interval structure already established. The drone in this piece is an on going continuous band of compliant vertical relationships.

Musical Style and Process

The theoretical concept of the drone is processed in real time by the musicians who improvise with their understanding and physical capacity. They realise the potential of that theory minute by minute. The ability to speedily recognize all vibrations, sources and particles and instantly work within it is a virtuosity in itself. Added to this is the skill of singing exactly proportionate just tuned intervals perfectly over long periods of time even though the drone provides a constant audible tuning centre. It is these factors which really determine the note-by-note

details of the piece, the musical practice. It is an improvisation which places the tones over the 23 minutes.

A basic factor of improvisation is the interrelationship between the participants. The variety of people with the drone yield varied textures although their roles are fixed from the outset and never changing, Marian and the drone are the constants and L.M. is the activator. Together these combinations result:

TABLE 3.3

Textural Variety in 31; vii: 69, 10.26-10.49am

TEXTURE			PLACE IN WORK	
1.	Drone only.			end
2.	Drone and Marian.	Ĩ	15+16	mins
3.	Drone & L.M.Y.	Unison or harmony.	3	mins
4.	Drone, Marian & L.M.Y.	Unison.	18 mins	
5.	Drone & Marian.	Intentionally singing harmonies.	16-17	mins
6.	Drone, Marian & L.M.Y.	In harmony.	18	mins

The interval of Marian to the drone is always unison except briefly at the end, whereas with Young, the interval varies. The changing degrees of activity and interaction give elements of variety to the

section, Young's activity being contrasted to the stillness of Marian's solo. The durability of continuity and change is always in the foreground. Marian's momentary rise up a tone at 21 minutes has great impact as a major shift in a tonal centre even though it is such a tiny movement. The interval has been sounded already by Young. The drama comes from the sustained context from which it emerges; it is utterly unexpected. Another factor which compounds the situation is the failure of the two singers to be together in pitch at this point. There are other points where the tuning can also be questioned (18 mins), yet generally the intervallic relationships between the sung tones are maintained quite well.

Young's style of singing uses many repetitive motives. Common patterns are:

1. Octave leaps between the Gs,

- Entry and ending with motives on the 5th of the chord D.
- 3. Trills on GA starting slower and accelerating.
- 4. The lower GFG_GGFG.

5. Variations on all of these motives are common. These are Young's structural devices or building bricks in real time.

Much less common are the larger leaps of over an octave (8 mins, 8, 20), where the notes passed through are not articulated but rather part of a glissando. Notes marked with a horizontal line are delineated. Several are paused upon for some seconds

to allow the harmonic points between the parts to establish themselves, (4 mins, 8 mins, 14 mins).

The durations of the singers are mostly determined by breath lengths, but at times silences are held by choice. (Young 16-17 mins, Marian at end). Pitches F and A, being supplementary tones, are never held for the length of a breath. The singers dovetail their breath lengths to re-inforce the concept of the drone as continuity.

Style and Timbre

The singing tone of Young and Marian is fairly nasal, generally on the vowel pattern 'uh', which tends to help the upper partials sound, as in Tibetan chant. At 18 minutes this is varied very briefly when Young sings 'mm' to finish the fragment. It is a cursory deviation only and he resumes the next group with the 'uh'. Young's vocal timbre, wide intervallic leaps, trills, and extended glissandi sound very similar to Pandit Pran Nath, traditional Master vocalist in the Kirana style, with whom Young studied.²² Whether or not Young's choice of these features was influenced by Pran Nath at the time of this piece, is something only Young could truthfully answer. The record was first made in 1963, Young having heard him in 1967, becoming his disciple in 1970.

Form

Young's 31:VII:69 is drone music. A continuous

²²See Discography, Pandit Pran Nath, <u>Ragas</u>, Shandar 83.514, 1971.

band of fairly stable frequencies extend over 23 minutes without interruption or silence. The sine wave's drone is a constant. Restrictions are heavy, 6 pitches, 3 sound sources. The fabric is woven by performer improvisation over a mechanical drone spreading the material in a continuous manner with subtle variations. The dichotomy of continuity and change exists with stringently set moulds, and constants. Variation is achieved through motivic mutation, changing interval structure, sporadic unison and fifth harmonic alignments and slight dynamic fluctuations. The charisma of the form of the piece lies in its pre-set simplicity which when perceived moment through moment, takes on hues and tints of different colours. The momentary change to the unison A near the end functions as a brief climax or point of direction but it is soon supplanted by the drone which seems to symbolise the continuous state of being, rather than directionality.

Young is not the only composer to be excited with sounds of long duration or extended points. Parallels can be seen in Feldman's pieces of the 1950s, in free jazz and rock of the 1960s. One note, one chord continuums exist in many of the world's musics, such as Bulgarian and Scottish bagpipe music and the didjeridoo playing of the Australian aborigines where the drone consists of a fundamental and upper partial forming the interval of a 10th. This is another vertically spaced drone. Dave Smith has drawn

attention to Young's predilection for the 3 notes DGA, often referred to as the dream chord, as being the same three pitches upon which much of Malaysia's Temiar Dream Music is based.²³ In the 1960s and 70s, extensive use of the sitar with sympathetic strings, Indian concepts of continuity, microtonal tuning and glissandi were all common in rock music. Yet the concepts of reduction, the single event, extended continuities and the drone were marked out by Young in a way which was to have seminal influence throughout the repertoire of repetitive music.

The Concept of Reduction

Several compositions have concerned themselves with reducing the number of pitches used. Extreme examples of this are Phil Corner's graphic piece <u>One Note Once</u>, Gavin Bryars' <u>Pre-Medieval Metrics</u> and Christopher Hobbs' <u>One Note</u>, which are all based on one note. Jon Gibson's <u>30's</u> for two pitches and David Mahler's 3 pitch <u>Pieces</u> treat a few pitches in extended ways. These contrast Howard Skempton's tiny pieces such as <u>African Melody</u>, 1969, and <u>Humming Song</u>, 1967, which treat the scarce number of pitches in a sparse way allowing each tone to be held until it naturally decays in an uncluttered minimal backdrop.

David Mahler's <u>Still Life</u> : <u>Michael Kaempf</u>, 1971, for four string players, violin, viola, cello and double bass is a thirty minute piece of sustained bowed

²³Dave Smith, "Following a Straight Line: La Monte Young," Contact, No.18 (1977), pp.4-9.

sound with no silence. It is built only on the pitches E A D G C F with a preference for open strings and without vibrato. This simple piece consists of linked semibreves throughout with little movement in or between parts. The main cueing device is the changing dynamic given to each tone which controls the degree of emergence and recession of individual players within a continuous band of consonant sound. Unison 5ths and 7ths carve out important spatial relations. Every part has long sections with four sustained breves on one pitch so that the continuity of the banded sound as a series of continuous strata is maintained.

Terry Jennings' Piece for Strings, 1960, and Chris Hobbs' Trio, 1968, are string pieces which also use sustained tone over long durations. They favour simple interval structure, with octave doubling, open 5ths and 2nds, plain tone without vibrato and soft dynamics. Both pieces differ from the previous pieces in using large amounts of silence as structural elements. This influences the perception of sustained tone as drone. It is interesting to compare these works based on continuous duration. Jennings, working together with Young in California in the 1950s arrived at duration as the most important focus in music very early. The sustained tone and soft dynamics have definite links with Morton Feldman. The plain timbre and simple harmonies in a relatively sparse textural field has much in common stylistically with Young's music.

Eugene Bowen in Long Bow Angels²⁴ for five basses, 1973, is another piece using string drones and soft dynamics. At any given point there are at least 4 drones sounding and no two players change pitch at any one time. There are two main solo sections given to the lowest bass which ends with an improvised section based on octaves and harmonics of F major. There is some variety in the speed of bowing and articulation of the drone. Slight 'tremolo' is indicated as well as 'getting faster', 'mostly legato' and 'all legato'. The drone as well as being an agent for continuity and stasis, is treated as a variable in two respects, the harmonic interval as in Young and Jennings, but also with respect to attack and decay. There is no silence in the piece. All musicians play continually.

Drones

In the early 1960s San Francisco was the seat of much experimental music with early investigations in extended duration, minimalism, improvisation and pulses. Later, further south in San Diego, sung drones became an important element in three different groups working at UCSD, Extended Vocal Techniques EVT, Prima Materia and activities linked around the composers Kenneth Gaburo and Pauline Oliveros. Each of these factions has their own approach to the singing of drones and extended vocal techniques including glissandi, multiphonics, in-out breaths, high squeaks, octaves and formant glides. All use sung tones of

²⁴Published in Soundings 7-8, pp. 9-11.

extended duration as an important basis for their work. Kenneth Gaburo who was head of the Centre for Music Experiment at UCSD in the early 1970s composed The Flow of U, 1973-4, which was rehearsed over a period of 4-5 months. The piece consists of one note sung for 22 minutes by the New Music Choral Ensemble No.4. Two females and one falsetto sing one tone, on one phoneme, '00'. It never changes from a pure beatless continuum as if all the singers have extended air capacities. The piece resembles a laser beam as the constant sound is so stable and in tune.²⁵ This is achieved by the ensemble rehearsal of the singers who breathe out of phase with each other increasing and decreasing their individual dynamics to mask the performer 'ins and outs'. The dynamic plateau is maintained by this constant co-operation of the ensemble to improvise and interact with each other.

This piece is one of the purest realisations of the drone as extended continuity in every musical parameter that exists in the repertoire. Natural harmonics are never forced; the focus is on tuning.

Joan La Barbara's <u>One Note Internal Resonance</u> <u>Investigation</u> of the same year treats the tone as a tool to be worked with spatially throughout the body, and the <u>Prima Materia</u> work on the drone from a religious perspective, that of sound yoga. An extended

²⁵Analogy made by Warren Burt in an interview with Kenneth Gaburo recorded with the composer in San Diego played by ABC FM 1981.

discussion of these works appear in Chapter 7, Groups. Factors which all groups have in common are improvisation, tuning, resonance, and the concept of drone as being more than one tone when the natural harmonics are excited.

Ted Sznato points to primitive and ritualistic influences of non-western musical practice upon this music, particularly the influence of Tibetan and Mongolian folklore. He singles out the singing of one tone with clearly audible harmonics which do not go out of control such as that sung by the Tibetan monks recorded on Nonesuch #72055 and #72064. He also points to the secular musics of Mongolia, Vietnam and Siberia which have a similar tradition.

While the parallels are clear, the attributing of non-western influence may not always be correct. Joan La Barbara states that her investigations of note splitting came about through her own pursuits:

Well I didn't learn it from the Tibetan monks, no, I wish I had, because it probably would have been a lot easier. Most of the things that I've learned have been through explorations and improvisation.²⁶

Guy Klusevsek's <u>Depth of Field</u>, 1973, is a vocal drone piece in which a chorus divided into two tenors, three altos, and two sopranos maintain one pitch per part for the length of the piece. The singing of harmonics is encouraged by changing the syllables from 'mm' humming, a recessive part, to the syllable o,

²⁶Interview with Walter Zimmerman, <u>Desert Plants</u>, (Vancouver: A.R.C., 1976), P.154.

adding overtones to increase the volume. The reverse procedure is also indicated in the score. "i.e. gradually decrescendo and gradually form 'mm' by dropping overtones - Thus bending back into the group sonority".²⁷ The Drone in this case is stable as a vertically sounding harmony on C C[#] D D[#] E F, part. There are no pitch changes for the length of the piece, only the degree of emergence and recession caused by changes in dynamics and timbral formation.

In two of my own works drones and their relation to space are further investigated.

In 'Requiem for Goldie' Tank Piece #3, 1979, the drone as a fundamental with harmonics is used to begin the piece which is a vocal improvisation in an enclosed cylindrical cement water tank. The environment as an enclosed acoustic shell helps to amplify the voice and modify the overall timbre by allowing tones and harmonies to ring on due to its naturally long decay time. The echo has the effect of doubling in unison. The piece is less minimal than other drone musics especially in the way it unfolds. Outside environmental sounds become more important and new musical ideas are introduced using 'in-out' breath sequences of the vowels in Goldie's name ol ie oo i ee which removes the focus from the drone. Sung tones of long duration completely direct the piece, while different sets of harmonics on the 5 sung tones vary in

²⁷Guy Klusevsek, "Depth of Field" in <u>Soundings</u> <u>7-8</u>, p.110.

length. The distinction between sung tones and harmonics can be quite audible or ambiguous so that the drone is sustained, changed timbrally or fragmented.

In <u>E Mode</u>, of the same year, for two flutes and double bass, a bowed E holds the entire piece together for the full 12 minutes. The score is a model which outlines the spatial distribution of the material through the performing space. It provides a pathway for the players, with cueing spots to change musical direction and content. (See Ex.3.4)

In this piece the double bass E drone is held and its continuity is reinforced by the flutes who have all their pitch material restricted to the mode related to the drone. The motivic improvisation is kept dynamically low and simple so that the continuity is perceived as a slowly moving spatial phenomenon.

Michael Parson's vocal piece <u>Mindfulness of</u> <u>Breathing</u> is another example of a piece where the drone has a bass role, to accompany another form of repetition. As in <u>The Flow of U</u>, its drone is achieved by the dovetailed breath lengths of the four drone voices. The remaining six voices are involved with working through the same text individually at their own rate. In this way the drone gives a constant bass continuum, welding the piece together. The drone has a support role although the text speakers command most of the attention.

The drone has had many roles in repetitive music. It has been the single content of a piece, a



2 flutes - movers, using only $D \in F \in A \otimes B^b \subset D$ of the lower register and 1 double bass open string E drone.

- Cyclic pathway. One note per breath. Drone E to be dovetailed.
- Move up the scale slowly staggering changes between players and reverting to low tones.
- Player one reverses procedure of 2 from top note down. Player 2 repeats 2 to form contrary motion.
- 4. Free improvisation of pitch motives as developed.
- 5. Double bass calls the end of the piece by bowing up to the NUT and slackening E string.



General Pitch Direction Model

General <u>Pitch Direction</u> - Improvised slow stepwise motives permitted within general circular direction. vocal plateau, a constant wth emergent strands, a constant with diverse timbral articulations, an accompaniment to other material, a drone spread through space, a harmonically functioning continuum, and an adjunct to a more diverse piece.

Yet generally the drone ensures a single pitched constant tone. It has a function which reinforces continuity rather than change by working as a glueing device against the possibility of fragmentation through silence. In most of the discussed pieces it has formed a musical plateau. As a unit of long duration, it allows for the perception and study of its particles, the fundamental and the overtone series and the relationship of every part of the musical fabric to the drone. It is a reductionist measure readily taken up by composers interested in minimal music, repetition, constant focus and heightened perception.

CHAPTER 4

REPETITION AS UNIT REITERATION AND RESTATEMENT

This chapter considers repetition as the rearticulation of a unit, large or small. The first part of the chapter is a discussion of the differences between unit repetition and the repetition by continuation which is characteristic of drone music. In part II of this chapter which deals with pulse, the repetition of this micro unit is generally referred to as reiteration. In part III which deals with the macro level, the repetition of larger musical units is referred to as restatement.

I Relationships between the Pulse and the Drone

In drone music, repetition is achieved through the extension of a single pitched input over long duration. The natural ability of an instrument to sustain is extremely important in the realisation of drone music. The length of the decay time of a sound comes under close examination. Long bowings and dovetailed breath-lengths have been employed to effect drones. The piano is mostly used with the sustaining pedal depressed throughout while electronically modified instruments or sound sources are ideally

suited to drones.

The point at which a restatement of the initial stimulus is required to maintain a drone function is reliant upon the idiomatic features of the instruments used and it is this feature which often controls rhythmic placement in a larger duration span. 'Decay pieces' are interesting in defining the point at which drone by continuation or drone by re-articulation can in fact be used.¹ If silence is not required and the note has decayed, then another attack is mandatory.

A pulse consciously utilizes the space between sounds. It relies on the regular equidistant spacing of a single input and could be thought of as a fragmented drone. Slow decay pieces such as Thomas Miller's <u>Sentinel Night</u>, 1973, exemplify possible ambiguities in trying to distinguish between pulses and drones. The point at which regularity of restatement (the pulse) is distinct from the re-articulation within a sound to avoid silent space (the drone) is often difficult to define. Miller's piece bears both elements, perpetuation without interruption and regular restatement of an intermittent sound. Chords of A major are sustained throughout the piece with the use of the pedal but when different configurations of the chord are required, the new voicing is articulated.

¹'Decay Pieces' as defined in Chapter 2 generally proceed by the spacing required for the natural time decay of sound to silence. Early pieces in the 1950s pioneered this work, particularly Morton Feldman's King of Denmark.

The slow tempo marking of the underlying crotchet pulse at =63 gives a background regularity to this slow moving piece. Performance details of the touch of the player in re-articulation and the acoustic by-products of the continued use of the pedal, would play a great part in the perception of this piece as pulse or drone music.





The image of a circle being a joined series of smaller points is relevant here. Drones and pulses bear similar relationships. They can both work in the service of continuity and discontinuity depending on

²Published in the Anthology <u>Soundings 7-8</u>, ed. Peter Garland, (Washington: Garland, 1973), pp.6-7.

the context and the perception of the listener. More usually they work towards familiarity and stasis which are experiential states of continuity.

The Australian composer Anne Boyd works with the time-dependent ambiguities between pulse and drone in her solo piano piece Anklung, 1974. Slow reiterations of constant pitches can be perceived as a drone relating to the same fundamental for large sections of the piece. The rhythmic aspect involves slow pulses of groups of notes which elongate towards the end of the piece. An example of the ambiguity between drones and pulses, between continuity and change, is in the central section of the piece. The pulsing drone of B^b which is present in every crotchet beat from pages 3-6 is most notably constant in the notation. Audibly it is a mirage upon which glistening flickers appear and disappear. Well into the second half of the eleven and a half minutes, it seems that the centre of listening has become enlarged so that the decay of sound particles, their adhesion and separation can be fully perceived. Successive hearings of a recorded version or comparison of different performances raise questions concerning the identity of the piece as defined by its notation. Notation, performance practice and perception all seem under microscopic review.



Ex.4.2, Anne Boyd, Anklung³

³Anne Boyd, <u>Anklung</u>, for solo piano, (London: Faber, 1976), p.4.

II Micro Units, The Pulse

A pulse is a regular rhythmic unit involving re-articulation and equidistant space between appearances. This type of repetition, which will be called reiteration is at a micro level of composition, that of motor rhythm. The constancy is time dependent and often carries with it other parametric constants such as a single pitch or uniform dynamics. Every metronomic indication implies a pulse at a certain speed and this device has been used for centuries as a performance aid in achieving vertical synchronization between players.

Since 1960 the pulse has been reconsidered as focal subject matter for music in quite a different way. Perhaps the first use of the pulse as foreground material was by La Monte Young in his piece <u>X for</u> <u>Henry Flint</u>, 1960. The economical verbal model instructs a performer to repeat a loud, heavy sound every one or two seconds as uniformly as possible for a long period of time. Instrumentation is unspecified. Cornelius Cardew cites a performance of the piece as "repeated loud clusters played on the piano as uniformly and regularly as possible"⁴ while Michael Nyman describes "the most famous performance of which found Young beating a frying pan six hundred or so times non stop."⁵

⁴Cornelius Cardew, "One Sound: La Monte Young," <u>The Musical Times</u>, 107 (1966), p.959.

⁵Michael Nyman, <u>Experimental Music: Cage and</u> <u>Beyond</u>, (London: Studio Vista, 1974), p.123. This piece has often been singled out as an example of Young's obsessive interest in repetition as a single event reiterated <u>ad nauseum</u>. Howard Friend's review of a performance of the piece by Keith Potter described it as "one of those tedious pieces in which the same chord... is repeated in strict tempo as many times as to concern, disturb, amuse, irritate, disgust and finally exasperate any but the most patient or mindless of audiences."⁶

The extent of repetition is so rigorous in one parameter that it challenges both performer and listener to come to terms with continuity and change, sameness and variation. John Cage was quick to realise the importance of such a stance when he said of Young's music in 1962,

I've had actually different experiences of listening than I've had with any other music. ... I discover that what I have all along been thinking was the same thing is not the same thing after all but full of variety. I find his work remarkable almost in the same sense that the change of experience is when you look through a microscope. You see that there is something other than what you thought was there.⁷

Historically, <u>X for Henry Flint</u> stands as one of the earliest pieces of repetitive music to redefine a periodic beat in music, thus emphasizing regularity. This factor had been absent in much of the

⁶Howard Friend, Concert Review, November 11, 1971, St. Francis Hall Birmingham, <u>Contact</u> 3, 1971, n.pag.

⁷John Cage,"Interview with Roger Reynolds, in Elliot Schwartz, Barney Childs, eds., <u>Contemporary</u> <u>Composers on Contemporary Music</u>, (N.Y.: Holt, Rinehart and Winston, 1967), p.347.

indeterminate music of the Cage generation especially in the 1950s. This music had been working to unfix constants, predictability and regularity so that sounds could exist separately and aperiodically against a free, clean space. The interest in repetitive music was precisely how to replace it and allow music to proceed by similarity with certain predictable features. Small scale variation could then be perceived within strictly imposed limits almost as a by-product of the central concern.

Michael Nyman acredits Terry Riley with "the installation of regular pulse into experimental music."⁸ It is true that Terry Riley's In C, 1964, commonly regarded as one of the masterpieces of the repertoire, is an early example using a constant pulse throughout. While the 53 figures are closely worked through by the improvising ensemble, the high C on the piano maintains a constant pulsing. The fast pulse infuses the piece with high octane energy. Notes to the record indicate that the pulse, which is the rhythmic spine of the work is not included in the score. "Not included in the score is a piano part, called the pulse, which consists entirely of even octave eighth notes to be drummed steadily on the top two C's of the keyboard throughout the duration of the performance."9 The score is a model like a map to be wandered through

⁸Nyman, p.45.

⁹David Behrman, "Notes to Terry Riley's In C", Columbia Records, MS7178.

individually. It is not explicit in the vertical intersection of sound. Only the pulse is explicit and controls the ensemble as an audible cueing device, providing a stable point of contact in terms of the note-to-note progression of the ensemble through the pitch modules.

The reiteration of the two high C's an octave apart throughout the piece functions as a high pulsating inverted pedal and as the piece progresses, the overtones accumulate particularly when there is substantial octave doubling by the ensemble. Thus the timbre of the pulsing drone changes according to the context but its content never does. Pitch, tempo, duration and dynamic are constant throughout.

In all of Riley's work whether for solo or ensemble, an ongoing pulse is fundamental to the ebb and flow of the pitch motives. It is not always stated so boldly as In C and not always fast, but it is present in pieces like Keyboard Studies, Sri Camel Trinity, Dorian Reeds, and Rainbow in Curved Air. It is a welding constant of non-mechanical fluidity. Riley's attitude to the pulse is compositional, physical and biological. It is a composer-performer's attitude. For him it functions as a chemical timing centre which allows the constant imagination flow necessary for real time composition in improvisation. Riley spends a great deal of time settling into the perfectly adjusted biological flow which he feels is exactly appropriate to his intuitive senses.

Riley's scores are rarely accessible and if they are, usually consist of the briefest instruction and odd little groups of related pitches. In real time performance these are hinged and multi-tracked using a constant pulse as the glueing device, a glue which allows freedom to accelerate and retrack. It is Riley's skill as an improvisor which completely processes the scant mental and notated models through to their hypnotic conclusions. The pulse is important but the magic of the final result will be given closer attention in Chapter 7 where several works will be studied in more depth.

Much simpler is Philip Glass's rhythmic pulse piece <u>1+1</u>, 1968, for amplified table top and one player. It is based on any combination of \neg and \checkmark to be integrated and combined by the player in strict regular arithmetic progressions. The tempo is fast and the beat constant so that the concept of the quaver as pulse, divided or not, occupies the entire content of the piece. The proximity of the divided and undivided pulses to each other gives a feeling of movement together with subsidiary resonant effects of the amplified sound source.

Constant reiteration of micro elements of a piece, its motor rhythm, has been used as a binding force in probably at least half of the pieces which can be called repetitive.¹⁰ Glass makes every note

¹⁰See Appendix A for the occurrence of pulse in the works selected in this study.

Ex.4.3, Philip Glass, 1+111

any table top is ampitico by means of a contact
Mike a malifier and speaker
The player performs 1+1 by tapping the took top with his finders or knurkles
The following two rythmic units are the building <u>blocks of 1+1</u> :
a.)
itl is realized by combining The obove two
UNITS in continuous, regular arithmetic progressions <u>Examples of some simple combinations are s</u>
The tempe is fast

The length is determined by the player

essentially equal with no concept of barring. Strong and weak beats are not relevant, only long and short. A constant pulse at the micro level leaves the composer free to superimpose the concept of stress or accent in new ways defined by the musical concerns of pitch sequence and contour, arithmetical patterning or instrumental differentiation. The pulse is a constant, working to achieve predictability of at least one aspect of sound by providing regular measurement of time passing. It provides a stable backdrop against

¹¹Nyman, p.47.

which longer and shorter notes can be perceived as rhythms which reinforce or diverge from the beat.

Howard Skempton's <u>Drum No. 1</u>, 1971, is similarly fixed in its strict minimal adherence to the pulse as musical material. The brief verbal model only defines timbre to some extent, and the treatment of pulse through time. Everything else other than those minimal restrictions is left to the performer/s.

> Any number of drums Introduction of pulse Continuation of pulse Duration through emphasis, decoration, contradiction.¹²

The subject of the piece is solely concerned with the beat. The instructions define that it is audible and familiar, that it lasts and impresses its familiarity. The micro beat can be shaped through emphasis to give the allusion of different time lengths. Some possible ways of emphasis would be through orchestration, accent and articulation. Aspects of the treatment of the pulse in units imply rhythmic groups set up, prolonged and then changed or contradicted. Although the piece first appears to be minimal and lacking in material, when treated imaginatively in real-time by a group of drummers, the realisation could be quite complex.

¹²Howard Skempton, Drum no.1, in Scratch Anthology of Composition, (London: E.M.C., 1971.) p.13.

Martin Bartlett's Attempt 1973, uses the idea of pulse as the primary subject of the musical content to the same extent as X for Henry Flint utilizes a regular act. The piece differs in that multiple relationships to the pulse are possible. The piece is scored for two or more instrumentalists and electronic synthesizer or metromomes. An even pulse train is to be set up from .05 to 5 cycles per second and then a second pulse, very close to the first but with a different timbral formation, is to be added. As many pulses as desired may be set up. The composer indicates that "the instrumentalists are to direct their attention to one or other of the pulses and play single notes in exact rhythm with it."13 When this is achieved or at a moment chosen by the performer, they can then go on to multiply the pulse frequency by two, thereby playing every half pulse with a second pitch or timbre. The subdivision of the beat may continue to be divided by 4 or 5 or whatever. If the instrumentalist gets out of time he must stop and return to single notes. Once the attention for one pulse has been extended, the instrumentalist should transfer the attention to the other pulse. With two or more slightly non-synchronized pulses, this centre of attention is very important in fixing the instrumentalist to one constant and being able to work

^{1&}lt;sup>3</sup>From Bartlett's notes to the score, in Educational Anthology, ed. Gavin Bryars, (London: E.M.C., 1973), p.32.
individually within that constant securely against all other sounding material. Once this listening centre is achieved, Bartlett encourages the performer/s to be adventurous against it:

Use the pulse as the foundation for as many rhythmic complexities as you are capable of... afterbeats, compound rhythms, longer cycles containing mixed groups of 3 and 2 syncopations, changing phase relationships and so on.14

The move towards complexity depends on the performer's perception and choice in listening to the small pulse units or fabricating more elaborate configurations against the individual pulses.

The formal structure of the piece is wrought through this attention to the pulses at many levels. Simultaneous performer choices process the pulses through time and craft the piece. The pulses are the essential point of contact for the players as well as providing the basic stuffing for the musical product. The pulse works as a building brick which follows its own assembly rather than being shaped by pre-set ideas or concepts which could dictate its placement.

The pulse is not always treated as the single focus or driving force in a piece. Gavin Bryars uses the pulse as one of a number of important elements in his composition, <u>Ponukelian Melody</u>, 1975. In this work, the pulse is a planned component which is clearly audible, and predictably in the foreground throughout. The slow tempo seems to enlarge the dogged nature of accented strokes.

14Ibid.

..its implacable slow beat and uniform crotchet rhythm... The only gaps in the steady one-soundper-crotchet occur at the points where pages have to be turned and a measured rest is given to all performers.15

However, this point alone is far from being the guiding compositional force. Bryars' investigation of Duchamp and Satie has endowed him with a love for eclectic mosaic and assemblage often entirely concerned with past events.¹⁶ <u>Ponukelian Melody</u> draws its slow tempo and thumping rhythms from Satie's 'Les Pantius Dansent' (1913) and the fragmentary compositional process from Satie's Rose + Croix Notebooks'of 1890. Bryars describes the process of composition as follows:

The various phrases were composed independently and were fitted into the score (which consisted of 160 blank bars - not counting repeats) as they were written, each remaining in its original place without revision; the process was like putting together the fragments of a mosaic... until the score was full.¹⁷

The title is derived from Raymond Roussel's novel, <u>Impressions d'Afrique</u>, Paris, 1910, set in the imaginary town of Ponukélé. The musical images which evolve in some way reflect this extra musical connection:

...shipwrecked passengers of the Lycee wile away the time waiting for their ransoms to arrive from France

¹⁵Gavin Bryars, "Satie and the British" Contact, 25 (1982), 11.

¹⁶Bryars is quick to acknowledge these influences and his accounts of them in the above article and "Berners, Rousseau, Satie" <u>Studio</u> <u>International</u>, 192 (1976), pp.314-18 are interesting studies in themselves.

17_{Bryars}, p.11.

to pay the King, Talu VII Emperor of Ponukélé and the king of Dreichkaff, by forming the 'Club des Incomparables' who organise a remarkable gala in the Place des Trophées, the main square of Ejur, the capital.¹⁸

Apart from the nostalgic use of a Romantic source and the suspended sense of time eclipsed for the shipwrecked passengers, it is hard to equate the compositional process with the audible result. Nostalgia and stasis are essential to the piece but the impact of repetition is immediate in the following ways. There are rhythmic groups of 4 and 8, the repeated pitches of the organ, the small oscillating two-note motives of the cello, the persistent rising scales of the tuba, sectional phrase repeats, imitation between players and unchanging dynamic level. The incessant throbbing of the piece is almost moronic. It is highlighted by the periodic stops which jolt the consciousness, giving time for a critical reflection on the constant funky massage of the piece when pulsing. The compositional process as described by the composer and the sounding result are not overtly linked as they were in the previous example. The use of the pulse is one contributing element to a wide range of remote influences and connections, peculiar to Bryars alone.

The above examples have shown how the pulse has been used in repetitive music. It has been the sole musical information, an element for improvisation, a

¹⁸The composer's notes "Recent English Experimental Music", <u>Audio Arts Magazine</u> 3 Number 2, Side One.

point of contact for potentially complex real time composition and a single component of a broader compositional conception. The pulse gears the repetition at the level of a basic time unit.

III Macro Units, Repetition as Restatement

Macro scale repetition, here called restatement, pertains to more formal aspects such as overall structure, sectional divisions or repeats, use of extended harmonic formulae such as passacaglia and ostinato principles, variation techniques and large scale imitation. Repetition of these types has been used in nearly every musical tradition and this repertoire is no exception. An entire piece may be repeated from start to finish with no change. In Chapter 3, La Monte Young's conceptual repetition of the act of composition itself was documented with reference to the same piece, Compositions #10, 1960, throughout 1961. Paul Chihara's work Nocturne, 1968 is a piece which is played through at least three times for one performance. The notated music involving drones and repeated motives for twenty-four solo voices lasts about three minutes but with the ensuing restatements, a performance lasts a minimum of nine minutes. It could be much longer according to how many repeats are chosen.

Bryars' major early work <u>Jesus' Blood Never</u> <u>Failed Me Yet</u>, 1971, utilises the repetition of the entire musical material as a formal basis for

processing. Bryars has recorded the poignant singing of a tramp's evangelical message and made a tape loop of it as a basis for a 30 minute piece. As a model for the piece, the magnetic tape freezes the musical attitudes of the tramp throughout - the rhythmic and melodic tentativeness, pathetic quavering and unstable timbre of the voice. The score published separately but also printed in Soundings 9, June 1979, consists of fourteen bars of fully orchestrated music written with alternate first and second time endings. After the voice part (A) instrumental parts are written for flute clarinet and bassoon (B), horns (C), trumpets, trombone, tuba (D), oboe, glockenspiel (E), violins, viola and cello/bassoon (F), bass and/or guitar (G), harp (H), organ (J), vibraphone and/or celeste (K). In notes to the score, Bryars indicates that the groups are to enter one by one after several repetitions of the voice alone. Their entries should be smooth and equally dispersed throughout. The dynamic should be stable at mf, the voice must be clearly audible at all times.

The solo voice tape lasts approximately 30 minutes (though longer versions may be made) and so, allowing for at least 2 to 3 minutes for a very slowly faded ending, the last group should enter at about 24-25 minutes into the performance, and the first at about 3-4 minutes, the rest fitting between these points. ...While there is no real need for a conductor, it is helpful to have one person responsible for indicating to a group when it is due to begin.

19Gavin Bryars, Jesus' Blood Never Failed Me Yet, in Soundings Nine, ed. Peter Garland, (Washington: Garland, 1975), n.pag.



The score itself is an arrangement of a simple chordal accompaniment Bryars worked out at the piano. Minimal changes to the simple chords give a directionless quality, a static endlessness as the additive orchestra makes no significant change, only a slight timbral expansion, a successive swelling of the homorhythmic harmonic underpinning. Only the pizzicato quitar, bass and resonant harp have independence with their rhythmic motives outside the ensemble chords. Instruments, when entering, merge and blend, giving support to the tramp's plight rather than achieving The performance practice variation or contrast. choices in two versions, the version recorded on Obscure by the Cockpit Ensemble, and the composer's own performance made with the San Francisco Conservatorium²⁰ ensemble on March 21, 1974 ensure this blending texture as both versions work from an established pizzicato string bass immediately filling audible space with a wash of sustained chords.²¹ The Obscure version has the lushness of professional recording technology, and ensemble playing. The addition of the woodwind, horns and the brass is quite audible. In both versions a high pitched woodwind instrument, oboe in the Obscure recording and flute in the San Francisco version, are reserved for later In the San Fransisco tape, the abrupt end entries.

²¹The Cockpit Ensemble, <u>Gavin Bryars</u>, Obscure OB1.

²⁰The private recording of the San Francisco performance was made available by Warren Burt.

seems to stop short as the players put an end to their fade out which never becomes pianissimo. It is as though the tramp must enter and the fact that he doesn't almost causes a painful hiccup of perception so great has the predictability become. In the Obscure version, the recording fader is much more measured bringing the piece softly and safely to its end. The immense emotion in the piece comes from the relationship of parts between the tramp's singing on tape and the human accompaniment. Bryars' linking of the two amplifies the solitariness of the tramp. He is present on tape. The accompanying instruments are like spectators. His tune is the call for each repetition as the two notes on 'Jesus' are sung unaccompanied, an anacrusis of great impact because of the uncertainty of the pause. The notation of the score in 3/4 serves as a guideline, but at no time is there a perceptible metre or a constant pulse. Rather there are longs and shorts in the tramp's deliberations so that the tape really functions as an audible cue. The tramp cues rhythmic changes for the ensemble at major points in the phrase:

Jesus' Blood never failed me vet never failed me vet Jesus' Blood never failed me vet There's one thing I know, for he loves me so.

The circled eight points in the phrase designate the important rhythmic accents and essential points of ensemble attack. Similarly those instruments which have subdivisions of the beat, pizzicato bass,

guitar and harp, need to adapt the principle of spreading out the notes over the actual time space rather than the notated space, particularly in the second last bar.



The rhythmic delay on the first two words 'Jesus' Blood' also serves to make the meaning of the text particularly poignant. In the liner notes Bryars documents that this particular song was selected from a batch of tapes made in 1970 by Alan Power who was making a film about tramps. Bryars' arrangement was later used as a sound track for a 16mm film by Steve Dwoskin in which an old man, filmed at very high speed, walks slowly towards the camera. The film, which is very slow, faint and washed out, is sometimes used with the piece.

By the end of the piece there is no question that the elements sit comfortably together as the texture thickens almost as a musical metaphor of emotional wallowing. Nyman comments:

the found object is gradually 'accepted' into the increasingly sensuous setting - though the earlier instrumental additions obviously have a stronger effect on one's perception of the tune than the later ones, even if on another level one hears the piece as a gradual increasing of instrumental richness, and the original tune loses its initial

central focus.22

As an example of repetitive music it is straightforward; the idea and the material are the piece, so unlike many of Bryars' later compositions. One layer of the piece is repeated and gently processed.

In repetitive music, pieces involving the repeated use of one section are common but the way in which the repetition comes to pass varies considerably.

A much more common occurrence is for a work to be divided into parts or sections each of which may be repeated²³ once or many times consecutively or after other sections, to complete a formal design. Howard Skempton's famous little <u>Waltz</u>, 1970, for piano is divided into four sections labelled A B C D. Skempton defines the order in which they are to be played to form something ressembling an extended rondo form with irregular repetitions.

ABAAA. CDBDC. DBDBA. AABAB

DABCA . BDCAB

Section A occurs 11 times, B 9, C 4, D 6. The sections follow one another without a break, swinging along to the 3/8 metre which is reinforced naively by the rhythm to give the air of a simple rag. Skempton consciously

²²Michael Nyman, "Hearing/Seeing" <u>Studio</u> <u>International</u>, 192 (1976), p.226.

²³One is immediately reminded of dance forms in the renaissance and baroque where the repeats were an invitation to slight variation through performance variation in dynamics, articulation and ornamentation.



²⁴Keyboard Anthology, (London: E.M.C., 1972), p.88. uses simplicity not only in rhythm and sectionalization but also in the treatment of melodic line and the simple harmonic progressions which comprise Section D.

There are internal relationships between sections in this work. The harmonic foundation of sections A, C and D are the same, while D comprises the bass line alone. Section B has the simplest 4 bar phrase repeated on IV V I chords. All of the melodies use stepwise motion with the figure being a common motive in section A occurring eight times in 16 bars. The use of the chromatic scale in section C rising from C to E and descending B^b to E is purposefully placed but has the effect of a stalling device rather than being goal directed.

The division into sections with repeats and the internal musical relationships between sections points to the single minded use of repetition in this work. The composer's intention is quite clear:

it reveals an appetite for the extension of a single sound, in this case a major tenth... it is entirely devoid of cleverness. The predominant quality is purity, frequently seen as a mixed blessing, but arguably basic, like sincerity.²⁵

Nyman has pointed to the feeling of a "new tonal flatness"²⁶ in the work due to the connection of the harmonic and melodic sequence while Bryars has seized on the extensive use of repetition in the piece despite its short length. He writes of the perception

²⁶Nyman, p.145.

²⁵Howard Skempton, Notes to 'Waltz' in <u>Audio</u> Arts Magazine, 3, no.2, (1976) side 1.

of time and change in this simple almost corny piece:

an eight minute piece which is both wholly predictable and very surprising at the same time partly because of the extreme banality of the materials and partly because of the feeling of disbelief induced by such forms of repetition. The Waltz gives the lie to the idea that extended repetition is possible only over extended periods of time... a piece lasting only a few minutes can be hypnotically repetitive without becoming tedious.²⁷

The approach to sectional repeats and repetition established in this piece was also common to many other works by Skempton, notably <u>One for Molly</u>, published in the same collection, as well as works by other English composers. Small pieces such as these from the early seventies abound in collections published by the Experimental Music Catalogue. Bryars sums up the English preference for this use of repetition in works which "involve the listener in a kind of constant interior dialogue."²⁸

Naivety and romantic sentimentality, and the familiar and predictable repetitive patterns make these pieces undeniably English in style. While Skempton's pieces were often set compositions, other English groups and composers applied repetition by restatement from a slightly different point of view. Pieces by Robin Mortimore and the Majorca Orchestra show that the number of sections was not always many and that their application to repetition often involved variations. In the case of the following selected pieces, those

²⁷Bryars, "Satie and the British," p.9.
²⁸Bryars, p.9.

variations pertain to orchestration and role as the following table outlines.

TABLE 4.1

Sectionalization in Pieces from The Majorca Orchestra

Volume One²⁹

Composer	Piece	No. of Sections	Form	Orchestration					
R. Mortimore	Mediterranean Waltz No.l	1 (X2)	AA	cls + vlns lst occurence oboe + flutes 2nd A					
	'Marylands' Tune No.3	3	AA,B ₂ BB,B ₂ CC,C ₂	divided instrumentally					
J. Lampard	The Darkies The Caterpillar	3 4	ABCCA A, A+B, B, B+C, C, D	constant					
	The Butterfly Waltz	2 sections 3 accompani- ments	A,A,A, B,B,B,	each statement instruments change roles.					
	The Great March	2 tunes & accompani- ment	tutti AB tutti A,B, tutti A ₂ B ₂	changing					

These compositions conform to the format described by Bryars. They are simple tonal works which attain their non-directionality and flatness through the repetition of each of the internal sections and changing roles of the elements of one section. The

²⁹The Majorca Orchestra: Volume One, The Early Compositions, (London: E.M.C., 1973), pp.1-16. interest is in the way the pieces are orchestrated according to the available personnel and instruments. The division of labour becomes the audible subject of the music. As the different instruments change roles moving from line to line in different configurations, the musical material undergoes slight change as certain timbres tend to submerge or pronounce the elements in different contexts. In every way these pieces are functional music, shaped as repertoire for the band with a particular kind of interest, spirit and skill.

Even greater freedom towards repetition by restatement exists in Hugh Shrapnel's <u>Lullaby</u>.³⁰ This piece calls for extended <u>ad lib</u> repetition of its three sections. This slow and gently sustained piece uses repetition intentionally to mesmerize and induce sleep.

Considering the English pieces in a group, the amount of continuity obtained through repetitive use of sections varies a great deal. Redundancy and continuity cannot be assumed. The content of each single section, the frequency of its occurrence and its role need to be considered within the context of the individual work.

Harmonic Grounds

Harmonic grounds, are the basis of another frequent repetitive technique. A ground is a harmonic progression of fixed length which functions as a unit.

³⁰Keyboard Anthology, p.85.

Familiarity and regular sequencing facilitate audibly repetitive results. The incidence of grounds in English New Music is quite prolific. Composers such as Gavin Bryars, Michael Nyman, Christopher Hobbs, and the various orchestral ensembles have seized on them as accessible repetitive techniques. English music is often concerned with tonality over extended time spans and grounds have been found to be extremely suitable to this end. Considered as sections for restatement, grounds can define the structure of a piece although they may be applied as one of a number compositional tools.

Grounds and sectional repeats have been used by many American composers as well as English. John Melcher's <u>Parlour Music #1</u>, 1977 is similar to the English pieces in its blend of interlocked motivic repetition and structural sectional repeats. It is a piece which places considerable demands on the performers as the tempo is fast \downarrow = 96-132 and set relationships of 11 and 14 quavers have to be reconciled. The sections are important signals to the performer as they mark the point of convergence as the eleven statements of fourteen quavers (14/8 X 11) and fourteen statements of eleven quavers (11/8 X 14) make one cycle of the same length. In this piece the sections have roles which are interdependent.

The performers need to keep a log of the number of repetitions as they are happening, as well as paying attention to the detailed articulation patterns of

slurs, staccato and accented notes. This sectional repetition is more than a compositional device. It is part of a performance process upon which the audible repetition hangs.

Ex.4.6, John Melcher, Parlour Music #1³¹





³¹in <u>Ear Magazine</u>, 4, No.7 (1978), p.1.

The use of sectional restatement is not always obvious, consistent or patterned. Bob Davis' <u>Round</u> <u>Sugaree</u>, 1973,³² has repeated sections which provide continuity and change. The continuity of the sections is preserved in pitch, rhythm and texture, but their vertical intersection through canon and imitation provide variation. Ed Fulton's <u>Piano Piece</u>, 1973, uses multiple forms of repetition of units, large and small in a quite capricious way. There are detailed repeats of bars of different length, prolonged repetition of one sound for ten minutes, yet the use of silence and the sectional repeats are left to the performer's choice. It is a potpourri of different forms of repetitive units strewn together. (See Ex.4.7)

Repetition by reiteration and restatement is varied both in its use and audible effect. The works discussed here show how different composers and performers employ these forms of repetition to different ends in different contexts. Sometimes the units are small and repeated so many times that they are heard as points or cycles. When the sections are longer and/or the content more varied, the continuity caused by the repetition may not be so immediately observable. The diagnosis of whether the repetition works for continuity or change is complex just as variation is similar to and different from an original. Repetition of units large and small is an extremely

^{32&}lt;sub>Educational Anthology</sub>, (London: E.M.C., 1973), p.24-5.

Ex.4.7, Ed Fulton, Piano Piece³³



5. This section is free - anything may be played, improvised, but no theadrics or visual effects. No reference to 2.!

After the sections have been played, repeated and for omitted, the coda follows:



important device in repetitive music. It pervades every section of the construction of music from the pulse to motive, from individual part to total texture, from one section to the entire piece. All have been considered units for repetition in the works discussed.

³³Keyboard Anthology, p.26.

CHAPTER 5

LENGTHENING AND SHORTENING PROCESSES: ADDITION, SUBTRACTION - AUGMENTATION, DIMINUTION.

The principle of addition is an obvious concept as a repetitive device. Mathematically it implies a systematic relationship of ordered units. Generally it conjures up expansion and accumulation. For music, 'addition' may apply to pitch, rhythm, melodic units, phrases, harmony, textures, sections or overall structural devices. Several of the pieces already discussed have employed additive processes in varying degrees of rigour and application. La Monte Young's X for Henry Flint, 1960, and Philip Glass's 1+1, 1968, are both exclusively additive rhythmic pieces, the first aiming at proceeding by similarity, if not replication, the second by slight variation emerging from various combinations of two small rhythmic figures. Chris Hobbs, Gavin Bryars and Bob Davis have applied the notion to orchestration introducing players one by one to build up a rich expanding sonority. Boyd's Anklung loosely applies addition to pitch and registration.

However, the person to champion the notions of addition and subtraction with the utmost rigour over a

long period of time was Philip Glass. He has used sequential additive construction as a systematic structural device in all of his work from the outset, even before <u>1+1</u> in 1968. It provided a non teleological means of patterning sounds through time. In a programme note to <u>Music in 12 Parts</u>, 1974, he sums up his concern for time scale in the following way:

The music is placed outside the usual time scale, substituting a non-narrative and extended time sense in its place. It may happen that some listeners, missing the usual musical structures (or landmarks) by which they are used to orient themselves may experience some initial difficulties in actually perceiving the music. However, when it becomes apparent that nothing happens in the usual sense, but that instead, the gradual accretion of musical material can and does serve as the basis of the listener's attention, then he can perhaps discover another mode of listening, one in which neither memory nor anticipation (the usual psychological devices of programmatic music, whether Baroque, Classical, Romantic or Modernistic) have a place in sustaining the texture quality or reality of the musical experience. It is hoped that one would then be able to perceive the music as a 'presence' freed of dramatic structure, a pure medium of sound.¹

Glass's use of the additive process gave him the freedom to control time scale in the way he wanted. From the outset he chose the basic unit of a quaver as a background time length against which groups could recede and emerge unpredictably. His music involves a high degree of similarity of musical material from several points of view, pitch, harmony, rhythm, and the lack of any recurring accents which are immediately apparent in barred music. All of the listener's perception can then be focused on the linear assemblage

¹Philip Glass, Notes to <u>Music in 12 Parts</u>, Virgin Records, CAZ010, 11974.

of units, skillfully manipulated by the composer.

The characteristic way in which Glass does this is evident in the very early piece <u>Strung Out</u>, 1967, for amplified solo violin. Unbarred traditional notation sets the basic unit as a and defines the harmonic limits. The opening figure is a lst inversion C maj triad and 7th:



This series of pitches is firmly secured in the ear in various additive configurations for the first three pages of the piece.

The first two notes are repeated in the very next figure:



and the C has been dropped to be taken up in the following figure.



The first group is 5 notes, grouped 2+3, the

second 6 notes, 3 lots of 2. The third is 7 notes, 2 groups of 3+4. At least two thirds of the modules on p.1 (18) begin on the pitch E, while 12 begin on C. It is the last part of the first motive which is treated in rhythmic expansion. The first module uses ascending and descending directions as well as movement by step. These elements are important stylistic devices in Glass's work and are deliberately used to excess even in this early piece. However, the grouping of notes into different lengths and the bowing articulations give just enough interest and the ear tends to scale down to perceiving smaller variation patterns. Minimal and slow changes have impact as static dynamic, harmonic and timbral elements are pursued.

The addition of new pitches into the expanded first figure comes almost as a shock. The structural pitch additions can be seen from table 5.1. The pitches are added in subtle ways, and grafted into the established material. The final arrows at 15 indicate that the entire pitch range is involved in rhythmic treatment in continuous ascending and descending scales. Despite the rhythmic dislocation in pages 3 and 11, the rigorous repetitive drive is already establishing itself in Glass's music. So too, is the incredible energy required by the performer to persevere through the varied rhythmic/melodic permutations with little or no time for rest. It is a performance activity based model that is finely made.

This early piece, has a higher degree of

TABLE 5.1

Pitch Addition in Strung Out, Philip Glass²



Fragmentation due to the addition of rests, subdivision of the beat and triplets.

1 2 = 2 Cycles to be played on the repeat of the work 8-10 times each and then figure 2 alone 8-10 times to finish the piece.

contrast when compared with later more single-minded pieces using additive rhythmic construction. Da Capo indications and cycles in the bass are used. Glass was to return to sectionalisation and cyclic procedures in pieces such as <u>Music in Changing Parts</u> and <u>Music in 12</u>

²Philip Glass, <u>Strung Out</u>, Dunvagen Music Publishers, 1967. Parts, but from <u>1+1</u> his preoccupation was with applying additive processing.

Glass saw the fundamental difference between Eastern and Western music in the principles of construction by addition in the east and division in the west:

What I noticed about western music was that for the most part western music takes units of time and divides them. ... And in fact measures are things ... which you divide. Well with Indian music what I discovered was that they take a much longer unit and they work from adding from the smaller units.³

It was this observation which inspired him to work from small figures which would be repeated and then move on to the next figure, the music being the sum of all the individual melodic units.

When I write out the score, then there'd be forty figures, sixty figures, eighty figures. Now each figure is related to the next figure, at least in that early music, by the addition and subtraction of one musical unit. So that there would be a figure that had five eighth notes in it. And then the next figure would have seven, the next would have eight. Very, very simple. ... At the beginning I used this very, very simple completely ah systematic approach. .. But what I found was that the feeling would change very much between the feeling of five, the feeling of six, the feeling of seven. And so that what I worked with as a composer was finding musical figures for the units that would work within that additive structure in the most musical way possible.

The titles of <u>1+1</u>, 1968, <u>Music in Fifths</u>, 1969, <u>Music in Similar Motion</u>, 1969, <u>Music in Contrary Motion</u> overtly summarise the intent of the composer in applying additive construction in different ways. Dave

⁴Ibid. p.111.

³Phil Glass in interview with Walter Zimmerman in <u>Desert Plants</u>, (Canada: A.R.C., 1976), pp.110-11.

Smith discusses these early pieces systematically, showing how Glass became more preoccupied with texture rather than structure.⁵ It is also noteworthy that the earlier pieces were all solo music allowing for maximum focus on the minimum event such as the Shandar release "Solo Music" with the pieces Contrary Motion, 15'30 and Two Pages, 17'. The spirit of these pieces was taken over into the ensemble. Glass treats a single line so that it resembles counterpoint through the use of repetition, articulation and registration. His shift from solo to ensemble music was hardly surprising. After returning from studying additive and cyclic techniques in India with Alla Rakha in 1966, Glass worked on establishing an ensemble of expert musicians, initially 2-3 electric organs, saxophones, flutes and later, cello, trombones, violin, electric piano and voices. The grouping of notes and motives was then shared between the ensemble who had similar or dissimilar roles according to the piece. In Music in Similar Motion, 1969, 2, 3 and 5 part textures appear but all the parts move in a homogeneous way. Rhythmic and harmonic elements are fused so that similar motion is preserved. When notes are added or subtracted the entire ensemble observes it. It is worth noting that subtraction is often referred to as part of the additive process by Glass in later years. However, 1+1 and Music in Fifths only use additive

⁵Dave Smith, "The Music of Phil Glass," <u>Contact</u>, No.11 (1975), pp.27-33. techniques. <u>Music in Similar Motion</u> is the first piece to use a subtractive process. The subtraction serves to curtail a figure which may be coming predictable thus giving a jolt or change by shortening the motive.⁶

In <u>Music with Changing Parts</u>, 1970, and <u>Music</u> <u>in Twelve Parts</u>, 1972-74, <u>Another Look at Harmony</u>, 1976, and the operas, additive and subtractive processes abound in different sections and different layers.⁷ However the sequencing is almost always clearly audible, being presented in loud dynamics, clear orchestration, and simple linear processing. As Glass's rhythmic and melodic processing is dependent upon the processing of time the greater the number of processes used, the longer the works. By using minimal changes over long periods, psycho-acoustic by-products of drones, singing tones and harmonics can be perceived to add a shimmering effect on the musical material.

Another composer to use additive and subtractive processes rigorously in the late 1960s was Frederic Rzewski. In his <u>Les Moutons de Panurge</u>, 1969, the notated pitches accumulate methodically from 1 to 65 as the players move through the pitches in the performed sequence - 1, 12, 123, 1234. (See score, Ex.5.1) Rather than being a composed additive process, the sequential addition and subtraction is superimposed by the performers in real time.

⁷Smith, pp.27-33.

⁶See Record Notes "Music in 12 Parts", Virgin Records, 1974.

Les Moutons de Panurge FRLMDP47 For any number of musicians playing melody instruments plus any number of non-musicians playing any-9 10 11 12 13 14 15 Thing 4 5678 1 2 3 MUSICIANS Begin ca 5=150 -accelerate to car = 300. Sempre of (use a 33 3+35 21 22 23 24 24 18 20 25 27 28 29 30 51 ATT P 54 55 56 31 39 40 41 42 43 44 45 46 47 48 49 50 52 53 57 FH J All in strict unison! 57 58 59 6 61 62 63 64 65 3 octave doubling allowed -If at least two instruments in each octave. Read from left to right, playing the notes as follows: 1, 1-2, 1-2-3, 1-2-3-4, etc. When you have reached note 65, play The whole melody once again and than it, then begin an improvisation using any instruments. In the melody above, never stop or falter, always play loud. Stay together as long as you can, but if you get lost, stay lost. Do not try to find your way back into The fold. Continue to follow the rules strictly. Non-Musicians are invited to make sound, any sound, preforably very loud, and if possible are provided with percussive or other instruments. The non-musicians have a leader, when they may follow or not; and who begins the music thus: (I=150) ISTSS.... etc. (F sempre). As soon as this pulse has been established any variations are possible.

⁸Scratch Anthology, (London: E.M.C., 1971), p.43. A perfect reading of the process would yield the following structure from the notation.

FIGURE 5.1

Structural Addition and Subtraction in Les Moutons de



One hunderd and thirty statements of the theme or fragments of it are implied in these instructions. In this correct reading, 129 are different configurations of the 65 note melody. The challenge of this piece lies in the numerical sequence and tempo of J = 150 and accelerating to J = 300. There is a tremendous margin for error. "If lost stay lost"⁹ is a directive which will preserve the interior shape and form of the additive and subtractive melody. Error will cause imitation at the rhythmic space of the mistake. For example, if a player lost 2 beats and fell behind, the piece would proceed in imitative

⁹Printed in the score. The origin of the title is from a shepherd called Panurge who counts sheep but keeps losing them.

The performance by the Blackearth Percussion Ensemble¹⁰ is for a variety of mallet instruments, vibraphone, xylophone, marimba and almglocken.

The four players proceed through the unison process perfectly until 3 1/2 minutes into the piece where the regimentation snaps into a crazy canonic The distinct timbres of the 4 mallet imitation. instruments become more audible as the lines become more independent and players vary registration and attack through the piece. This is particularly noticeable at 6 minutes where the processing is up to note 53 and the ensemble adopts soft dynamics. At note 60, two part imitation with the high glock on the top is very marked and picks up the impetus. At 8 1/2minutes the subtracting process begins. More and more the lines become a heterophonic web with instruments receding and emerging. At 14 minutes the acceleration indicated is most marked and at 15 1/2 minutes the

10_{See} Discography.

first player arrives at the end and tremolos the last note until all others have finished. There is no improvisation and no non-musicians as called for in the score. It exists as one performance of the additive process. Other performances could yield quite different results in terms of orchestration, imitation, percussive foundation, articulation and development of the process. Despite the rigour of the addition and subtraction as contained in the model pathway, quite different applications may result audibly.

In Rzewski's <u>Coming Together</u> of 1972, the additive and subtractive process is composed in to the note-to-note sequence of text and accompanying bass part so that the continuity is finite, quite unlike the earlier piece.

Text

The text uses a very simple sequential treatment of repetition. There are eight sentences marked A-H. The first letter is repeated then the second is added. Da Capo of AB; C is added. Da Capo ABC, D is added up to H. When all the text is declaimed, a subtractive process begins in which the first, second, third sentences are gradually omitted one by one from the da capo repeats. This can be seen in the following figure, 5.2.

FIGURE 5.2

Addition and Subtraction in the Text Sequence of

Frederic Rzewski's Coming Together

Text

Sequence

- A: I think the combination of age and a greater coming together is responsible for the speed of the passing of time.
- B: Six months now and I can tell you truthfully few periods in my life have passed so quickly.
- C: I am in excellent physical and emotional health.
- D : There are doubtless subtle surprises ahead but I feel secure and ready.
- E : As lovers will contrast their emotions in times of crisis, so I am dealing with my environment.
- F: In the indifferent brutality, the incessant noise, the experimental chemistry of food, the ravings of lost hysterical men, I can act with clarity and meaning.
- G: I am deliberate sometimes even calculating, seldom emploing histrionics except as a test of the reactions of others.
- H : I read much, exercise, talk to guards and inmates feeling for the inevitable direction in my life.

Addit	ion				<i>></i> -	+		+			+			4	+				+									
Text		A	в	A	в	С	A	В	С	D	A	в	С	D	E	A	в	С	D	E	F	A	в	С	D	E	F	G
Page		1			2			3				4			5							7						8
Score	Cue	A	1 B								C						D											
Text		в	С	D	E	F	G	н	C	D	E	F	G	н	D	E	F	G	н	E	F	G	н	F	G	Н	G	HX2
Page		9		11								13						14	1					10	16			
Score	Cue	Е		F								G						Н										
Subtra	cti	on-				>		•	-AI	3				-1	ABC	2			-1	ABO	CD	•	-Al	BCI	DE		ABO	CDEE

The emergent additive and subtractive structure is very similar to that used in the earlier piece despite its different musical application. The only point of departure aside from the smaller scale is the axis point where addition and subtraction in one sequence happen simultaneously.

FIGURE 5.3

Structural Form in Coming Together

A AB ABC ABCD ABCDE ABCDEF ABCDEFG BCDEFGH CDEFGH DEFGH EFGH FGH GH

Each section of the text is heard seven times. The largest number of the eight sections to be strung together at any time is 7, A-G and B-H.¹¹ The following seven pitches are used:

> G B^b C D F G B 1 2 3 4 5 6 7

This series works in an additive ascending sequence from a root on low G in much the same figurative treatment as that used by Glass.

¹¹The importance of the letter 7 cannot be ignored: pitches, sections, number of statements. Rzewski has 7 letters.

There are seven combinations of the 7 pitches.

- 1 G 2 GB^b 3 GB^bC 4 GB^bCD 5 GB^bCDF 6 GB^bCDFG 7 GB^bCDFGB^b
- All of the pitch material is given out in the first two pages but the rearrangement and permutation of each of the additive figures in general ascending and descending directions is stretched out over time. The seventeen pages of score are divided into five cues as points on a line travelling a course. (See Figure 5.2) Each cue marks specific musical concerns.
 - A Ascending direction enlarges causing larger falling intervals in order to return to the bottom note, a secondary consequence of the process of addition.
 - B Rhythmic placement: A S is removed before the barline for the sequences. With the text "but I feel secure and ready," a static motive based on G B C G, underlines the meaning of the words as a drone.
 - C Descending patterning. Intervals using secondary addition factor become larger. A rhythmic change on G is established on the weak beat.
 - D A high B^b is established as the upper point of stepwise fall. There are many ommissions in the falling figure for it to be a systematic sequence. A static two note motive, B^b-G is



¹²First page of the score. Frederic Rzewski, <u>Coming Together</u>, <u>Soundings 3/4</u>, ed. Peter Garland, (Calif: Garland, 1972) p.45. used to accompany the words 'lost men'.

Е

New permutation. Ascending direction from top B^b Increasing use B^b descending to low G.

From this analysis it can be seen that addition and subtraction work at many levels in <u>Coming Together</u>:

- (1) Text accumulation,
- (2) Pitch introduction,
- (3) Motivic expansion and contraction.

In a letter accompanying the score, Rzewski indicates that accompaniments may also be introduced in an additive rhythmic manner. After the voice is established, instruments may enter with sparse long notes proceeding to notes of medium duration, then moving to shorter fragments. (See Ex.5.3).

The meaning of the text, the tricky repetitive devices and the performance practice effort required to carry out the piece, fuse to convey Rzewski's political intent. He articulates the desired struggle which almost functions as a musical analogy or metaphor to the plight of the prisoner, Sam Melville.

Processes of addition and subtraction are ways of prolonging and shortening time units or of expanding or reducing the number of elements present. So, too, are processes of augmentation and diminution. Being familiar terms widely used to describe musical processes, they generally refer to a single parameter, often duration. In Rzewski's <u>Coming Together</u> the role of the accompanying musicians could be said to travel from augmentation to diminution. This helps to give a
Coming Together¹³

COMING TOGETHER, PART 1

Frederic Rzewski

(from a letter accompanying the score)

The text for <u>Coming Together</u> is taken from a letter written by Sam Melville from Attica Correctional Facility in the spring of 1971. Sam Melville was murdered by the state in the assault on Attica last autumn.

The score for <u>Coming Together</u> consists of a single melody written in the bass clef. There are several ways of interpreting this piece, depending on the number of persons available. The simplest possible version can be done by one person who both plays the melody as it is written and recites the text at the same time. I have performed it this way at the piano. Ideally, however, there should be one person reciting the text and a number of musicians accompanying him in the following way:

One musician at least plays the melody straight through in very strict time on a bass instrument, preferably electric bass or bass guitar. The others do not play at all at first but enter gradually, playing long notes in the beginning with silences between them, then gradually short-ening the durations of the long notes and the silences so that they become notes of medium duration, groups of notes, short melodies and fragments of melodies, and so on. Most of these notes are octave doublings of notes in the bass line which are then sustained for as long as the player wishes before going on to the next doubling. What happens is this, that a number of melodies arises, as many as there are players, the sum of which however is as it were a freely articulated orchestration of the principal melody. In addition, however, the musicians should try to interpolate freely improvised passages that depart from this rule, with the condition that they do not get lost. It is very hard not to get lost, so that to be free in this situation really requires a struggle. As the music approaches the end, the durations become shorter and shorter so that for the last section (say from letter H on) everyone is playing in unison or octaves. Dynamics are free, although basically loud, and a percussion part may be improvised, as long as it helps to keep people together.

Regarding your comment on the pessimism presently affecting American composers, I would only like to point out that, where this phenomenon is manifested, it is usually a trivial and naive pessimism which does not really reflect their long-term attitudes, and it can be corrected by further discussion of the question "Whom are we serving?" in particular, and by further politicization in general. A new stage of revolutionary optimism is now beginning among American artists, I think, although this has to be expressed in concrete actions, and although a certain component of intellectual pessimism should perhaps at the same time be retained. Pessimism is the basic philosophy of the ruling class, for whom change can only be for the worse, whereas for us the prospects for change are good, although this may require long duration and effort.

13 Soundings 3/4, p.44

feeling of intensity and compassion towards the end of the piece as the attacks become closer together and the intervening space is lost.

One of the clearest examples of the use of augmentation is Steve Reich's <u>Four Organs</u>, 1970. After working on his electronic device the Phase Shifting Pulse Gate¹⁴ Reich had the idea that:

if a group of tones were all pulsing together in a repeating chord, ... one tone at a time could gradually get longer and longer in <u>duration</u> until the gradual augmentation (lengthening) of durations produced a sort of slow motion music. ... The tones would simply begin in unison in a pulsing chord and gradually extend out like a sort of horizontal bar graph in time. ... I thought about playing a repeated chord on an organ, and then holding one and then several of the notes down longer. Instead of the common digital clock, I thought of a musician playing a steady pulse with a rattle (maracas) that would enable the organists to count together as they held their notes down longer and longer.¹⁵

This simple process is precisely what the piece is about. It is obvious in the score and easily made audible by the performance process. So many continuums are made constant that the elongation of the chord is pronounced. This is clarified in the following list.

(1) Pulse

Steady unbroken eighth notes establish the beat from the outset in a solo bar of eleven eighth notes. This functions as a constant audible counting reference.

14See Ch.7 Physical/Mechanical Processes.

¹⁵Steve Reich "Four Organs - An end to Electronics", <u>Writings About Music</u>, New York: Universal, 1974, p.25.

(2) Mono timbre

The four instruments, electric organs are identical, being four Farfisa 'Mini-Compact' model four octave single manual organs with a switch that lowers the bottom octave to low E, as the composer describes: "Identical organs should be used choosing identical stops that will produce a clear tone without excess shrill high frequencies and with no acoustical beats."¹⁶ Tuning and amplification details are also given to preserve uniformity.

(3) Dynamics

Forte throughout.

(4) Harmony

The entire piece is a working of one chord, an eleventh chord on E major being the notes

A F# D# B G# E

(5) Sections

Sections called bars each contain one chord. Changes in the length of bars are coded in the following table.

16Steve Reich, Preface to Score, Four Organs, (London: Universal, 1980.)

TABLE 5.2

Augmentation in Four Organs

BAR	1-20	21-22	23	24	25	26	27	28	29
BEATS	11	11	12	15	18	20	23	24	28
ELONGATION +1 +3 +3 +2 +3 +1 +4									

30	31	32	33	34	35	36	37	38	39	40	41	42
30	36	37	44	47	56	68	103	117	159	184	227	265
+6 +1 +7 +3 +9 +12 +35 +14 +42 +25 +42 +38												

The patterning of the prolongation or lengthening of the chord can be interpreted in the graph Figure 5.4 where the horizontal axis codes bars and the vertical codes the number of beats. The spatial spread in the graph is a visual analogy to the lengthening of the chord through time.

From the graph it can be seen that the first 22 bars are concerned with multiple statements of the chord every 11 beats. As the duration of the chords increases substantially the extension of the chord by repetition is not necessary. The sound of each chord continues with the same force because of the sustaining power of the electronic sound sources so that the longer augmentations can be perceived as particular sound lengths. There is no decay. The graph really

Speed of Augmentation in Four Organs



plots ensemble re-articulations of the same chord. Within each bar, subtle layering effects between parts determine the density of the chord through the composer's use of doubling and rests. Despite the subtle nuance of thickness, there is never any doubt as to the nature of the chord or the fact that it is lengthening. Although the patterning of the augmentation is not regular in the way that Rzewski, for example, processes additive and subtractive principles, Reich's use of augmentation becomes the audible subject of the music against the everpresent maracas pulse. It is a simple system intuitively used.

Four organs, as I've said over and over again, was composed intuitively in 1970. I had the process ... in mind, but instead of opening itself out I had to sit down and write out each bar in detail, and use my ear as a guide ... realizing a gradual process through personal choice."

Michael Nyman's <u>Bell Set No.1</u>, 1971, is another piece which uses augmentation but to different audible purposes. He systematically works through the progressive lengthening of a simple rhythm in multiples of quavers by adding quavers to each part of the rhythm. The piece intends to allow the natural attack and decay of bells and resonant metal percussion to be studied. The gradual lengthening shifts the emphasis from initial attack to the idiomatic decay tone of the percussion. Each rhythmic unit is repeated and the piece has four systems to be performed simultaneously

¹⁷Steve Reich, Interview by Michael Nyman, Studio International, 192 (1976), p.300.

while relating to a common pulse. The rhythmic augmentation composed in the model is more rigorous than in the piece by Reich, but the performance processing allows for a flowing imitative rhythmic texture as well as a study of timbre. Other pieces in which Nyman uses additive principles are <u>1-100</u>, 1975, and The Otherwise Very Beautiful Danube Waltz, 1976.

At a structural level Jon Gibson's <u>Melody</u> is a beautiful example of a 36 note augmentation and diminution working as multiples of each other. They are patterned with the utmost regularity. The 36 note melody is expanded to lengths all of which are multiples of 36 (18, 12, 9, 6, 4, 3, 2, 1.) David Reck describes it this way:

all the instruments play and repeat the same melody but at different speeds (that is, in augmentation or diminution and eventually they all come out together: following the proportional series, if the melody is in eighth notes, it must be played 36 times to come to the end of the cycle 1X36 in quarter notes it must be played 18 times (2X18) and so on up until the largest augmentation (each note of the melody has the length of 36 eighth notes and the melody is played only once).¹⁸

This is shown in the following graphic representation. (See Figure 5.5)

The investment in methodical patterning in Gibson's processing is carried through to the performer. Once the model is completed by the players, they may change parts, at first slowly, then diminishing the time between moves, so that they hop from layer to layer at the eighth note. The way in

¹⁸ David Reck, <u>Music of the Whole Earth</u>, (New York: Scribner's Sons, 1977), p.442.

FIGURE 5.5



which this happens is also related to the 36, 18, 12, 9, 6, 4, 2, 1 series. As the ensemble Gibson usually works with contains instruments of different sonority, organ, voice, saxophone, violin, the relationship of parts is clearly audible. The vertical co-incidence which emerges from the performer choices forms accidental harmonies which are all related to the same pitches.

Augmentation and diminution control the structural relationships of one cycle thereby controlling the note to note possibilities. Diminution in the latter half of the piece controls the speed at which contrapuntal changes may take place. Augmentation and diminution are present in micro and macro elements, model and performance process.

Addition, subtraction, augmentation and diminution are lengthening and shortenting processes applied to diverse musical materials: form, structure, melody, theme, rhythm, instrumentation and duration.

Their application in works discussed in this chapter shows the individual approaches taken by composers.

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CHAPTER 6

VERTICAL, CYCLIC AND CONTRAPUNTAL PROCEDURES

Cycles as Structure

A circle is a seamless and continuous geometric form. Its information flows back into itself. In repetitive music the circle has been widely taken up in simple states such as Robin Mortimore's conceptual pieces, Very Circular Pieces discussed in Chapter 2. Joan La Barbara's Circular Song, uses cyclic symbols and cyclic pathways. Many of the sectional forms in Chapter 4 are cyclic as their parts fluently turn back through themselves. All the DA CAPO forms, where new material is interspersed can be thought of as cyclic when the original material returns. So, too, can ostinato and variation forms. Some structural diagrams can help to summarise and interpret the different cyclic techniques already alluded to in Chapters 2 and 4. (See Figure 6.1)

As can be seen from this figure, it is the end to end linear sequence of cycles which differs between types. Yet they all are cyclic works in this horizontal and linear sense.

Other works concern themselves more with the vertical relationship of parts or cycles. John

FIGURE 6.1

Cycles as Structures



Melcher's <u>Parlour Music</u> for two players or groups of players discussed in Chapter 4 is a simple extension of linear cycles transferred to vertical phases. Two sections of very similar material are structurally related, 14 bars being repeated 11 times against 11 being repeated 14 times. The rhythmic interlocking of parts that results can be represented:-



The beginning of each circle is articulated differently through accents so that from the outset the parts seem to move away from each other until the middle of the piece. Here, the new material is introduced and subjected to the same cyclic relationships. The different size of the cycles creates a sense of drifting away, while the mathematical relationship of (11 X 14), and (14 X 11) ensures their eventual convergence. The non-alignment of familiar parts extends the idea of multimetre into a type of phasing technique. Through a mechanical system of repetition, desyncronization, the changing alignment yields new musical figures continued from both parts, their pitches and articulations. The adherence to the \varGamma as the smallest unit is an integrating factor in the amalgamation of new units. (See score, Chapter 4.) The composed accents of part 1 and 2, although multiples of the $rackingthereforemath{\lambda}$, move away from each other, working towards discontinuity. As the cycles get further apart the ends and beginnings become less noticeable, while the pitch contour and accent structures form new audible by-products. Jon Gibson's Melody, and Bob Davis's Round About Sugaree are more complex examples incorporating cyclic procedures which emit interesting polyphonic textures. The Gibson piece has more layers of proportional cycles while the Davis piece relates to the old principle of canon or round.

FIGURE 6.2

Cyclic Alignment in Parlour Music#1, John Melcher



Gibson's <u>Melody</u> could also be described as a mensuration canon, the emergent polyphony being rhythmically proportional in the strictest sense.

Gibson also fuses the ideas of cycles, numerical proportions and canons in his piece <u>30's</u>, (1970-72). In this piece, there are 12 cycles, each of 16 or 32 beats. In each of the seven sections cued in the score at 1 , 2 , 3 , 5 , 6 , 10 , 15 , 30 oscillating semiquavers cut across the ensemble HIGH LOW HIGH LOW to end the cycles, or while the reverse registration, low, high occurs if half way through a cycle. The performers can choose their high and low sounds from within any simple tonality. The clarity of Gibson's attitude to cyclic material can easily be seen in this one of 2 scores provided.

Alternative notation



¹Jon Gibson, <u>30's</u>, <u>Rhythmic Anthology</u>, (London: E.M.C., 1972), p.30.

His treatment of the division of pitches into high and low per cycle is not unlike <u>Melody</u> in that the time space or length of cycle is systematically divided into proportional groups with longer periods at the end, while at the beginning there is maximum high/low contrast. Gibson's own graphic presentation of the score shows his preoccupation with structural proportions composed into the notation.



Ex.6.2, Gibson's Graph of 30's²

The model shows all possible combinations of the different high/low groupings in the piece, but the performance processing is what really produces the musical fabric. The performers, must maintain the tempo $\int = 240$ always coming together at 30 quaver intervals. The movement through the different cycles is free as long as sections do not change all at once, as the score suggests:

²Jon Gibson, in <u>Music of the Whole Earth</u>, ed. David Reck, (New York: Scribner's Sons, 1977), p.442.

All performers start at 1 (not necessarily all at once) and repeat it until they wish to go 2, 3 successively down the page... As the piece progresses it is possible to skip a section or go back to previous sections and replay them, bearing in mind however, that in general the various juxtapositions should be repeated enough times to be reasonably heard and appreciated.³

The piece ends when everyone has reached 30 and the last section has been repeated enough times, ending abruptly on the semiguaver figure.

In terms of polyphony several facts become clear:

- That all entries will be of the same audible length, 30 being the length of pulsing quavers plus 4 semiguavers being common to all.
- 2. Relationship between parts will become more linear as the piece progresses due to the players separating out in different sections and the more static quality of the repeated pitches being audible for longer time lengths.
- 3. That all imitation and movement, while being of fixed units of 30, will not be equidistant and would change from performance to performance being dependent on individual and ensemble choices.
- 4. That within the rhythmic cycles of 30/32, the audible interior grouping of High/Low pitches into 1, 2's, 3's, 5's, 6's, 10's 15's and 30's, would depend on the number of players playing sustaining instruments. Performers are

³Score, <u>Rhythmic Anthology</u>, p.30.

permitted to play the group as a drone or tied notes rather than as pulsating points on a line if desired. In performance this would influence the speed of entries considerably as the more sustained groups would have a slowing effect on the emergent counterpoint. The changes of pitch from a constant drone or pulse would be perceived differently in performance time having different effects, so that the performer choices really control the note-tonote rhythmic detail and consequent mood and energy flow. The structure too, is elastic enough to allow for systematic canonic entries as well as longer canons of quite different directions and durations. The vertical complexity of the possible counterpoint would rest on the number of performers.

Cycles as interior building blocks

Cycles as construction units are extremely common in repetitive music especially in the work of Reich, Glass and Riley. All three composers use pitch/ melodic/rhythmic cells which are usually simply related to a mode or key favouring consonance and stasis. Small variation patterns occur through re-ordering and overlapping these initial cycles. They are motives which transform slowly and are usually related to each other in pitch and rhythm. They often relate to a regular pulse. The composition of each cycle, its changes and relationship to the next become sharply

delineated through their repetition. This gives the listener time to consider the inner workings of the cycle rather like viewing the cogs in a wheel.

The 53 motives Riley uses in the seminal work <u>In C</u>, are a case in point. They appear against the pulsing drone on C throughout. The different pitch, rhythm and length of the motives plus the rate of change and stasis induced by the performer, regulate the flow of the piece.

TABLE 6.1

Characteristics of Cyclic Motives

in Terry Riley's In C

Similarities	Differences
<u>Interval</u> Repeated tone: 1,7,22,23, 24,25,26. Step: 2,3,4,5,18,20,22, 23,24,25,26,27,28,31,32, 33,34,35,37,43,44,47,48, 50. Step + 3rd: 2,11,12,13,16, 27,31,32,36,38,39,49,51. <u>Modal Centre:</u> C 1-14, 29-34. <u>Length</u> Short: =15 52,53,50,41,37,33,34, 9, 10. <u>Continuous Sound 11</u> Sustained tone: 6,30,8,14, 42,48,29	<pre>3rds and 4ths: 29, 40. 5th: 45, 46. 6th: 20. G: 15-21, g: 35-53, e: 18-28, e-b: 35. Long 8 beats: 6, 8, 48. Silence/Rests: 3,4,5,7,9, 13,15,17,19,33,35,46.</pre>

<u>ه م م</u>رز الح م م م $\beta = 30$ 31 32 33 34 346 35 The second state of t

⁴Terry Riley, <u>In C</u>, C.B.S., MS7178, 1964.

From the score certain features common to the 53 cycles of Riley's In C can be identified.

- 1. <u>The pitch movement</u> in each of the 53 cycles most commonly moves by step. It often involves an interval of a 3rd in conjunction with stepwise movement. Leaps of 4ths, 5ths and 6ths do occur infrequently but rarely more than once within a cycle. Pitch movement oscillates diatonically using ascending and descending directions pursued gradually.
- 2. <u>Rhythmic configurations</u> of two main types of fast cells in semiquavers contrast the cycles of plateau -like sustained tones and repeated pitches. Rhythmic movement prevails with few silences. Figures 7, 15, 9, 35 are figures where there is room for potential audible space. Less common are dotted rhythms and single beat cycles 15, 21, 30, 19, 6.
- 3. <u>The length of cycles</u> varies from 1 to 16 beats with 2 note tremolo figures of 16th notes being common as well as 3 note and conglomerate forms. The cycles with repeated pitches tend to be longer as in punctuated drones, 22-26. The differing length of cycles ensures periodic accentuation and phrasing, although the sense of downbeat may be misleading or irrelevant. Rather, spinning cycles appear against a point.
- 4. <u>Modal Tonality</u>. The pulsing drone of C is a constant against which all other harmonic

movement is heard. It is audibly prominent at 1-14, 29-35, 42-44. Elements of G Maj 15-21 and e minor 22-28 give relief as does the wonderful dominant 7th of C stretching from 31-41 ambiguously employing accidentals B^b B F[#] F.

The characteristics of this composed model pertain only to cycles and their detail of length, rhythm, pitch, direction, silence. Dynamics, orchestration, articulation, textural complexity and many other musical features are dependent upon the performance practice. The resultant counterpoint, the number of entries, the degree of repetition and change are performance variables. The cycles are the fragments from which the piece is gathered together. David Behrman describes the score as "a sort of launching pad."⁵ His notes clarify procedural and musical details:

Each member of the ensemble plays the fifty-three figures of the score in sync with the pulse and moves consecutively from Figure 1 to Figure 53. When he moves from figure to figure, where he places his downbeat, and how often and how long he rests is up to him. A performance ends after all the players have arrived at Figure 53. The quality of the music depends upon spontaneous interaction within the ensemble. A good performance reveals a teeming world of groups and subgroups, forming, dissolving, and reforming within a modal panorama which shifts over a period of about forty-five to ninety minutes from C to E to C to $G.^6$

The simultaneous working through of more than one cycle at a time is perhaps the dominant trait in Riley's

⁵David Behrman, Notes to <u>In C</u>, CBS MS7178, 1964.

⁶Ibid.

other solo works. In <u>In C</u> the 53 cycles in the hands of an 11 member ensemble has a great contrapuntal potential. In the CBS recording, great washes of sound can be heard as players converge and retreat. Adding to the complex vertical relationships between cycles is the fact that the recording was built up in three layers with two overdubs synchronized to the original 11 member ensemble performance. The final instrumental forces are 3 vibraphones, 3 saxaphones, 3 trombones, 3 violas, 3 flutes, 2 bassoons, 3 oboes, 3 trumpets, 2 marimbas, 2 clarinets and piano. The extremes of sonority and complex vertical relationships even in Riley's very early work set his music apart from other 'repetitive' composers.

Steve Reich's preoccupation with repetition was partly nurtured through his contact with Riley in this work.

The idea of using constant repetition partially grew out of working with tape loops since 1963, but mainly through helping Terry Riley put together the first performance in 1964, of his <u>In C</u>, where many repeating patterns were combined simultaneously. My problem was then to find some <u>new</u> way of working with repetition as a musical technique.⁷

The new way was the phase, a repetitive technique which utilises all vertical alignments of a cycle against itself. (See Figure 6.3) Its discovery for Reich in the early tape piece,<u>It's Gonna Rain</u>, 1965, was crucial to his development as a composer. He uses this process in all of his pieces from 1965 until

⁷Steve Reich "Notes on Compositions 1965-1973", in <u>Writings About Music</u>, (New York: Universal, 1974), p.50.

FIGURE 6.3

Phasing Cycles



<u>Drumming</u> in 1970. The basic idea grew out of the tape recorder. Reich experimented with loops, (cycles) played against themselves and noticed that even when lined up in unison, they would slowly drift apart little by little, gradually moving back into unison. It is this simple process which becomes the structure for <u>Come Out⁸</u>, <u>It's Gonna Rain</u>, and <u>Melodica</u>. Reich was attracted to the mechanical aspect of setting the process up to run by itself, free of personality. The changes would be so slow that they would be audible. So came about the gradual phase shifting process.

As I listened to this gradual phase shifting process I began to realize that it was an extraordinary form of musical structure. This process struck me as a way of going through a number of relationships between two identities without ever having any transitions. It was a seamless, continuous, uninterrupted musical process.

It is the alignment or non-alignment of the two or more repeating musical patterns which may be called cycles that commands the attention. While being a

⁸See detailed description of tape technique of this work, Chapter 7.

⁹Reich, p.50.

canonic and imitative device not unlike the round, the time interval between the original and its imitation is not fixed and depends on the mover. The number of subdivisions between adjacent rhythmic units of the pattern is controlled by the performer who moves ahead ever so slightly yet maintaining the overall tempospeed of the original. In an interview with Terry Calhoun in April 1982, Reich explains this from the point of view of performance practice:

the playing of two repeating patterns of the same time, one musician stays constant and the second musician slightly increases his speed. Now this is very difficult to do because in every music you're taught to keep a steady pulse and you can't just sort of irrationally slide ahead tempo-wise. But in fact you can - if you rehearse. Ah and what this produces is ah gradually from unison you sort of shake a bit and reverberate a bit and finally you're 1/16th or 1/8th note ahead of the other player. At which point, you're creating a kind of pattern or round on this very short pattern - ah what one will hear is basically a bunch of sub patterns - you'll hear the lower notes creating a series of short repeating patterns. You'll hear the middle range creating other patterns and the highest notes creating still others depending where your aural attention happens to go at the moment.¹⁰

It is this procedure which takes place between cycles or repeated patterns marked with dots in the scores <u>Piano Phase</u>, 1967, <u>Violin Phase</u>, 1967, <u>Drumming</u>, 1970-71 and <u>Phase Patterns</u>, 1970. The scores now published by Universal are really documentation of the content of cycles, their order and when to phase. They are merely mnemonic aids and do not indicate anything like the audible outcome. The works are conceived in

¹⁰Transcript of taped interview, Terry Calhoun, 1982, N.Y. Radio Interview; broadcast 7.30p.m., 18th June, 1982, 3AR Australian Broadcasting Commission.

the listening - doing mode and require that type of ensemble virtuosity. Reich states:

what you have to do to play the piece is to listen carefully in order to hear if you've moved one beat ahead, or if you've moved two by mistake, or if you've tried to move ahead but have instead drifted back to where you started. Both players listen closely and try to perform the musical process over and over again until they can do it well. Everything is worked out, there is not improvisation whatsoever, but the psychology of performance, what really happens when you play, is total involvement with the sound; total sensuous - intellectual involvement.

In the score of <u>Piano Phase</u>, 1967, the logical sequencing of the pattern against itself with all the tiny phasing steps in between is quite obvious.

All the rhythmic shifts of the 12 note pattern move in sequential order. The 'accelerando very slightly' and 'hold tempo 1' are the most important signals in controlling the slow movement of vertical relationships in this 2 part counterpoint. At 13, the initial figure has been phased while 14-16 are a unison transition of the motive and solo before a new 8 note rhythmic pattern is introduced at 17. This is then phased through its 7 shifts. The same unison and solo statement transition occurs at 25-26, before the new 4 note pattern is phased, ending the piece. The 3 different repeating patterns bear much resemblance, as they develop out of each other and are easily memorized. Each piano introduces one new motive. Reich approaches the keyboard from the perspective of a drummer writing melodic figurations which conveniently

¹¹Reich, p.52.

piano phase

2

for two pianos or two marimbas*

steve reict



¹²Steve Reich, <u>Piano Phase</u>, (London: Universal, 1980), p.1.

Ex. 6.4, (continued.)



fall into set left and right hand positions. With the tempo set at $J_{\cdot} = 72$, the performer is free to concentrate totally on the passing of time in a rhythmic sense, rather than being pre-occupied with complex finger technique.

Phase Patterns, 1970, for four electric organs extends the phasing process to four voices, being similar instruments using a similar very physical drumming style of keyboard technique. Based on the paradiddle, the players literally drum up and down in the configurations: L R LL RL RR. It is as if the hand position itself is the cycle to be phased. Visually in performance, the kinetic process is an anagram of the musical phasing process.

In <u>Violin Phase</u>, 1967, Reich scores the combined results of three tracks of the 4 violins, all playing the same cycle. It is an attempt to deal with the musical by-products of phasing in notation. At this time, 1967, the results of the interlocking cycles which he calls 'resulting patterns'¹³ and the extent to which they were audible was taking a lot of the composer's attention. In this work the original and emergent counterpoint is made to recede and emerge through graded dynamics and doubling of resultant patterns in another voice. The composer also allows the performer to make individual choices and provides space in the notation for these to be coded.

¹³Reich, p.53.







¹⁴Steve Reich, <u>Violin Phase</u>, (London: Universal, 1979), p.2.

With <u>Drumming</u>, 1970-71, Reich brought his phasing process to a pinnacle in terms of the pure form, its expansion, refinement, length and amalgamation with other processes. At the end of this mammoth four part work for large ensemble, three groups of instruments of different timbre marimbas, drums and glockenspiels, all phase the same rhythmic material but at different pitches. Marimba 1 phases against marimba 2 followed by drums 1 against 2 at 113 and glockenspiel 1 against 2 from 115.

In Ex.6.6, the timbral and pitch differentiation between the six strands makes the individual phasing quite audible, despite the sonorous and thick texture. The impact of this as a finale is made more acute by another process simultaneously at work over an extended time scale, the substitution of beats for rests.

Substitution of Beats for Rests

This process is entirely dependent upon a repeating cycle. Gradually beats are substituted for rests or alternatively rests for beats. In part 4, as well as the simultaneous phasing of three groups entering in imitation, this device, in this case, beats in place of rests, by textural compression gives rhythmic intensity as in a gradual diminution.

In part one of <u>Drumming</u>, this new process is completely visible in the score. (See Ex.6.7) It is easy to see that the cycles become more and more solid as the empty space gives way to definitely articulated

Ex.6.6, Steve Reich, Drumming¹⁵



¹⁵Steve Reich, <u>Drumming</u>, (London: Universal, 1980), p.24.

Ex.6.7, Steve Reich, Drumming¹⁶ 1 HARD STICKS TWO, THREE, OR CHART & 3 3 7-





16Steve Reich, Drumming, (London: Universal, 1980), pp.1,10. beats. The hard stick attack emphasizes the rhythmic construction principle¹⁷ at work.

This technique, a subsidiary cyclic principle was extremely prevalent in works after Drumming. Three major works composed in 1973 all use this repetitive process. Six Pianos, Music for Mallet Instruments, Voices and Organ, and Music for Pieces of Wood. Clapping composed in 1971 is really a point of style change in Reich's output. It put an end to the phasing process by returning to the simpler cyclic technique, the canon. It is not a phase piece but a simple sequentially ordered cyclic piece with changes in multiples of the beat, not in between the beats as in phase. The first player being stationary, plays a rhythmic cycle as a tape loop ostinato, while the second player moves through every possible re-ordering of the set until he is back at unison. (See Ex.6.8) The rhythmic interlocking occurs as the four ensemble quaver rests of the opening bar are gradually moved out of alignment and back. Bars 4, 6, 8 and 10 have two ensemble rests, bars 5, 9, and 11 have one, while the others none.

In Reich's works, nearly all vertical cyclic relationships are explored: internal reiteration, doubling, phasing, polyphonic imitation of all types canon, round, resultant patterns, hocket and heterophony.

¹⁷Reich's own term for beats substituted for rests.

clapping music

for two performers

steve reich



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Printed in England.

These types of cyclic and contrapuntal procedures have been widely taken up by other composers and in the main are not new. Around the same time that Reich was working on rhythmic construction, James Tenney was also substituting beats for rests as a way of controlled and 'gradual' thickening of texture.¹⁸ His Wake for Charles Ives, 1974, is a graded rhythmic construction piece for four tenor drums which functions like one great dynamic and rhythmic crescendo from beginning to end. In his Hocket for Henry Cowell, 1975, sustained tremolo drum rolls enter in canonic imitation at the interval of the bar. After 25 bars, rests begin to enter the sound filled texture until the rhythmic interlocking of shorter note values moving from semibreve to demisemiquaver become more and more prevalent. At 76, the sustained tone principle is reintroduced canonically.

Canonic imitation was treated even more vertically in <u>Spectral Canon for Conlon Nancarrow</u> where the alignment of tones works from 1-24 voices being especially suited to the harmonic player-piano which can hold down so many notes simultaneously. As well as the contrapuntal thickening of voices, the introduction of the harmonic series above the note A serves to add acoustic cover to the pitch/rhythmic compression while it is happening. The following examples give a summary representation of the piece.

¹⁸Pieces for Stephen von Heune's Sound Sculpture DRUM, see Physical Processes, Chapter 7.



19_{James} Tenney, <u>Spectral Canon For Conlon</u> <u>Nancarrow</u>, <u>Pieces</u> : <u>An Anthology</u>, (Vancouver: A.R.C., 1977)
The absence of pulse, and the spreading of notes in space notation makes this canon particularly fascinating as metrical implications and mathematical proportions are defied. The notes slide and glide closer together across the space. Because of the depressed pedal and tuning of the instrument throughout, the wash of overtones gathering would intensify the pitch/rhythmic construction timbrally.

Most of the Experimental Anthologies abound with cyclic pieces. Megan Roberts <u>Applause for Small</u> <u>People - A Pygmatic Function</u>, of 1977, published in <u>Break Glass in Case of Fire</u> works exclusively on the vertical relationship of rhythmic cycles of 14, 12, 10 and 8 beats with a cello doubling all coinciding points between cycles. (See Ex.6.10) The sounds of vocal hooting, body slapping and stick clicking are derived from the orderly songs of the Bambuti Pygmies. The way these are co-ordinated is described in the instructions to the score:

Instructions

Oo - slap hands or sticks on floor, box, drum, knees...
 - clap hands or sticks together
 - hoot (vary pitch and timbre to reinforce cycles)
 123 - read numbers outloud sans hands or sticks

a piece for 8 or more voices, amplified cello, and optional modified click track.

Ex.6.10, Megan Roberts, Applause for Small People -

A Pygmatic Function



The similarity of this piece to Reich's resultant patterns can hardly pass unnoticed, although the audible result of the pitch/timbre and polymetric characteristics of this composition would stand it quite apart.

Warren Burt's <u>3x4x5x6x7x8x9</u>, 1980, works with the continuation of cycles of different length against each other. Seven pre-set pulses using the 3rd, 4th, 5th, 6th, 7th, 8th and 9th subharmonics of a high tone are intersected at the rhythmic intervals of the numerical title. Using a modular Serge synthesizer, and an electronic box of dividers he had built, Burt could fabricate the following scheme which is used as the basis of the piece. Against this model, the composer improvises on the machines inducing real time variation.

Ex.6.11, Cyclic Model in 3x4x5x6x7x8x9, Warren Burt



Subharmonics of One Tone

In a performance on November 12, 1980, the following procedures took place. The piece began with a fade in of the pulse structure. Once this was established, the composer varied the sounding polyphony by gating some of the tracks on the mixer. Towards the middle of the piece, the composer introduced new melodic material being based on the 11th and 13th harmonics of the original sound tone which had the disturbing effect of gradually breaking down the predictably comfortable harmonic and rhythmic set. Despite the attention of providing a backup reset programme to ensure continuation of the preset cycles, the variations induced became more attention seeking. The role of the improvising composer changed the degree of repetition and continuity patterns into something which could almost be classed as ternary form. Elements of the pulsing set gradually reclaimed their status towards the end of the piece.

The composer, in notes to a performance of the piece on November 3rd, 1980, describes the idea for the set and the musical marriage of the piece with a similar video procedure:

Just as I was starting to work at WRPI I received a letter from Ned Sublette, one item of which was a numerical grid of a 3 every 3 spaces, a 4 every 4 spaces on the next line, a 5 every 5 spaces on the next, and so on... It was easy to set up a sound equivalent of this with the 3rd harmonic every 3 beats, the 4th harmonic every 4 beats etc. down to 9. This is the sound for the piece. A video analogy to this procedure was set up with a pattern of 5 horizontal divisions of the screen every 5 beats, 6 divisions every 6 beats down to 9. Unlike the sound though, 2 video patterns gated together do not form an interval, but a new pattern. So only 5 different gatings were needed to make an interesting

graphic. The video and sound were recorded separately, making for interesting in and out of phase relationships in the final result.²⁰

Burt uses cycles for control, variation and freedom. This piece is an interesting combination of the extension of cycles through the music into video synthesis. Although the set is precisely fixed and audibly repetitive, Burt cannot resist the opportunity to humanly manipulate and change it. The tools are minimal and tightly related. Burt accepts a much greater role of change than many other composers of repetitive music, especially considering that the length of the piece is only 5 minutes.

Cycles and vertical contrapuntal devices such as canon, phasing and hocketing techniques are perennial through the repertoire of repetitive music from 1960-1983. Large and small scale cyclic principles work in linear and vertical configurations yielding different musical results in different contexts. The degree of continuity and diversity, hence, the degree of repetitiveness varies from work to work. Cyclic principles can be agents for change and variation through overlapping transformation or stasis by extended repetition.

²⁰programme Note for <u>5 Moods for Video Tape</u> and Stereo Sound, 1978-1980, Clifton Hill Community Music Centre.

CHAPTER 7

PERFORMANCE AS PROCESS :

PHYSICAL, MECHANICAL AND HUMAN PROCESSES.

In chapter 2 the great range of musical performance methodology was made clear. Many works involving physical, mechanical and people processes were discussed in the light of the complex relationship between models and processes. This chapter is an extension of those dichotomies from the performance practice point of view. Without replicating essential performance practice variables outlined in Chapter 2, the emphasis in this Chapter is on a more detailed look at pertinent examples of repetitive music and the processes involved during performance time. The term real time processing will be used to mean those processes which occur in the performance time. This chapter deals with the moments in which models and processes symbiotically fuse to create the sounding product.

Musical content cannot help but be affected by musical method. The type of generation process will shape the sounding event of repetitive music, whether it be physical, mechanical or human, or any combination of these. The degree of rigour or elasticity which is

predetermined, to some extent fixes the work, but the intuitive, ideological and musical predilections of the specific performers are the everpresent filter banks through which the music passes. Performers of repetitive music have had to address themselves to these recurrent issues prevalent throughout the repertoire.

Common Features in Repetitive Music¹

- * Repetition in audible parameters.
- High degree of continuity ability to sustain,
 prolong something set up.
- * Restriction of material within narrow limits often favouring reduction and elimination.
- * Tendency toward detailed small scale change.
- * Obsessive preoccupation with the single parameter or event.
- * Altered time span stasis, hypnosis.
 Heightened consciousness.

The above features are much more commonly dealt with in eastern music. For Western musical performance, this represents a shift of mode. A high degree of surface change, variety and contrast no longer prevail. The realisation of repetitive music is ongoing and continuous in a single direction. The constancy of reproduction has undeniable roots with

¹Style features, Pulse, Drone, Length, Overtones, Harmony, Counterpoint Imitation, Motivic Variation, Cycles, as a basis for comparing the repertoire will be dealt with in Chapter 9.

mechanical action. Nowhere is this more in evidence than in a highly sophisticated and mechanised industrial society. The technological explosion particularly in this period since the 1960s, and even more particularly in America, can hardly be ignored. Traditional work roles have been uprooted and new manmachine relationships implanted. There are new problems and new possibilities. Mass production, assembly lines and robots, have monopolised people in the interest of greater profit, while from the creative point of view, new possibilities have opened up with every new invention. The impact of electronically powered sound apparatus and its ability to prolong, store, replicate, and process was noted in Chapter 2. New materials, new performer/composer roles, new performer/listener situations have greatly challenged traditional performance norms and since the 1950s great energy has been directed to this experimentation. In two essays by Richard Maxfield 'Composers, Performance and Publication' and 'Music, Electronic and Performed', the musical and social consequences of these changes as they affect performance are taken up at length.² In an overview of the performance of repetitive music it is helpful to detail some of the major changes which were already occurring in new music before 1960.

1. Sound recording as a compositional medium allowed the composer to:

²La Monte Young and Jackson MacLow, eds., <u>An</u> <u>Anthology</u>, [Munich] Heiner Friedrich, 1963.

- (a) have direct control over the exact sounds made in performance time.
- (b) avoid performer/interpreter problems of accuracy, taste, and the social and organisational problems of cost and finding players.
- (c) have greater unity of artistic intention.
- 2. New modes for the performer.

New measuring machines and new instrumental motor skills have had to be acquired. The performer must become a technician, as it is he who has the final say in shaping music in live New hybrid situations in playing along mixes. with machines have evolved. Joel Chadabe's real time interactive composition with computers is a good example where the composer performs with the computer in real time to make the piece. Repetitive rhythmic cells are preset and stored for selection on computer disc. Performers have had to realise that they can be eliminated by machines and may be made redundant if they fail to meet new demands.

3. New modes for the listener.

Greater spatial distribution of sound throughout the listening space has been made available in taped compositions. Taped concerts have removed the visual aspect of some traditional performances often replacing the

human performer with audio visuals.

The interface of man and machines, of the physical and human, is one of the greatest social issues of the twentieth century. Musical performance has been greatly effected. Music as a social activity has been challenged and investigated. Human activity can be displaced by machines, yet machines are reliant on humans for their creation, and for specific roles such as activation and servicing. For composers of repetitive music, electronics and mechanisation in principle and device offer a great deal. The choice is never bipartite. Aesthetic intention, human preference, human skill, social context are tremendous influences on the type of processes employed during performance time.

Ability to build new electro-mechanical devices, or having access to digital synthesis sound equipment, may determine their possible use just as interest in intuitive and spiritual phenomena or availability of skilled instrumentalists may steer a different course.

Composers and performers of repetitive music have reconciled these demands and possibilities in individual ways. They have used all variants of electronic sound sources and processes in devices, such as computers, unique mechanical devices, physical processing involving repetitive actions, physical environments, and human interactive processes. The latter are just as varied in their composition and

intention, from solo performer to large ensembles, extreme individuality to collective. Almost all of the features listed here have a purist application in the performance of repetitive music, but more commonly they are not chosen in isolation. Several features are amalgamated. For example, electro-mechanical combinations abound and these can be physically processed in performance or interacted with by means of human performance. Performance itself is a holistic process. Decisions are made and the consequences are experienced by the listener during performance. Machines, physical acts, new devices, human performance are agents of sound delivery. As performance processors, they effect and articulate the sound image.

The composer-performer Steve Reich has grappled with these problems and possibilities. Throughout his career, he has chosen mechanical, physical and human performance processes, combining, rejecting, and reforming his ideas. These personal choices are well documented in his Writings.

Steve Reich's initial interest in repetition came from machines. Certainly his discovery of the gradual phase shifting process came about during experimentation with simultaneous playback of two aligned tape loops and their subsequent drifting further and further apart.³ <u>Come Out</u>, 1966, one of the first recorded and commercially available pieces of

³See a discussion of early works <u>It's Gonna</u> <u>Rain</u> etc. in Chapter 6.

repetitive music, is a product of Reich's love affair with tape as a medium. "I went on this binge working with tape" and later in the same interview "what tape did for me basically was to realise certain musical ideas that at first just had to come out of machines."⁴ Reich goes on to make a detailed statement of the specific tape techniques involved in <u>Come Out</u>:

I first made a loop of the phrase 'Come out to show them', and recorded a whole reel of that on channel l of a second tape recorder. I then started recording the loop on channel 2; after lining up the two tracks, with my thumb on the supply reel of the recording machine, I very gradually held it back (I was literally slowing it down, but at such an imperceptible rate that you can't hear) until 'Come out to show them' had separated into 'come out-come out/show them-show them' (which is something like two quavers away). At that point I take that twochannel relationship, make a loop from it, feed it into channel 1 again, hold it back with my thumb so that it is four quavers away from the original sound and can be heard as a series of equal beats, so that it is quite distinct melodically. I then spliced together the two-voice tape with the four-voice tape-they fit exactly-and what you sense at this point is a slight timbral difference, due to all this addition, and then all of a sudden a movement in space. At that point I then divided it again into eight voices, separated it by just a demisemiquaver, so that the whole thing began to shake, then just faded it out and again put those two takes together. So there's absolutely no manipulation of the timbre, no manipulation of the tape.

The process of composition with the taperecorder ends in a frozen tape piece. The performance aspect happens during the act of composition, by the composer himself. It removes the possibility of emotive interpretation. "Mechanical

⁴"Steve Reich: An interview with Michael Nyman", <u>Musical Times</u>, 112 (1971), pp.229-30.

⁵Ibid.

playing is something we could do with more of, and the 'human expressive activity'... is what we could do with less of right now."6

In <u>Pendulum Music</u>, 8/1968, Reich set up a physical process which like the tape pieces, could run by itself.⁷ The feedback between the microphones and speakers would emit phasing pulses due to the kinetic action of the microphones suspended as pendulums from the ceiling, moving to and fro in relation to the speaker. The physical suspension process coupled with the acoustics of the space, determined the rhythmic space and pitch tones of the music. (See Ex.7.1)

In his early works the idea of processing in performance time was essential. Reich revelled in the idea that no human intervention was necessary. Physical processes which run by themselves held his fascination for a long time. In his article 'Music as a Gradual Process', 1968, he cites three examples:

"pulling back a swing, releasing it, and observing it gradually come to rest;

turning over an hour glass and watching the sand slowly run through to the bottom;

placing your feet in the sand by the ocean's edge and watching, feeling, and listening to the waves gradually bury them."⁸

⁷See discussion of cyclic phasing in early works <u>It's Gonna Rain</u>, Chapter 6.

⁸Op. cit., p.9.

⁶Ibid.

Ex.7.1, Steve Reich, Pendulum Music, A Physical

Process⁹

PENDULUM MUSIC

FOR MICROPHONES, AMPLIFIERS SPEAKERS AND PERFORMERS

Three, Four, on more microphones are suspended from the ceiling on from microphone boom stands by their cables so that they all have the same distance from the floor and are all free to swing with a pendular motion. Each microphone's cable is plugged into an amplifier which is connected to a loudspeaker. Each microphone hougs a few indus directly above on next to its speaker.

Before the performance each amplifier is tormed up just to the point where feedback occurs when a wite swings directly over on next to its speaker, but no feedback occurs as the wite swings to either side. This level on each amplifier is then marked for future reference and all amplifier are turned doon.

The performance begins with performers taking each wike, pulling it back like a swing, and then holding them while another performent to this up the amplifiers to their pre-martel levels. Butormens then release all the micophones in unison. Thus, a series of feedback polses are heard which will either be all in unison or not depending on the gradually changing phase relations of the different mike penduluns.

Performents then sot down to watch and listen to the process along with the rest of the audience.

The piece is ended sometime shortly after all with have come to rest and are feeding book a continuous tone by performers pulling out the power cords of the amplifiers.

Here Reich 8 68 revised stas

Just as these processes involve very slow and gradual change, so too the musical process should be slow and gradual enough that all the details of the change can be perceived and heard.

"The distinctive thing about musical processes is that they determine all the note-to-note details and the over-all form simultaneously. One can't improvise

⁹Steve Reich, <u>Writings About Music</u>, p.9.

in a musical process."10

Reich's concept of gradual musical process in the early years was rigid and mechanical. Usually one musical element was treated in a single minded linear direction. The small number of elements meant concentration on the detail of the process. The entire score for Slow Motion Sound, 9/67, reads:

Very gradually slow down a recorded sound to many times its original length without changing its pitch or timbre at all.¹¹

Reich explains that:

the roots of this idea date from 1963 when I first became interested in experimental films, and began looking at film as an analog to tape. Extreme slow motion seemed particularly interesting since it allowed one to see minute details that were normally impossible to observe. The real moving image was left intact with only its tempo slowed down.¹²

Reich's experiments with complex technology such as vocoders, digital analysis and synthesis, and tape recorders with rotating heads at the time could not yield the desired response. An idea, rooted in technology could not be successfully realised by it at that point in time. Yet the slowing of the tape loop of an African girl saying "My shoes are new" to ten

10Reich, p.9.

¹¹Reich, p.14.

¹²Steve Reich, "Slow Motion Sound: Notes," 9/73, in Soundings 7-8, ed. Peter Garland, (Danville: Garland, 1973), pp.51-60. times the original length did show microscopic pitch changes between one letter and another. Despite abandoning the realisation, the idea as a musical process continued in augmentation in Four Organs, ¹³ 1970, and Music for Mallet Instruments, Voices and Organ, 1973. Reich's preoccupation with the mechanical aspects of musical processes led him to spend all of 1968 and half of 1969 developing an electronic device called the Phase Shifting Pulse Gate.¹⁴ This device is an elaborate rhythmic gate which can divide a common time unit into 120 divisions. As there are twelve channels, twelve different sound signals can be routed through it at any one time by any chosen time interval. Its principal musical function was to allow infinitesimally small differences between phasing cycles and to allow great complexity and flexibility in what might be able to occur simultaneously. Reich explains that:

Since at very slow tempos the rhythmic movement from one '120th note' to the next is barely perceptible, each channel becomes, on a perceptible level, continuously phase variable in relation to all others."¹⁵

Reich saw it as allowing the phase relationships to change and interrelate in ways which may be too difficult to perform with players:

"Performing such interlocking music would not be

¹³See Chapter 5.

¹⁴Structural features of this machine are documented by the composer in Writings, pp.18-20.

¹⁵Reich, <u>Writings</u>, p.20.

too hard to do but to play, pause and also very gradually shift one's phase relationship to the other players would be almost impossible.16

Use of the Phase Shifting Pulse Gate was shortlived. Two pieces Four Log Drums, 5/1969, and Pulse Music, 5/1969, utilised the machine giving signals to performers. For Reich, this led to a major break with technology and a swing to live performance as he found that although the ideas "underlying the gate were sound,... they were not properly realised in an electronic device."17 The machine pulse signals were found to be stiff and unmusical when compared with the sort of musical ensemble pulses felt by the performers. Yet despite the fact that in 1969 Reich put away electronics, he was indebted to them for all of his major structural ideas, loops, phase, augmentation and his commitment to a real-time performance process. It was a grounding firmly rooted in electronics.

Reich certainly was not the only composer to try for musical and mechanical processes which would be self-perpetuating. Two of John Dinwiddie's pieces, <u>Duet for Lovers</u> for Tony Grazzo, 1971, and <u>Drift</u> for John Mizelle, 1970, are both concerned with electronic and mechanical devices as performers. They are metronomes and oscillators. The first piece uses two or three electric metronomes with unnotched tempo

17_{Writings}, p.25.

¹⁶Reich, "The Phase Shifting Pulse Gate Four Organs (1968-1970) an end to Electronics," in <u>Writings</u>, p.18.

controls which are to be gradually adjusted until they tick forever "as one". The second piece calls for two or more oscillators divided into two equal or nearly equal groups. Each set is to be tuned to unison, a minor 3rd, 4th, 5th or major 6th apart. The resultant diad is "to persist for a minimum of half an hour preferably much much longer."¹⁸ The simple and small scale gradual change which comprises the full extent of the musical processes is completely dependent on the nature of the particular machines used and the way they are adjusted.

Brian Eno, like Reich, also traces his interest in self generating gradual processes and slow static music to his early experiments with tape recorders in 1964. In the notes to <u>Discreet Music</u>, a long, slow continuous piece using cyclic repetition and fixed rhythmic time units, one would think Reich is talking:

I have gravitated to situations and systems that once set into operation, could create music with little or no intervention on my part... That is I say I tend towards the roles of planner and programmer and then become an audience to the results... <u>Discreet Music</u> is a technological approach to the problem. If there is any score for the piece, it must be the operational diagram of the particular apparatus I used for its production. The key figuration is the long delay echo system with which I have experimented since I became aware of the musical possibilities of tape recorders in 1964."19

18_{Composer's Comment in score, Soundings 7/8}, p.67.

¹⁹Brian Eno, <u>Discreet Music</u>, record cover, Obscure, 3, 1975.





As a composer he sets up the material to be stored and mechanically processed. The piece is made from two melodic lines which are of different lengths but mutually compatible. These are stored on a digital recall system. The timbral treatment of these melodies is effected by altering the timbre of the synthesizer output by means of a graphic equalizer. Eno writes extensively about the passive role of acceptance of that which follows. He is not interested in sudden changes of human manipulation but rather a predictable

20 Ibid.

steady state with slow minimal changes. This attitude extends through his mood ambience pieces such as Music for Airports which are an attempt to create an atmosphere in the backgroud, an intellectual and artistic type of Muzak. The performance of the machines treating the original composed melodies makes the piece into a tape. A public performance is tape or video playback generally set in a social context which is appropriate, where the music is intended to have a very low performance profile. It is really a continuous tint, barely perceptible, a non-dramatic performance playback music. At London's ICA 'Musica,' September 7-11, 1982, Eno's ambient music video Mistaken Memories of Medieval Manhattan, was installed for a week in the bar and restaurant area. Installation as performance process puts the responsibility of defining the length of time of the piece and hence the beginning and end, onto the listener / perceiver who is free to come and go at will.

Installation as Performance Process

The relationship between continuous installation and repetition in music is fascinating. Firstly, as in the Eno case, it often utilizes mechanized technology. One can hardly expect live continuous performance for a week from one human performer.²¹ Secondly, installation usually maintains

²¹Some continuous human performances have lasted long periods of time. Satie's <u>Vexations</u> immediately springs to mind as a precedent.

a steady state or condition against which the audience behaviour can be seen to contrast by coming and going. Thirdly, the degree of concentration of repetition and possible interaction is generally given obvious articulation by the artists. Installations range from pre-programmed static sound sculptures such as the Australian works <u>Saturn Sculpture</u>, 1977, by Steve Dunstan, and Les Gilbert's <u>Telephone Table</u>, 1981, to interaction pieces where the audience or the environment can activate or change the sound environment, such as those mentioned under physical models in Chapter 2.

Each installation must define constants as well as the performer/listener roles. The larger issue of what is a performance, who or what is the performer and for whom is it geared is one of the challenges for installation artists. If the performer-activator of the sound through time is electrical, mechanical, human or combined, the content will be affected. The audience has the freedom to determine the performance experience in terms of route, length of time and level of participation. An installation such as a continuous time environment, sounded over many weeks may or may not be perceived as a repetitive work although the social and musical context may be rigidly set to be continuous and repetitive.

The dichotomies of continuity and change, repetition and variation, are at the whim of this open time-framed genre. A work can only be guaranteed to be

repetitive if all the variables are known and pursued. Aspects left to chance may be able to detract from the repetitiveness by inducing change. Installations' greatest attraction to composers and artists dealing with continuity, repetition, and minimalism, has been that of the possibility of long duration for both performance and perception. Installations utilize specific physical locations for long periods of time. They have a greater potential for extending time duration than more traditional performance situations.

Physical Processes - venue as performance processor

The physical nature of the performing space has been explored in great depth in new music since 1950. Composers of repetitive music have also chosen to use physical attributes of the performing venue as the subject of the music and worked with standing waves, acoustic reverberation times, multiple generation and acoustic processing.

One of the most important examples of repetitive music which applies a recurrent action, rerecording, in an acoustic space is Alvin Lucier's <u>I am</u> <u>Sitting in a Room</u>, 1970. It involves the composer sitting in a room reading and recording the text, playing the recording back in the space, and rerecording it again and again. The text describes the situation the composer is trying to induce so that the method becomes the content.

I am sitting in a room different from the one you are in now. I am recording the sound of my speaking

voice and I am going to play it back into the room again and again until the resonant frequencies of the room reinforce themselves so that any semblance of my speech, with perhaps the exception of rhythm, is destroyed. What you will hear, then, are the natural resonant frequencies of the room articulated by speech.

I regard this activity not so much as the demonstration of a physical fact, but more as a way to smooth out any irregularities my speech might have.²²

The process of performance modifies the text each time with some vocal tones being amplified and accentuated by the resonant frequencies of the performance space. Others are dampened. Alvin Curran describes the effect of the tape playback as it impressed him as a listener

in the composer's home soon after the piece was made.

After a MEV concert at Wesleyan Univ. in 1970 Alvin Lucier invited us to his home. Following the excellent food, wine and smokes, Alvin entertained us by playing his then recent piece 'I AM SITTING IN A ROOM', accompanied by Mary's slides (using the same technique Alvin used in recording, here with photography, i.e., a photo of a photo of a photo ...etc.), all done in the same room where the recording and photo were made. As the process of gradual disintegration and transformation unfolded, and all intelligible speech and image disappeared, so too, everyone in the room, themselves locked into this inevitable process, seemed to disappear. In the end when the resonant frequency of the room filled the air and the last image - a grey blur stood immobile on the screen - heavy limbs began to stir in wonder - 'Was it me?'23

The performance process is a monodirectional event with small scale accumulative change proceeding in a thoroughly predictable manner. During the half hour version of the composer's original tape, I noted

²²Stuart Marshall, "Alvin Lucier's Music of Signs and Space," <u>Studio International</u>, 192 (1976), pp.284-88.

²³Alvin Curran : "Multiple Reflections on Musics 15", <u>Musics</u>, No.16, (1978), p.8. the following seven stages in sound transformation;

- 1. Original text with stuttering,
- Very similar, text fully audible. Ambience noticeable.
- Increased echo. Timbre more reverberant.
 Drone tone at F[#].
- 4. Constant duplication of the text a fourth above at C[#]. Speaker sounds as if a resonator is being used. Speech attacks trigger high frequencies.
- 5. Constant drone, extra hiss. Increased number of high frequency tones even in the space between words.
- High pitched frequencies clustering together.
 Lower speech voice on F[#] inaudible. Drone present but overshadowed by modules.
- 7. Voice almost inaudible. Motives of high frequencies are accelerating in number and speed. The original has disintegrated into a reverberant sound resembling someone irregularly shaking beans contained in an amplified bottle.

This could also be represented by the following diagram:

FIGURE 7.1

Effect of Re-recording in Alvin Lucier's, <u>I am Sitting</u>



in a Room

The details of these observations only pertain to this realisation of the composer's version in that particular acoustic. The successive generations serve to articulate the frequencies and acoustic potential inherent in every performing space. In this piece they are sound modifiers able to be observed in the foreground of musical information and repetitive procedure. The increased distortion, tape hiss, and ambient noise are high profile material and they provide a set of timbral variations on the original text.

Bill Fontana's version of the Lucier piece performed in the concert hall of the Sydney Opera House, Australia, used the same procedure but with a fifteen second tape delay instead of splicing all the

versions together. The shorter text declaimed in a bold and forceful vocal style set a different type of original and in the larger space brought about much more radically shifting motives. Less generations were needed to annihilate the voice because of the high degree of resonant frequencies activated by the composer moving in the space and because of the location and nature of the tape delay set up. There were thirteen statements of the text, "We are at the concert hall of the Sydney Opera House recording the resonant frequencies, 1 2 3 4 5 6 7 8." Over this much shorter time span, similar timbral formations to the Lucier piece became audible. Both versions rely on the design of the space and the formants of the voice for the activation of resonant frequencies as spatially determined sound modifiers.

Michael Parson's <u>Echo Piece</u> 1973 uses a physical spatial process, the echo, to process the musical material in real time. The speed of the echo effects the duration and direction of the performers. In addition it modifies the timbre and induces imitation. The echo imitates and is interpreted by the two players as they move through a wide open space. It is an audible cue for the walking pathway.

ECHO PIECE for two people with woodblocks

Michael Parsons

Find a wide open space with an echo.

Start as near as possible to the place where the echo comes from. A (first player) begins playing a regular beat (c. 1 stroke per sec.) and walks away so that the cho gradually becomes audible. He continues walking until he reaches a point at which the cho is heard exactly halfway between strokes (i.e. alternate stroke and echo make up an even half-second beat).

B (second player) then starts playing a regular beat synchronised visually with A's, and walks to a place twice as far away - i.e. where each stroke made coincides exactly with the echo from the previous stroke. Standing still at this palce, B then changes his beat to half tempo, so that alternate stroke and echo make up an even beat of 1 per sec. A, still synchronising visually with B (two strokes to every one of B's) moves out the same distance again, to a point the same distance as B from the point of echo. Standing still here, A also changes to half tempo. B. now doubles the tempo back to the original pulse of 1 per sec. and walks back to a point where the echo is heard after $\frac{1}{2}$ sec. A then also doubles the tempo to the original pulse, and walks back past B all the way to the starting point, and stops playing. B then also moves back to the starting point, and stops playing.

N.B.

The two players synchronise visually throughout, not aurally. Thus phasing of the pulse will be audible to each player as the other moves towards and away from him, and towards and away from the place where the echo comes from.

Taking the speed of sound as approx. 1,120 ft. per sec., the distance at which the echo is heard after 1 second is c. 560 ft.

Gavin Bryars has explored the physical aspect of temperature on musical repetition. His <u>The Heat of</u> <u>the Beat</u>, Verbal Anthology, is a bizarre repetitive piece

²⁴Visual Anthology, ed. Gavin Bryars, (London: E.M.C., 1973), p.7.

in which a group of performers aim to pursue constant pulse and a consonant Db common chord despite a wide range of temperature treatments. The variation from constancy in rhythm and tuning is achieved through these physical changes. The last half of the score states:

The piece should start homogeneously, say, with a footcount. During the performance auxiliary performers subject the various instruments to a wide range of temperature treatments (ice, fire, heating and cooling appliances, fans etc.) directly and indirectly applied, such as will not damage the instruments. Throughout the instruments maintain their consonance, re-tuning if necessary, and the piece may be terminated when the instrumentalist or the auxilliary performers decide that consonance occurs constantly. The piece may also terminate following illness, severe discomfort, or excessive perspiration odour from any performer.²⁵

Physical Actions As Performance Process

In Chapter 2 it was noted that machines could function like robots to activate sound sources. Machines can perform²⁶ but by far the greater number of composers have opted for human performance. Some have gone to great lengths to study the extent to which man can replicate in performance. Charles Amirkhanian and Peter Garland have both written pieces which utilize a simple repeated physical action as a means of making music. The simplicity of the action and device in each case allows time to perceive the repetitive

²⁶See discussion of Stephen von Heune's <u>Drum</u> in Chapter 2.

²⁵Verbal Anthology, (London: E.M.C., 1972), pp.11-12.

repercussions in the music.

Charles Amirkhanian's <u>Duet for Ratchets</u>, op.30 1966, utilizes the act of turning a simple mechanical device, the ratchet. This short piece is built around the relationship between two of these 'instruments' whose idiosyncracies influence the continuity and

variation possible in the piece. More properly called processing devices, their physical workings can dictate musical elements especially with regard to timbre and rhythm. The simple performance action and structure of the ratchet always remain in the foreground. All other musical features are extremely restricted.





27Garland, Peter, ed. Soundings 7-8, p.47.

A single pitch and loud dynamics prevail. What is interesting is the way the instruments overlap and the degree of deviation in the alignment of sound. Although each player turns three times per second "natural syncopation" can occur. The physical turning by the performers and the physical construction of the ratchets process the piece. Different performances by the same players as well as different performers playing the same identical ratchets as the first group, would provide interesting comparative data to enable one to study how much deviation is performer produced and how much is mechanically produced. The fatigue element over a three minute time slot with experienced ratchet players should not be of importance, as neither player plays continually. In an extended drone piece for bullroarer this may become an issue. The process required in performance then becomes physical rather than mechanical as it does in the Garland piece.

In Peter Garland's second song of the <u>Three</u> <u>Songs of Mad Coyote</u>, 1973, for two bullroarers and one lion's roar, the composer says the following in notes to the score:

The bullroarer parts are indicated by wavy lines. These instruments should be swung vigorously throughout the time length of the particular line. (Performers should practise this thoroughly so that their arms will not get tired!)²⁸

Despite the fact that the piece as a whole lasts only about four minutes, the skill in activating

²⁸Peter Garland notes to <u>2.Mad Coyote</u>, Soundings, 7-8, p.23.

the bullroarer on cue can be rather unwieldy as the sounding part of the twirling is difficult to organise on a precise command. Anybody who has ever played one of these knows what it is to go with the natural processing of the instrument rather than organising it. This is not to say playing on cue is impossible, but the speed of the attack depends on the performer, the weight and shape of the bullroarer, the length of string, the speed of swinging, and the acoustic of the performance space. Garland leaves this element open: "strict timings are not given in the score -- the performers are left on their own to approximate the given markings."²⁹ Graphic continuums in notation provide the flexibility to accommodate idiomatic features of bullroarer playing. The repetitive physical act is the dominant consideration of model and process. It is also an excellent means of processing the desired extra-musical intent as the text reads:

"Mad coyote

Madly sings

Then the west wind roars"30

There is something almost bizarre about the act of playing this twirling monster. Repetitive music in this case relies on repetitive physical actions by human beings. Bryars' investigation of temperature, Parsons, Lucier and Fontana's use of acoustic space and Reich's use of pendulums cannot be regarded as new or

²⁹Garland, op.cit., p.23.

30Ibid.



only being pertinent to repetitive music. Different types of physical processes and acts have been used by other composers since the 1950s and many other examples abound.³² Robert Ashley, Alvin Lucier, Max Neuhaus, Gavin Bryars, Dick Higgins, Nam June Paik have all

31Ibid.

exploited performance as physical acts and processes to different experimental, minimal or repetitive ends. The chosen examples, however, treat issues of repetition in performance very specifically.

The Human Body as a Physical Performance Processor

The extreme nature of the performance requirements demanded of performers of repetitive music cannot be denied. A particular physical energy is needed to keep tapping or droning, just as a directed mental outlook is required so that concentration does not collapse. The performer needs to be physically and mentally geared to continuity patterns which would be labelled mindless or obsessive by many traditional performers. Some pieces of repetitive music have dealt exclusively with the physical human requirements and can be treated rather like studies. They are pieces written to encourage the acquisition of certain skills such as motor control, co-ordination and contrapuntal layering techniques. For example, Peter Wetzler's Phasing Tune for Piano, 1977, is an exercise in developing left and right hand independence and skill in phasing. Movement shifting on a much smaller scale than commonly worked on by keyboard players is required. Shifts from 1 to 2, 3 and 4, mean the player must work at shifting the upper and lower modules out of synchronization so there is a certain cerebral

³²See the various volumes of the Californian Source Magazine and An Anthology of Chance Operations.

notation work required which is not so with written out music. (See Ex.7.6.)

The human body has amazing potential as a breathing machine. The psychomotor controls required for this piece, point to the mechanical and physical elements of human performance technique which need work on an individual basis in order for the music to be realised.

Ex.7.6, Peter Wetzler, Phasing Tune for Piano, 197733



PHASING TUNE FOR PIANO (an exercise for left & right hand separation)



REPEAT LISTENING CAREFULLY TO PATTERNS THAT EMERGE. SHAPE WITH DYNAMICS & LIGHT PEDALING. L.H. SLOWS CREATING 16th NOTE ATTACKS & THEN FALLS INTO SYNC ONE EIGHTH NOTE BEHIND R.H.



LISTEN TO THE NEW SET OF PATTERNS THAT EMERGE & GRADUALLY MOVE OUT OF PHASE SLOWING THE LEFT MAND. PRACTISE STAYING OUT OF SYNC THE TENDENCY IS TO SHIFT FROM ONE EICHTH BEAT BEHIND TO TWO, TWO TO THREE, ETC, WITHOUT PLAY-ING OUT OF PHASE IN BETWEEN. THE PIECE IS COMPLETED WHE N THE L.H. HAS SHIFTED 8 TIMES BACK TO THE BEGINVING. (8 to 12 MINUTES -1977 PETEA WETZLER



³³Ear Magazine, 5, No.1 (1979), n.pag.

The Human Performer as Process

The performer is an integrated life system using a complex network of systems in the service of music. In Chapter 2 many of the possible conscious and unconscious factors were articulated. In this Chapter the chief performers of repetitive music will be looked at in terms of their chosen working methods and performance style in order to provide extra insight into the performance of repetitive music and its structure.

Repetitive music in performance usually works on specific elements of human existence in depth. The body as an agent for motor control, the mind as an organ for sustained consciousness, collaborative relationships and spiritual belief systems have all been used as agents for extended repetition. In the discussion of particular performers and their chosen working processes it will be seen how the physical, mental, social and spiritual human factors blend. The following is an overview of human performance as process.34

The Individual - Terry Riley

Some individuals have opted for a solo independent path preferring to rely on their own resources. The most obvious example is Terry Riley. From the beginning of the 1960s, he has championed his

³⁴A more detailed study of one work with one ensemble is pursued in Chapter 8, 'Case Study'.

own style of repetitive music which is totally reliant upon his own personal skills and abilities as composer, performer and technician. Working directly at electronic keyboards and tape recorders, he sequences, permutes and groups different strands of pre-determined pitches, motives or scalic patterns, into labyrinths of sound which are peculiarly his own. Riley's sound is unique. The experience of a solo concert is almost spiritual. Riley, the person, is the music. He is indispensable to the making of the sounding event. A closer look at his performance style can help to identify some of the many processes at work in performance.

Performers are activators. Models are assimilated and run. In Riley's case the articulated models are minimal in the extreme and rarely made available for anyone else's information. In Dorian Winds and In C, pitch fragments and cells were made available with verbal instructions. Much more frequently, Riley mentally creates a scale or group of figures rather like 12 bar blues or the selection of a rag in Indian music. Interested in counterpoint and imitation, Riley gathers about him certain numbers of tape recorders, synthesizers and electronic gadgetry which define specific limits. Only certain combinations will be reproduceable according to the design of the music and numbers of speakers.
Riley's Models and Influences

Riley works as a composer-performer. To try to account for the pre-performance processing which goes on in Riley's mind is an impossible task. A reflective creative mind selects and stores certain things and discards others. The degree of freedom desired may influence the extent of pre-planning. This may or may not be a constant. Attitudes and needs change. Riley has an individual store of influences and skills which will now be briefly outlined.

In the 1960s his work with La Monte Young encouraged his desire to penetrate the internal nature of individual sounds and explore temperaments such as just intonation and related modal musics. Riley has been a pupil of Pandit Pran Nath, the Master Indian vocalist for many years as well as a jazz wind player on saxophone and clarinet. His twenty years working as a professor-musician-teacher in America, Scandinavia and Europe cannot be denied as a proven training ground in itself. He has become a master musician in the eastern sense from sheer dedication over long periods of time. His style has not radically altered. He has created an appropriate way of working for himself and he refines and changes it according to need and context.

In an interview with Robert Palmer in 1975 Riley explained this need for continuity and in depth experience in relation to his studies with the Indian master vocalist Pandit Pran Nath:

what studying with Pandit Pran Nath has done is made me go deeper into the thing I was already doing in order to try to make it more and more profound. The goal is to deepen the effect of the music, not just to do cosmetic work on it.35

His intention to also provide an elevating spiritual listening experience maintains this stance so that the audience can slowly become sensitised:

Sure I want to create a kind of hypnotic effect on the public. I want to create a kind of concentration on a musical idea so that people can go inside themselves and comfortably follow the development, until they slowly rise up and disappear into the clouds.³⁶

Riley is the first to admit that his music evolves through personalised experiential processing. In the 1970s after composing <u>In C</u> Riley pursued solo improvisation. Daniel Caux briefly sums up this pathway of Riley's evolution as follows;

il abandonnera la composition pour improviser en soliste avec feedback - son orchestre fantôme - sur les thèmes Poppy Nogood et Rainbow in a curved air. Se servent de moins en moins du second instrument [le saxophone soprano], il se consacrera exclusivement dans les années 70 à l'improvisation a l'orgue, ajoutant à son repertoire des morceaux tels que Persian surgery dervishes et The Descending Moonshine Dervishes, dont il donnera ainsi que de l'inépuisable Rainbow, des versions hautement diversifiées, mêlant des échos de la musique ancienne baroque, du ragtime et du raga Indien dans une musique dont l'atmosphère inimitable ne doit qu'a lui-meme.³⁷

35Robert Palmer "Doctor of Improvised Surgery", Downbeat, Nov. 20th, 1975, p.19.

36Ibid.

37_{Daniel Caux,} "Le Grand Rendez-vous des <<Repetitifs>> Americains", <u>Le Monde</u>, 21 Octobre, 1976, p.21. Certain constants can be identified in Riley's work. Working interests and working tools can be articulated.

1. <u>Interest in continuity and getting inside the sound</u>. This he attributes time and time again to early experiences with Young and the dancer-choreographer Anne Halprin. He wants to slow down the pace and savour particles. He uses drones.

2. Interest in tuning in just intonation particularly in Dorian Mode. Two sets of tones and their dominants are tuned on the Yamaha Organ so that when 'beating', a second and a half passes in time. This causes a shimmering effect like a type of phasing.

3. <u>Fixing of set melodic figures</u>. E.g. the Dervish set uses F, B, A^b and D. Over time, added pitch-mode centres become plateaux.

4. Interest in counterpoint and imitation in assembling material.

5. The <u>pulse</u> being a constant relating to biological factors, which work perfectly in time as tuning and temperament do for pitches.

Finding the right pulse rate ... at the beginning, this is tuning up time, sometimes takes as much as half an hour. I've been working essentially with time and a lot with pitch, the pitch is very important.³⁸

38Keith and Rita Knox, "Relax and fully concentrate: the time of Terry Riley", <u>Friends</u>, No.3 (1970), n.pag.

Dervish Improvisations he says:

I tried to tie it together into an overall rhythmic structure; that slow underlying beat you hear in the left hand is a 16 beat basic pattern. I use the tape recorder to give me an echo, one delay after the original signal, and I integrate that into the melodies and patterns that I'm playing. I work out a series of interrelated patterns within the mode that are varied with constantly shifting alignments. That is, I move the patterns against themselves, and sometimes I do the same thing with one hand playing double speed. One of the patterns in <u>Persian</u> <u>Surgery Dervishes</u> is 40 beats long, and when you start moving that one around against itself it becomes pretty difficult.³⁹

7. <u>Act of performance</u> - Compositional tools are idiomatically derived from performance activity. Even with tape he prefers to work with real time factors rather than with prepared and assembled material.

8. <u>Virtuosity</u> Like a Jazz Musician, the virtuosity is there but must be able to be challenged and thrown to the winds.

Riley engages in a holistic working process. Motor control, compositional skill, spirituality, fine articulation, methodical electronic processes, physiological constants, all fuse in real time. Riley is a very special composer-performer of repetitive music. In his case one feels that the music of Terry Riley, a humanly generated living process music, is barely comfortably treated in the repertoire of repetitive music. Riley has forged his style, from the outset. Models are reduced to almost nothing even before the 1960s. In a piece for and titled La Monte,

³⁹Ibid.

he says "I am getting to think instructions take some of the magic out of the piece."⁴⁰ Young's solitary obsessiveness also comes to mind in a discussion of individuality but it is Riley who emerges as the utterly self-reliant and totally independent composerperformer.

Groups

Just as Riley has adopted a performance mode and musical style based on individuality, other composers have been drawn to the duo or group situation. The working methods and priorities of most ensembles are an essential part of repetitive music in process.

Steve Reich and Musicians

For Reich the shift from physical processing to people processing was a conscious decision that he has documented carefully in <u>Writings</u>. However, for him the new move towards ensemble performance was still concerned with original principles of processes with a high degree of rigidity and slow gradual change. It was not a situation which gave freedom to individuals. Starting with school-time friends, Art Murphy and Jon Gibson, a steady ensemble outlook developed, as the two quotes show.

⁴⁰Terry Riley in <u>An Anthology</u> eds. La Monte Young and Jackson Maclow, n.pag.

A performance for us is a situation where all musicians including myself, attempt to set aside our individual thoughts and feelings of the moment, and try to focus our minds clearly on the realization of one continuous musical process.

John F. Kennedy Centre for the Performing Arts,

Washington D.C., May 1974.

As a performer what I want is to be told exactly what to do within a musical ensemble, and to find that by doing it well I help make beautiful music. ... The pleasure I get from playing is not the pleasure of expressing myself, but of subjugating myself to the music and experiencing the ecstasy that comes from being a part of it.41

Reich's interest in rhythmic detail, and since 1970, in timbral blending, led him to seek out performers with expertise in these special areas. Russ Hartenberger and James Preiss are outstanding percussionists who have played with Reich for over ten years giving pieces like Music for Mallet Instruments, Voices and Organs, Six Pianos, and Drumming, special life and cleanliness of articulation. This is essential if the vertical layering of different parts is to be audibly clean and recognizable. The singers Joan La Barbara, an excellent composer-performer in her own right and Jay Clayton, had the intonation and blending properties Reich was looking for. In 1971 Reich coined 'Steve Reich and Musicians' as the name for a group of players committed to the performance of The members rehearse pieces over a long his music. time span and make suggestions and choices of detail within the set musical limits.

⁴¹Reich, <u>Writings About Music</u>, p.44.

This amount of rehearsing allows for many small compositional changes while the work is in progress and at the same time builds a kind of ensemble solidity that makes playing together a joy.⁴²

Reich was quick to realise that a type of performer different from the traditionally trained musician was needed for this music. Generally musicians with experience in performing non-western music, free jazz, or medieval music, as well as the classical western tradition, had the creative and performing skills he wanted. New players and new sonorities require that new performance variables be solved. In <u>Music for 18</u> <u>Musicians</u>, Reich details the type of interaction which happens between xylophone, high piano and two bass clarinets. Three elements, strict twelve beat bars, the pulsing of a breath length cue and unfixed numbers of repetitions have to be reconciled.

The only way to deal with this flexible situation is to rehearse and then you find out that maybe you've got to take a very long breath and then pause a bit - they begin to pace each other so that it becomes a very musical process. There's a bit of visual cueing between them, eye contact. In fact, it's really a classic example of what goes on in chamber music at all times, ... in other words those four guys [Russ Hartenburger, Steve Chambers, Les Scott and Richard Cohen] have to work together during this particular part of the piece and there's no way of notating it that won't rob it of its life, ... it's written in the score, but how long is a pause. ... The piece is chamber music ... everyone has to be on their toes for 55 minutes to play <u>Music for 18</u> Musicians.⁴³

⁴²Steve Reich, p.48.

⁴³Michael Nyman, "Steve Reich", <u>Music and</u> Musicians, 25, No.5 (1977), p.19.

As Reich's music has tended towards using larger instrumental forces, such as the forty players used in Music for a Large Ensemble, 1977, the concept of a set ensemble has become much less exclusive. Since the huge score contract with Universal, Reich has considered writing more and more for traditional instruments and techniques. Some later music concentrates on timbres involving string and brass sonorities which are positively symphonic. Reich states in 1982 that "things are changing" and that the new season with the New York Philharmonic would open with a piece of his. Symphonic commissions rarely produce the type of music which can be crafted over a long time span by a devoted empathetic ensemble of creative musicians. Performance variables differ. Compositional intent and models chosen to bring them about often change with practical conditions. The extent to which Reich can carry over his responsible conductorless chamber music style into the symphonic idiom remains to be seen.

In recent correspondence with Reich concerning <u>Tehillim</u>, the composer points to the impact of the conductor and length of rehearsal time as being even more important than the composition of the group, whether student, composer-performers or symphonic:

The New York Philharmonic performance suffered from only five hours of rehearsal. The ensemble really was learning <u>Tehillim</u> in performance. Since then it has received excellent performances by members of the San Francisco Symphony conducted by John Adams and by students at California Institute of the Arts under Stephen Masko. It will be done this July 1983 by students at the Aspen Festival under Barry

Jewkowsky. Denis Russell Davies could have had a good performance with members of the Chicago Symphony this past summer of 1982 but they suffered the same lack of rehearsal time. My feeling is that any conductor who has a taste for Stravinsky, Haydn and other rhythmically marked music can do a fine job of <u>Tehillim</u> with adequate rehearsal.44

The Philip Glass Ensemble

From time to time in the early days of Steve Reich and Musicians, Phil Glass was a member. So too was Jon Gibson. It is not surprising that Phil Glass also settled on a group of steady musicians some of whom played in both ensembles at different times. Glass's ensemble sound usually is of a fixed instrumentation from piece to piece, being for electronic organs with a predeliction for rigorous motor control and fast tempi. A special kind of tenacity and high energy threshold is essential for the performer of Glass's music. In many early works, adrenalin dramatically pushes forward great chunks of the music. This can be verified by anyone who has seen Robert Ashley's video of Glass performing in the series "Music with Roots in the Aether".45 The incredible mental, physical and emotional exertion of the composer can hardly be divorced from the listening experience. Glass has moved more in search of the sound itself, and

⁴⁴Recent correspondence from the composer through Reich Music Publications, March 15, 1983.

⁴⁵Shown in 1976 Paris Autumn Festival at the American Cultural Centre. Entitled "Music with Roots in the Aether" "Video Portraits of Composers and Their Music" by Robert Ashley, Performing Art Services, Inc., 463 West St. N.Y., New York.

the secondary acoustic phenomenon that invariably occurs in repetitive music, with much doubling at the octave and the fifth, and high amplification. The importance of the amplified image in relation to the performing acoustic has become so important to Glass that the electronic engineer Kurt Munkacsi was made a permanent member of the ensemble. The composer's statement verifies this:

In recent years, the music has moved from a primary interest in structure to preoccupation with the sound and presence.... In this regard the development of a four channel sound system with highly flexible mixing possibilities by Kurt Munkacsi, has given the ensemble a unique mode of presentation. Further, the high volume of the sound, coupled with the extremely low distortion has made it possible for the psycho-acoustical aspects of the music to emerge with great clarity so that now the character and quality of amplified sound seem to serve as a sub text to the structure (as essence) of the music itself.46

Just as physical verve and high amplification are essential to Glass's style, spiritual processes are important for other ensembles such as La Monte Young's 'Theatre of Eternal Music' and the 'Prima Materia'.

The Theatre of Eternal Music

La Monte Young's 'Theatre of Eternal Music' is the composer's continuous musical experience in tuning and sound vibration. La Monte Young is mostly assisted by his artist wife Marian Zazeela, who from time to time sings certain frequencies, helps prepare the keyboard for <u>The Well Tuned Piano</u>, 1976, and provides

⁴⁶Philip Glass, <u>Music in Twelve Parts</u>, Philip Glass Ensemble, Virgin Records, CAZ010, 1974.

calligraphy and lit mobiles for the latter piece. From time to time Terry Riley collaborates and in the early days, John Cale played viola and bowed gong. Young's concept of the continuous drone <u>Dream House</u> demands a 24 hour a day commitment to his idea of continuous sound vibrations. For him this becomes linked with endless celestial, mystical and temporal continuities.⁴⁷

The singing of drones and harmonies have often been linked to spiritual phenomena in both the history of western music and various world musics. Tibetan and Mongolian chant have been sought after models by many artists pursuing drone music.

The Prima Materia

The influence of spiritualism and the techniques of Tibetan and Mongolian chant are the acknowledged forces behind the Prima Materia's work as the following programme note reveals.

Wir arbeiten mit Vokalklängen hochkomplexer Natur,... harmonischen, gefilterten, multiphonen, mit ausgeweiteten Klangumfängen, Jodeln usw. Einige Techniken wie auch die Ideen der Mantra und das Summen sind aus den musikalischen Traditionen von Nordindien der Mongolei und Tibet hergeleitet. Es wäre trotzdem ein Fehler, das Augenmerk auf isolierte Töne zu richten, denn was zählt, ist der einheitliche Erscheinungscharakter von solch verschiedenen Techniken in einer Synthese, die zeitgenössisch in der Technik aber archaisch im Geiste ist. Musik, die alles Unwesentliche abgestreift hat, lässt die ursprüngliche, primäre Schwingung wieder entdecken. Nur durch innere Suche

⁴⁷See Chapter 3 for a more detailed discussion of the Theatre of Eternal Music and its repertoire. Also Chapter 9, The Well Tuned Piano.

können wir selbst Resonatoren und Träger der universalen Schwingung werden.⁴⁸

The group works as a yoga based vocal drone ensemble founded by Roberto Laneri in San Diego California in 1973 and now based in Rome, Italy. In his Ph.D thesis entitled "Prima Materia: An Opus in Progress.. The Natural Dimension of Music" Laneri traces the relationship of consciousness and irrational forces in music.

His general thesis is to return to the ancient primordial sound as a basis of personal and musical reintegration. With egoless attention and an open nonassertive listening awareness, it is possible to contact deep states of consciousness. The Prima Materia deals with improvisation of the voice as a conscious and unconscious point of convergence and contact between the members of the group. The flow and transformation of energies are set in motion, allowing an unbridled osmosis to occur. Between performers, the divine becomes the actual. The marriage of body and soul, of sound and prana (breath), draws from and recreates an enlightened state. The spiritual process of music making is the model and process. It occurs as an irrational state of being, listening and meditating. It is sound through allowance rather than directional product shaping. Mental states allow inhibitions to be released, filtering systems to stop and information to

⁴⁸'Pro Musica Nova', Music Festival Catalogue, Radio Bremen, 1976, p.27.

follow its own pathway. The nervous cells are allowed to react to one another. It works on the flowing of time as it is humanly perceived, not measured. Musical time is experienced as the eternal present.

The distribution of energy and different layers of tension are described as being in three possible states; each one only being possible after the other. The performers must interact and realise when one person enters a new phase so that the energy level can be supported by the whole group. The collective consciousness can maintain or change the three levels, working through the first phase of centering the sound and opening the gates of consciousness, to maximum concentration of the centre through the descent which follows the choice to terminate.49

The effect of timelessness is the experience which cannot really be quantified or measured. Yogic meditation, fasting, posture, deep breathing, and the technique of singing overtones are the physical means through which the experience can happen. Natural vocal overtones characterise <u>Prima Materia's</u> sound, free of all electronic manipulation. Body resonances and vowel shapes articulate the drone bringing different overtones into view from the base of the spine to the top of the head. Laneri's basic <u>om</u> mantra, often covers a minor third and it subtly changes and

⁴⁹For a full description see Roberto Laneri, "Prima Materia: An Opus in Progress. The Natural Dimension of Music," Diss. UCSD, 1975, p.80.

continues according to the ensemble relationship.

Ex.7.7, Prima Materia, The Approach to the Mantra⁵⁰

М	top of head	dreamless sleep
I	space between eyes	
Е	throat	
A	chest	waking
0	centre chest	
U	base of spine	dream

In notes to the 'Tail of the Tiger' the great quote of the Upanishads sums up the spiritual dimension of the performance practice required:

Verily, there are two Brahmans to be meditated upon: Sound and non-sound. Now, non-sound is revealed only by sound ... This indeed is the way. This is immortality. This is complete union and also peacefulness. 51

The Scratch Orchestra and the English Approach

In a group like Prima Materia individual differences and ego centres are subjugated. By way of contrast many English groups which formulated in the time of Cornelius Cardew's <u>Scratch Orchestra</u> chose to utilize individual differences as a way of processing

⁵⁰Ibid.

⁵¹Prima Materia, <u>La Coda della Tigre/Tail of</u> <u>the Tiger</u>, Ananda 2, recorded by Alvin Curran, March 6, 1977.

music. In Cardew's Anthology <u>Scratch Music</u>, the ideas behind the collective act of compositional activity are detailed and the works of sixteen people collated. Founded by Michael Parsons, Howard Skempton and Cornelius Cardew in 1969, the Scratch Music and Activities provided a training ground for peoplecentred performances, compositions and activities:

Scratch Music is a method of uniting a group of people. Anybody can write and play it, it can be used in education at all levels. The superficially private and individualistic quality of Scratch Music must be seen in prespective [sic]. It fosters communal activity, it breaks down the barrier between private and group activity, between professional and amateur, it is a means to sharing experience.⁵²

It is hard to imagine any discussion of English Repetitive Music without considering Cardew's Scratch Music as an important influential field of activity. Clearly many pieces are not repetitive and cannot be discussed within the context of this thesis. Yet in the history of the performance practice of new composition, this body of work is a major seminal Nor are the publications Scratch Music, the force. Scratch Anthology of Compositions or Scratch Music totally divorced from repetitive music. Minimalism, extended continuity, repetition and experimentation are important features. The point at which some pieces and activities can be classified as 'repetitive' is often arguable and not always constant depending on the realisation or changing context.

⁵²Cornelius Cardew, <u>Scratch Music</u>, (London: Latimer New Dimensions, 1972), p.16.

Item one of the draft constitution outlines that many musical accompaniments should be composed by each member of the orchestra and that they be "performable continuously for indefinite periods"53 Item two, the 'Popular Classics' recommends the playing of familiar works in whole or part. They should be put together in a form of reconstruction reliant on the player's memory and recall. If this fails, then gaps may be filled with improvisational variation material aimed at reinforcing the identity of the piece rather than departing from it. Pieces listed in Appendix 1 of that source include Beethoven's 'Pastoral Symphony', Mozart's 'Eine Kleine Nachtmusik', Rachmaninov's 'Second Piano Concerto', Bach's 'Sheep May Safely Graze', and works by Cage, Brahms and Schoenberg. The practice of reconstructing familiar pieces was taken up in many ways by the Portsmouth Sinfonia and the Majorca Orchestra as well as Scratch. Nostalgia, familiarity and personal participation are identifiably 'English' traits when compared to the American process composers. The tonal basis of these examples of Western Music was rarely neglected. It usually served to bind a simple model together and increase the predictability. A fairground atmosphere of mutual support was established. The stage was set for creative work in many directions but with an obvious opportunity for in depth pursuit of singular objectives and extended continuities.

⁵³Cardew p.14.

Each piece of Scratch Music should in theory be performable continuously (whether agonizingly or enjoyably depends on the type of person doing it and on the mood he is in) for indefinite periods of time.54

Yet flexibility and individuality are constants in the composition and performance of this music and they act as moderating influences on rigour or exhaustive processes. Personal oddity, amateurism and a certain 'quaintness' often prevail. Christopher Hobbs, Hugh Shrapnel, John Tilbury and Gavin Bryars have shamelessly based many of their pieces on the music of others.

The Portsmouth Sinfonia

A group centred around Gavin Bryars and staff in Fine Art at Portsmouth Polytechnic was entirely devoted to the performance of 'classical' music which had been defined popular in other times. The varied ability of these ad hoc musicians-art students and their lack of musical training and expectation, allowed the performances to take on a naive and innocent 'encounter' to quite humourous ends. Lack of competence shapes and articulates familiar, predictable music, in new audible ways. This level of performance processes the composition in ways that seem outrageous to the musically trained. Out of tune playing, poor rhythm, lack of ensemble, dropping out for a while, mistakes, seem to feature. These are unwanted factors in traditional music. New ears and new expectations

⁵⁴Cardew, p.14.

are needed to cope with this type of repetitive music. It is old music reconsidered.

The two orchestras Ross and Cromarty Orchestra and the Majorca Orchestra were similar in that their pieces were simple tonal works of 8-16 bars based on simple 3-4 chord diatonicism. This music was easy to play, familiar, predictable and therefore accessible. Instrumentalists in any combination could build up the texture sequentially and the orchestral blending possibilities were organized in a way which caused subtle variations of the repeated tune.

The Ross and Cromarty Orchestra

This was established by Ivan Hume-Carter in order to perform his music. Traditional orchestral players, and instruments were heading for traditional compositional method. James Lampard describes it this way:

Looking back, this step was similar to Feldman's discovery that music could be written in three pitches: high, middle, low. In Portsmouth these became melody, accompaniment and bass.⁵⁵

The Majorca Orchestra

This was really a spin off group after the Ross and Cromarty had disbanded and Carter had withdrawn his music from publication and performance. Robin

⁵⁵James Lampard "Fine Art Orchestras", <u>Musics</u>, No.12, (1977), p.10.

Mortimore, Ian Southwood, Brian Watterson, Dave Saunders and James Lampard took up the simple three layer compositional method and subjected old tunes to various repetitions.⁵⁶ Typical patterning procedure was as follows; flute and violin play the melody, glockenspiel plays chords off beat, and tenor horn and double bass play on beat. This became the Majorca sound and performance style, repeated in numerous original compositions and reworkings of Ezra Read tunes. Lampard's discovery of simple Edwardian house music, particularly the simplicity of the Ezra Read tunes became a seminal influence on attitudes towards repetition and reconstruction.57 The Ezra Read Orchestra also emerged in Portsmouth, founded by Michael Parsons and his students.

The importance of Portsmouth as a centre of growth in the late 1960s and early 1970s can hardly be ignored. The presence of part-time lecturers of the calibre of Gavin Bryars, Michael Parsons and John Tilbury and visiting lecturers such as Cornelius Cardew, George Brecht, Morton Feldman, Christopher Hobbs and the Scratch Orchestra was made possible by the Portsmouth Fine Art Department during this time. The interfeeding between groups and people was open and supportive. Music was a communal activity. In 1973 when the Portsmouth Sinfonia was recording its first

⁵⁶See Chapter 4.

⁵⁷See details of this composer's output in Lampard's article, p.11.

record⁵⁸ at Wimbledon, the two orchestras, the Majorca and The Ezra Read combined their resources and staged a benefit concert for them.

The English attitude of working which underlies all the groups is summed up by Hugh Shrapnel "the value of the Scratch is the spirit of working together and the mixing of musicians with people working in other fields. To work in isolation would be unthinkable.⁵⁹

The P.T. Orchestra

The Promenade Theatre Orchestra, consisting of Chris Hobbs, John White, Hugh Shrapnel and Alec Hill, worked within this happy spirit of acceptance but channelled the musical material through more rigourous disciplined processes. They came to be known as 'systems' and 'machines'. The blend of sentimentality and discipline is obvious from their advertisement. (See Figure 7.2.)

Taking music out to the community and different spaces was essential to the Promenade. Nyman attributes the renewed interest in discipline to John White's reaction against Cardew's <u>Treatise</u> in the 1960s. White, a seminal figure in pioneering the idea of the ready made, and found music, used processes in a machine-like way.

⁵⁸Details unavailable; out of print.

⁵⁹Michael Nyman "Believe it or not Melody Rides Again", <u>Music and Musicians</u>, 20, No.2, (1971), p.28.

FIGURE 7.2

P.T. Orchestra Advertisement⁶⁰

The P.T. Orchestral The orchestra YOU can afterd for that extra a seculoa! Restful reed-organs, tinkling toy p ands southing proteries, surve swence whistles, jally jews herps - NO naisy electronics! (Just the job for that lazy Sunday afternoon!) 0 ical meterial guarante d thru-come All me NO hit-or-miss improvisation! ot find out more shout the P.T. Orchestra's wenderful programmes from John White, 18A Thornton Rd, SW 18 or ring 847-3447

The sound and the activities of the performers are fed like raw materials into a machine or process and emerge as a pattern unique to the occasion on which the particular machine is being performed. The sounds tend towards a sort of ragged consonance. The procedures usually involve music repetition with changes happening almost imperceptibly over large spans of time, and the atmosphere is usually pretty calm and unruffled however fast the pace of the music.

There is no doubt that the composition of ensembles, orchestras or groups of musicians plays a great part in both the selection of music and how it is

⁶⁰Contact, No.3, (1971), n.pag.

61John White in Nyman, <u>Experimental Music</u>, p.143.

made. If the ensemble has a conductor or composer centre, then a common point of energy flows from a central radius outwards to the players by agreement. Tastes, style and performance are directed through a single entity. Ensembles around Steve Reich, Phil Glass, La Monte Young, and Michael Nyman fit into this category. The Scratch Orchestra, attempting to be democratic, ultimately fell because of the unwritten feeling that Cardew was a subtle benevolent leader.62 The political components of music as a social phenomenon and then as an agent for political change led to the splinter faction, the Ideological Group. Certainly from this point onwards, in 1972, Cornelius Cardew and Frederick Rzewski were independently devoted to political music, an extra-musical aim which may or may not yield repetitive music.

Composers as Performers

It is interesting to note that almost all composers of repetitive music have chosen to be directly involved in the performance of their works. If they weren't always involved as composer-performers, they made every effort to develop the performing skills to play along with other musicians. Glass and Reich state this quite clearly. La Monte Young, Chris Hobbs, John White, Gavin Bryars, always perform their own

⁶²See <u>Scratch Music</u>, p.12. This was compounded by discontent and the changing focus amongst some members.

music. This removes the dislocation often felt by the separate development of composer and performers having distinct individual roles. These holistic acts of composer-performers eliminate a step of information transference, and return music to its basic function as a physical as well as cerebral art form. The idea of an ensemble of composer-performers was hardly a new idea. Since the 1950s as a result of people like John Cage, Lukas Foss, Pauline Oliveros and Robert Ashley, small performance groups giving much creative power to the performer, have flourished in the United States and elsewhere. Some groups tend to work towards rigour, others towards freedom. Some are democratic, others composer-centred. Some are devoted only to their own music, others only to repetitive music. Others are more in the new music ensemble tradition.

Apart from the well-known American and English groups, similar groups have spread throughout Europe, Australia and New Zealand. Louis Andriessen's Dutch group <u>Hoketus</u> has established a loud and agressive performance mode having audible links with Jazz and rock 'n' roll. Phil Dadson's <u>From Scratch</u>,⁶³ New Zealand and the Australian groups from Melbourne <u>LIME</u>,⁶⁴ <u>Plastic Platypus</u>, <u>Music 4</u>, and <u>I.D.A.</u>, have all worked extensively but not exclusively with repetitive music. The New-Wave set of Australian groups,

⁶³See Discography, Phil Dadson, <u>From Scratch</u>. ⁶⁴LIME, <u>Faces in Different Places</u> and <u>Soft and</u> <u>Fragile</u>.

including David Chesworth's <u>Essendon-Airport</u>, 65 and $\rightarrow ^{^{2}}_{^{66}}$ have merged repetitive elements with rock and roll in new contextual frameworks. In Adelaide, South Australia, the <u>Robert Lloyd Ensemble</u> is a composer centred group devoted to the performance of Lloyd's own repetitive music.

Several composers have grouped together in duos and trios when common objectives have been found, such as the Christopher Hobbs, John White duo. Their performances of percussion music performed in the Summer of 1973 at the Lucy Milten Gallery, bear the influence of earlier work with systems and machines of the Promenade Theatre Orchestra, during 1970-71. Their collaboration as a duo led to the publication of the <u>Duo Percussion Anthology</u> in 1973 by the Experimental Music Catalogue. The Australian duos of two composers, Ron Nagorka and Warren Burt, and Sarah Hopkins and Ros Bandt⁶⁷ have performed many and varied repetitive works, but each has worked individually as a solo composer-performer.

Jon Gibson's solo instrumental work is well known. He has worked with Steve Reich, and in the 1970s and 1980s, and has been a member of the Phil Glass Ensemble. He does many solo performances and recordings of his own work as well as being a leading

⁶⁵David Chesworth 50 Synthesizer Greats. 66 , New Music.

⁶⁷See Discography.

Performance as Combined Processes

The quality of performance is crafted in real time by musicians. Tasks vary from composing on the spot, reproducing someone else's piece, to realising an individual pathway through set norms. Repetitive music emerges from different performance modes. A few examples illuminate the differences. The professional percussion group, The Blackearth Percussion Ensemble, USA, can deliver a clean version of Rzewski's Les Moutons de Panurge. Steve Reich's group works original pieces up over a year or so with the composer slightly changing and refining composed pieces. Members of the Portsmouth Sinfonia work through other people's music in the best way they can, happily accepting the results of limited performance ability. La Monte Young's ability to hear subtle frequency relationships during performance time allows him to pace his compositional ideas.

The above discussion of groups has served to outline some important contributors to repetitive music. The organization of groups, the members, ideology and practical working routine ultimately effects the musical product. Human processes become musical ones. The realisation of repetitive music by groups or individuals reinforces music as a social

⁶⁸See Discography.

activity not only from performer to audience but between the performers themselves. In certain repetitive pieces these relationships become indispensable. My own ensemble L.I.M.E. could not possibly perform the piece Shifts if one member were absent. The music depends upon hocketing techniques which are shared through structured improvisation without notation. Each performer over the space of fifteen months has worked inside the piece and through oral tradition it comes together as a result of the interaction and individual contributions of the four players.⁶⁹ Sometimes an individual seems indispensable such as Jon Adams relationship with the San Francisco Conservatorium New Music Ensemble in the early 1970s. Other ensembles can change their membership without altering the music. The role of the individual and the group are important human factors in performance processing.

An Overview - Conclusions

It would be simplistic to suggest that any part of this Chapter is exclusive. Performance situations involving various combinations of physical, electronic, human and mechanical elements are the most common. Nor is the individual/group situation always a bipartite choice. Most works utilize many processes. John White's <u>Drinking and Hooting Machine</u>, 1971 is a work

⁶⁹Detailed discussion of this work in <u>Soft and</u> Fragile, See Discograhy.

which combines many elements and concepts in a unique way.

- A physical process is enacted by humans, sipping out of a bottle and blowing across the top.
- 2. <u>Individuality of performer</u> is intended to (a) give variety to the articulation of the four prescribed methods of drinking - sip, gulp, swig and 'as is', as well as (b) pacing the piece in individually determined counterpoint as each player moves through the material at his/her own rate.
- 3. The <u>'group' ethic</u> is also adhered to as the performers are divided into four groups, each with a different part.
- 4. <u>Machine</u> White's term for the rigour of the method set up. It requires real-time processing to be made audible and could be considered a trigger for action.

In Michael Nyman's language, White's 'Machines' are 'conveyer belts'⁷⁰ through which individual differences and human activities are passed. The resulting music from this amalgamated process is slow and drawn out with much repetition and small changes.

Performance as process in repetitive music, as in all music, brings the projected and crafted sounds into the listener's experience. The processes and performance modes chosen vary considerably in type. They may be physical, mechanical, electronic, human or

70Michael Nyman, Experimental Music, p.144.

spiritual. The degree of rigour with which they are applied also varies. This Chapter has sought not only to identify these types and their applications in repetitive music but also to give status to the merging of real time processes.

Performers carry the repetitive techniques and action through time. Many pieces of repetitive music are specifically concerned with time related repetitive process. In performance time, composition is brought into the present in an audible way which shapes all the detail.

CHAPTER 8

MODELS AND PROCESSES:

A CASE STUDY OF JON GIBSON'S MULTIPLES.

It has been pointed out that the relationship between model and process can be varied and complex. Models and processes can be mutually exclusive or interdependent. The extent to which the relationship is symbiotic needs to be seen against a particular context or a specific performance because even within one piece, models and processes can be variables in defining musical grammar and syntax. A comparison of versions of one work, <u>Multiples</u> by Jon Gibson, serves as an interesting control in studying the way models and processes may interrelate and how they can influence the musical results.

Performance practice involves many variables which are often very difficult to assess in terms of specific criteria. In order to view more closely the musical interrelationship between models and processes in the piece, certain organisational norms were fixed as constraints. These included the selection of a group of performers who could attend all sessions, the use of the same recording studio with the same instruments being available, and the same nightly

rehearsal time and length of sessions. These fixed elements became useful controls against which other variables could be more easily identified.

The Piece

Jon Gibson's <u>Multiples</u> of 1972 was chosen for several reasons.

- The numerical matrix which is the basic score or notated model was simple and systemic.
- It is for an unspecified group of instruments with recommended instrumental combinations which were available to me.
- It allowed flexibility of treatment within a repetitive framework.
- 4. It is a fairly representative piece of repetitive music having elements such as the pulse, phase, mathematical systems, free variation and a fixed pitch series.
- 5. There are no commercially available recordings so it afforded the opportunity for some original, unbiased interpretation.
- 6. The composer Jon Gibson has worked within repetitive music since the early sixties and has been exposed to all current trends, having worked with Reich and Glass, as well as doing his own composer-performing.
- 7. He was amenable to the idea and generously supplied important working information and details on several occasions.

The Score as a Model

In considering the relationships between models and processes it is valuable to look analytically at the score itself. It can be considered as a written model which defines certain musical constructs and activities. Constants and variables are projected in the score. Just as interesting are those features not defined. A close examination of the numerical matrix reveals the following:-

1	I	I	II	W	Y	VI	VII.	YUI	IX	X
D	1	16	6	2	24	8	3	48	12	4
C#	2	24	8	3	48	,12	4	1.	16.	6
F#	3	43	12	4	1.	16	6.	2	24	60
E	5	1	16	6	2	24	8	3	48	12.
B	6	2	24	8	3	48	12	4	1	16
A	S	3	4.8	12	4	1	16	6	2	24
G#	12	4	1	16	6	2	24	8	3	48

Ex.8.1, Score Matrix of Multiples, Jon Gibsonl

The title <u>Multiples</u> refers to the basic numbers chosen being multiples or factors of 48. 1,2,3,4,6,8,12,16,24.

¹The score of <u>Multiples</u> was kindly lent by Dr. Richard David Hames, School of Music, Victorian College of the Arts.

It is a score which defines pitch material (D, $C^{\#}$, $F^{\#}$, E, B, A, $G^{\#}$) and the rhythmic pulse. Travelling from left to right, top to bottom in a vertical direction, the numbers beside the pitches indicate the number of pulses for that pitch. The basic pulse is a common denominator throughout. Thus a transcription of the first line would be :

Taking the model at face value, it can be seen that the sum of the beats for each pitch is the same; each horizontal axis adding up to 124 beats. Therefore, each pitch has the same status in a way which detracts from the tonal functions of A major which the pitch sequence seems to suggest. Looking at the musical material contained in this pitch series, several recurring intervallic motives can be seen.



Tones and semitones are set against intervals of a fourth and fifth. Octave displacement is not indicated on the score and is left up to the performer. Numerical Sequence and Pitch Occurrence

The ten numbers 1,2,3,4,6,8,12,16,24,48, occur in the same sequence seven times in the matrix spread over ten columns relating to seven pitches. In order to find if any of these columns had a particular identity or not, the pitch number sequence for the matrix have been graphed so that their sequencing can be reflected upon visually not numerically. See Figure 8.1.

From the graph the pitch which occurred with the greatest frequency for each section was found to be:

TABLE 8.1

Section	Pitch		
1	G#		
2	F#		
3	A		
4	G#		
5	c#		
6	В		
. 7	G [#]		
8	D		
9	E		
10	G#		

Dominant Pitch Occurrence in Multiples

FIGURE 8.1

Graph Of Pitch/Rhythmic Intersection Implied From The Matrix of Jon Gibson's <u>Multiples</u>



 $G^{\#}$ in columns 1, 4, 7 and 10 is the dominant pitch occurrence which gives continuity and symmetry harmonically. Each of the other sections has a different dominant pitch occurrence. Section 2 - $F^{\#}$, 3 - A, 5 - $C^{\#}$, 6 - B, 8 - D, 9 - E. A feeling of tonality of A is contained in the model although certain ambivalence between major and minor chords and intervals can be seen between sections.

From the given pitches the possible chords can be assembled.

B D F[#] A - b min #5 7 D F[#] A C[#] - D maj 7 E G[#] B D - E maj 7 A C[#] E G[#] - A maj 7 C[#] E G[#] B - C[#] min 7 F[#] A C[#] E - F[#] min 7 G[#] B D F[#] - G[#] min 7 A B C[#] D[#] E F[#] G[#] A maj min min maj maj min min

Length of Sections

Each section, as well as having an individual dominant pitch, is of its own length. None of the columns add up to the same number of pulses. Sections one and four are particularly short due to the absence of higher numbers. This is of little consequence in itself when subjected to the processes of the piece. The identity of the piece is shaped by the seven groups and which part of the pitch row they emphasize

individually. For example, in the first set of numbers D C[#] and F[#] are over half the total number of counts for the set being repeated. The second set emphasises E B A, the third G[#] D C[#], the fourth F[#] E B, the fifth A C[#] D, the sixth C[#] F[#] E, and the seventh, B A G[#]. These then become seven different identifiable sets of pitches which work rather as a successive cycle through the pitch series in order to bring different pitches together at certain times.

The model then defines the number of pulses to a pitch, the pitches themselves, and their sequence. There are seven repetitions of the same number of pulses per beat. Speculations can be made about possible outcomes of unspecified aspects. For example, it is possible to project rhythmic relationships between the parts if the first of each pulse group only is articulated and the other units left in space. The following graph is a transcription of this possible interpretation based on the arrangement of pulse groups numbered in the model. The structure emanates from the choice of factors as arranged in the matrix.
FIGURE 8.2

Possible Rhythmic Relationships When the First Pulse

of Each Group Only is Articulated.

Graph codes possible intersection when there are ten players each working from a different numerical factor.

> Resultant Density No. of Parts Cue 10 1,48 8 12

-	
5	13,37
5	17,33
1	43,41,31,19,7,9
3	5,21,29,45
2	43,11,15,16,22,23,27
	28,34,35,39,40,46,47

point of symmetry



The above represents a possible realisation since no information is contained in the score itself. As there are no notes accompanying the matrix, several questions arise. Instrumentation is unspecified. The octave displacement of the pitch sequence also is not defined so intervals given in the manuscript example could be inverted. For example, descending tones can become rising major 7ths. Tempo is not defined, nor are dynamics or articulation specified. The pathway or procedure needs comment. The matrix exists only as a preliminary model but one in which the important elements of the piece, pitch and pulse are specified. In order to perform the piece, a number of musical decisions need to be made. Jon Gibson outlines the answers to some of the unknowns which the model matrix poses. In a letter, September 1979² he sums up the relationship between freedom and control:

The tricky thing with a piece like <u>Multiples</u> is that there are so many variables, and I'd like to keep it open for a degree of experimentation with the given resources of each performing situation, but on the other hand, judgements must also finally be made as to what works and what does not work! The difference between freedom and license comes to mind.

In answer to specific questions he went on to specify:

Instrumentation : Technically for any number of instruments but works better with at least eight performers - orchestra size. The majority of instruments should be pitched although there is room for some non pitched instruments such as cymbal or snare drum played with discretion and many silences. Probably better to avoid homemade instruments with strange tunings, although this may work.

<u>Dynamics</u> : The piece should start at a moderate dynamic level with all performers but as the piece opens up the entire dynamic spectrum from ppp-fff can be explored. The performer should be sensitive to the ebbs and flows that will occur and respond to them one way or another in an interesting and effective way. ... should remain a natural and organic outgrowth of all the other musical elements also going on. This should be said about the piece in general. The overall effect of the piece should be textural and gradual - something like clouds continuously moving and changing.

²Personal correspondence with Jon Gibson. Letter dated September 1979. Directions for instrumentation, dynamics, tempo, pulse, continuity and length are extracts from this correspondence.

<u>Tempo Pulse</u>: The pulse corresponds to the tempo and is the common counting reference for all performers. The pulse can be played on a pitched instrument like a vibraphone (not a wind instrument) so that both melody and rhythm can be played. In other words the pitched pulse instruments can play the pulse as well as the pitches but instead of sustaining the pitch lengths, they are played as the pulse. e.g. GGGG AAAA

The pulse instrument(s) can even drop out of the pulse for bits of time or play the pulse at half time. The pulse can be traded among several instruments

(on cue) and usually conducted for a time without a discernable aural pulse at all. In fact I would be interested in a performance of <u>Multiples</u> which is conducted throughout. Other possible pulse instruments are piano, marimba, celeste, muted drum, cymbal.

He advocates a regular and conducted version as well as suggesting each performer keeps his/her separate pulse, or a common pulse that gradually changes speed.

<u>Continuity</u>: Each performer enters in upper left hand corner and works down column and across to the next at own rate also using silence. Once a section has been played the performer can always return to it and combine different sections in different ways and repeat them for a time before moving on.

Length : Thirty minutes to four hours depending on the situation. The performers do not have to get through the entire system before they end. There shouldn't be a feeling of urgency about getting through the material by a given time.

This further information clarifies a great deal. The need for further explanation exists because of the minimal nature of the matrix as a model. In a normal performance situation the composer can verbally explain ways of interpreting the model so that unknowns can be easily solved. This points to the reliance upon the composer for the information transmission. Certainly quite different results would be achieved if

the matrix model were the only criteria at hand for the piece. It also raises the issue of the intention of the score. For whom is it composed? In repetitive music, like much music of contemporary ensembles, some scores are intended by the composer as a catalyst for music making by specific performers. Publishing works as complete models is not so important with this musical genre. The copy of the matrix of Multiples is a photo of the original and as such should not be judged as a published item. In fact the composer at the time of writing was working from memory without a copy of the score itself. In Gibson's published works, such as 30's published by the Experimental Music Catalogue in both their Educational Anthology and Rhythmic Anthology, the model is a series of repetitive figures, accompanied by printed verbal instructions. The verbal description, a model in itself, when considered as pre-performance information, clarifies the way in which the notated or numerical model can be performed in time. The description outlines ways in which the model may be processed.

In <u>Multiples</u>, this information for processing alters the impact of musical characteristics shown to be contained in the model. If we look at freedom and control of every parameter as it appears in the model matrix and then as it is affected by the composer's remarks, a clearer understanding of the piece <u>Multiples</u> will become apparent before subjecting it to a variety of performance approaches.

TABLE 8.2

Combined Models and their Effect on Multiples

		Matrix	Composers Notes	Effect on the Piece
1. P	Pitch	Yes, DC [#] F [#] EB AG [#]	May be pulsed or sustained	Pitches are defined by model to 7, D C [#] F [#] E B A G [#]
2. S	equence	No information	The pathway matching columns retrograding and working with motives.	This elasticizes the pitch sequence allowing for retracking, repetition of a motive or part of a column, dovetailing in different directions.
3. н	armony	Possible incidence defined - unison spread unknown.	-	Dependent upon sequence
4. s	ilence	Not apparent.	Silence is part of reading.	This can interrupt any feeling of sequence or

TABLE 8.2 (continued)

				identity between the pitch sequence or feeling of groups of beats being an identifiable rhythmic set of counting units. The silence detracts from this being audible when it occurs within a frag- ment or in between a series. It is possible to drop out for a while completely but the per- former must count units so that each entry remains a sequence cont- ained in the matrix.
5. D	Dynamics	Unspecified	As in clouds not contrived - natural full mf-pp-fff	gradation rather than sharp contrast.
6. I m	Instru- mentation	It would seem that any pitched instru- ment would suffice that were in tune.	Mallet instruments being percussive pitched instru- ments which can easily pro- duce good attack over long	Bias towards a certain timbral combination pre- valent in much repetitive music especially Steve

TABLE 8.2 (continued)

	Given the sustained nature of the piece perhaps winds would not be suitable.	periods. Some percussion, piano.	Reich c/f. Music for Mallet Instruments, Voices and Organs.
7. Length	Depending on tempo and method of path- way - At = 60 it wouldtakel4' 30" once through the model without retracking.	Minimum 30 mins - 4 hours.	Build up of resonances & overtone layers by fre- quent reiteration of the same pieces forms a tap- estry or well. The build up of particular frequen- cies over a long period adds a psycho acoustic dimension not present in shorter pieces.
8. Tempo- Pulse	Unspecified	May be experimented with as a whole: uniform, individual constant or changing.	Could be elastic.
9. Texture/ Orchest- ration	Unspecified	Group sensitivity and improvisation.	Ins/outs by performer taking responsibility for the piece as a whole.

In this table it is possible to see some of the actual musical implications of the model to the realisation of the piece. The composer needs more than the matrix model to convey his intentions and the performer's working processes are not overtly defined. However, from Gibson's notes it is clear that the details of the matrix would have been composed with these performer processes in mind. The relationship between model and process is fundamental to the potential sounding qualities of the piece. Statements can only be fruitful in terms of a given performance. One performance is one solution to the dynamic interplay. Several performances could yield varied solutions. In order to try to capture the identity of the piece several realisations of the one work seemed to offer the best methodology. As different performers would allow experimentation with too many variables, an ensemble of post-graduate students all from the same composition school was chosen to perform ten different realisations of the work.

The Experiment

AIMS

- To study models and processes at work in the performance of Jon Gibson's Multiples.
- 2. To have a continuous first hand working relationship with a chosen piece of repetitive music over a period of time.
- 3. To collect a body of original data in the way of performance tapes which could provide a

comprehensive and detailed perspective from which to view models and processes at work.

- 4. To arrive at one or two artistic solutions to the piece which worked in the context of the chosen ensemble.
- 5. To come to a greater understanding of the possibilities and identity features of the work.

METHOD

The Latrobe University Recording Studio, Sound Laboratory #2 was booked for four evenings, the 26th, 27th of November and the 3rd and 4th of December from 7.00 - 10.00p.m. An ensemble of ten people including two smaller groups L.I.G and Music 4 volunteered to work on the piece. All had completed a course in musical composition at Latrobe University Music Department and were mainly Honours and Post Graduate students, all composer/performers in their own right. It was decided for each occasion that the ensemble should remain the same in terms of numbers and instrumentation if possible to allow for greater focus on model and process relationships.

THE ENSEMBLE

1.	David Chesworth	Xylophone	
2.	John Crawford	Marimba II, upper register,	
		Celeste (5, 6)	
3.	Gavan McCarthy	Marimba I, lower register	
4.	Rainee Linz	Fender Rhodes Electric	
		Piano	

5.	Julie Doyle	Regale (1) Glockenspiel (2-	
		10)	
6.	Carolyn Robb	Vibraphone	
7.	Mark Pollard	Cymbal, Triangle, Chimes,	
		Block	
8.	Richard Vella	Piano	
9.	John Campbell	Electric bass guitar	
10.	Ros Bandt	Celeste, conductor (5,6)	

The four evenings of studio time were selected to avoid ambient noise in the studio. All members received the score and a sheet of accompanying notes gleaned from the composer's letter.³ Practice and memorization of the material beforehand were encouraged to allow for greater concentration on the processes of individual playing and group interaction. Few had really prepared, so much of the first night was devoted to acclimatizing the new ensemble who had never played together before and becoming familiar with the total sound.

It was my intention very early in the study to extract feedback and to organize the performances in a way which would not impede the natural unconditioned approach of the ensemble to the music. It was clear that with several re-workings of the piece, something of the initial energy and naive magic could easily be lost. For this reason the more prescriptive realisations were left until later. The versions

3See Appendix C.

proceeded in this order, all takes being recorded on an Otari eight track taperecorder, recorded with Sennheiser directional mikes and an omnidirectional stereo pair.

Night One, Version One⁴ - Straight Raw Approach.

Instructions - minimal clarification of continuity - insistence on accurate playing and adherence to the pulse.

Instrumentation - organ, bell and cymbal. The organ dominated to such an extent that by group request it was exchanged for a glockenspiel. The group could not conceive of the piece as an organ concerto so from the outset the group decisions were important in determining what worked and what did not.

Tempo - for the first run through the tempo was rather slow but in the second run, a much quicker one provided a good challenge at this stage.

<u>Night One, Version Two</u> - changes, no organ, faster tempo.

After this take, I circulated prepared sheets⁵ designed to extract performer responses and attitudes. It also provided the opportunity to make everyone's response available for discussion and thought. As a means of tracing continuity procedures accurately, each performer was asked to recall their individual pathway on the score by a series of lines. Other questions for the first time introduced performance/practice problems

> 4See Appendix B, Tape example 1, excerpt. ⁵See Appendix D.

overtly asking specific matters relating to timbre, silence, pulse, overall texture, range, tempo, dynamics and ensemble relationships and an opportunity for criticism. Most people read each other's responses and at the beginning of the second session, night two, a general discussion revealed the following ideas which could also be seen as a summary of the filled sheets. The ensemble idea of the piece was evolving.

There should be more space, more sustaining, less pulse, differentiating of accent particularly on the low numbers to bring out the identity of the theme. Ideas should be perpetrated for longer times and there should be more passing of motives between players. More eye contact would help the interaction. Inverted Pedals and imitation were desirable, but dynamics should be more uniform than individual, particularly in persisting with soft passages without ending. Registration and density should be carefully regulated by the group listening to the total sound.

Night Two, Version Three⁶

Another 'straight' version was requested in order to apply the fruits of the discussion. After intense practice the night before and during the day, and with particular musical details in everyone's minds, the score was performed again and version three was recorded.

Night Two, Version Four

This version was concerned with the division or multiplication of the pulse into units of any size, so that although a basic pulse was cued in, the unit of counting could be in any equal proportion of the pulse. Initially, this may not appear to sound any different

⁶See Appendix B Tape example no 2, complete performance.

due to the implementation of various silences incorporated into the uniform counting unit, e.g.

In fact, the counting unit is augmented or diminished according to the size of the pulse unit chosen by the performer. This makes the formal canonic element become rather more elaborate as the pitch sequences proceed at different rates. So while all the divisions of the beat may be freely chosen, they do relate to an ongoing constant pulse. It was decided that the performers could change their counting unit at any time as long as it related to the pulse in some simple proportion.

Night Two, Version Five

This involved the preparation for the first conducted version. Version five was concerned with monitoring one line of counterpoint exactly by trading the pulse from electric bass to piano, electric piano, marimba, glockenspiel, celeste and cymbal. Instructions to the pulse instruments were to play the pitch sequence for exactly the number of pulses specified until relieved of their responsibility at the next entry. The conductor decided the arrangement of the bass from the bottom pitch range upwards to the cymbal. (See conductor's score.) The cues were conducted at the beginning of each group of 48 beats with each solo group being given a heavy downbeat. The conductor found it a help to rewrite a conductor's part

included here as it could be considered a model superimposed on the score.

FIGURE 8.3

Model/Performance Part

Conductor's Score for Version Five Multiples

Traded Pulse Beats

1	2	3	4	5	6	7
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
6	6	6	6	6	6	6
8	8	8	8	8	8	8
12	12	12	12	12	12	12
16	16	16	16	16	16	16
24	24	24	24	24	24	24
48	48	48	48	48	48	48
bass	piano	elec piano	marimba	glock	celeste	cymbal

Instructions to Pulses -

Straight sequence until they have finished their responsibilites. On one set of entries the model will be completed and they may then pursue a free exploration of the score. Pulses could be applied creatively and other instruments could become pulses. Many dynamic bursts were performed as a result of this. After a time every one related to the pulse, hovered, and finished with the conductor. A warm up had all pulse instruments playing their part simultaneously.

All other instruments not engaged in the contrived canonic entry could remain freely exploring the score however they wished, coming in and out as their predilection for silence, sustained tone or pulse dictated. Once the cymbal had finished the model once, (48 final column) all players could choose whichever role they wanted. The continuing conducting gave greater opportunity for controlled silence as the pulse was always present, if not audibly. Some great dynamic bursts were conducted only when the ensemble precipitated them. A return to the pulse was verbally agreed upon and the end was to be conducted - that is the decision of one person not the group.

At the end of Night Two, the cued traded pulses were practiced in preparation for the entire take which happened on Night Three.

Night Three Version Six7

The second of the conducted versions concerned pitch range, tempo change and dynamics. This version was contrived to effect changes in a particular way. The overall dramatic form was the point of the experiment. A graphic chart was used as an end or secondary model to convey the flow of the piece from medium tempo medium register with crescendo bursts leading to a slow sparse high section which gradually gathered momentum and pushed towards a fast <u>fff</u> end.

⁷Appendix B, Tape example 3.

FIGURE 8.4

Secondary Graphic Model Version 6.



This secondary form could be seen to work against the composer's wishes for organic growth but I thought such an experiment was nonetheless valid to bring out different strengths in the ensemble playing, particularly in respect to dramatic intensity. If they could be sure there was a common aim there was reason to play out and it was my intention to provide an opportunity for more extroverted playing.

Night Four, Version Seven

This was aimed at varying individual tempi. This would bring about an eradication of the basic pulses. Obviously the listening problems were immense in trying to preserve individuality so ear plugs in

some cases were used. The beat was divided very unequally with players aiming to preserve their own status rather than integrating or co-operating. This was done twice as a desperate attempt to preserve individuality. The visual element also worked against independence.

Night Four, Eighth Version8

The eighth version worked on the same premise but performers laid up their tracks individually in the studio. Tracks 1-3 December and 4-7 in March. There were seven players in this, no percussion and one marimba. The eighth version (B) was a studio mix by the technician and recording engineer, Brian Parish, of the above seven tracks. He chose to use flanging, compression, gating groups of instruments into reverberation and generally setting different blends and textural changes according to his own taste. From the same model, the piece became a studio piece by performer technician, thus showing another potential processing agent in the life of Multiples. On this fourth night, a second feedback sheet was circulated⁹ on which all the performers were asked to track pathways for version seven and to comment on their individual relationship in processing models in all the versions.

> ⁸Appendix B, Tape example 4a and 4b. ⁹See Appendix D.

Version Nine¹⁰

This was the final normal free version with no instructions. It must be said that it was definitely the last late-night take.

Daytime Concert Version Ten¹¹

This was half a concert of Repetitive Music performed by L.I.G. and Music 4 at Latrobe University. It was the first in a series of weekly music department concerts on March 13, 1980. There were no stipulations other than to give it everything and to try to play for at least one half hour. This ensemble never made the thirty minutes minimum time the composer suggests. Obviously the variables of a concert situation, even though in the same venue (recording studio Latrobe) make the social dynamics of group improvisation within norms a rather different event.

¹⁰See Appendix B, Tape example 5, complete performance.

¹¹See Appendix B, Tape example 6, complete performance.

The Chart, Comparisons and Contrasts of Realisations

The various performance experiments can be compared according to a vast array of criteria, specific and non-specific. Aspects such as the length of the piece, the tempi, instrumentation, silence, pitch series can be accurately defined. Form, density, amount of motivic development, dynamics, texture, are much less easily summed up. The information has been collated in graphs, tape and description so that appropriate and diverse means of communication can be interpreted for each musical problem.

Of the realisations, 3, 9 and 10 are similar in that they all allow the players to freely interpret the piece during performance time with no preconceptions as to moulding any musical elements. These takes most closely conform to the relationship between model and process described in the composer's letter. (See pages 9-11.) It is a very fluid flow situation in which singular and group energies can be picked up or allowed to subside at any moment. The performer interaction is at its highest peak here as the continually listening performer chooses the most suitable register, dynamic, part of theme to suit his notion of the existing musical fabric. The decisions whether to support, mutate, deviate, change or not play are ever present to a degree which can radically effect the musical content. The extent of repetition is vulnerable at any given moment. In the following graphs this elasticity can be noticed as the musical fabric is dependent on

the choices made in each performance.

In other realisations, where guidelines are predetermined, the performer's choices do not have quite so much power in building or interrupting the general continuity at a moment's notice. This is particularly so in realisation 5 and 6 where the guidelines are conducted and organised by one person.

In other realisations 4, 5, 6 and 7 the knowledge of the superimposed model, in each case became a moderating factor to which the free creative exploration of the piece was subjected. A certain psychological preoccupation with a new technique such as working towards prepared climaxes, playing in your own tempo, thinking in various proportions in dividing the pulse, or waiting for a specific one, drastically effects the way all the musical information may be processed. It may become a type of funnel or lens through which all the other musical characteristics pass. This would vary from performance to performance of course, according to the degree of difficulty, familiarity, and musical experience and may or may not be a constant state for a given interpretation. For instance in realisation 5, the melody theme is treated strictly between players as a cantus firmus on one continuum for the first time only, once through, so that it would be possible for instruments not having the pulse at all to be unaffected. The pulse instruments once having completed their part could relax entirely.

In the sixth realisation players had to rely not on themselves but on the conductor throughout to co-ordinate three elements, tempo, dynamics and registration. Realisations 7 and 8 stressed the individual rather than the group so that performers had to adjust to individual listening centres. Processing features which directly influenced texture, form and dynamics were how well a performer could preserve a tempo or how he related to a solo performance. (realisation 8) Chance in no.8 played a huge part in textural density, and the degree of counterpoint, while in 8b those chance results were totally manipulated by the engineers concept of continuity, variation and change.

There is no doubt that the excitement of having an audience in a live performance situation helped the ensemble to feel a unit in the tenth performance and the energy level and concentration was high throughout for all players. In this new context, the ensemble was able to bear the fruit of working through all of the other working situations. Each player by realisation 10 had an intimate knowledge of his instrument, the model and knew many possible outcomes. The players were much more prepared, rehearsed and perhaps conditioned by their experiences, than in any other performances. This could result in a narrowing of expectations on the part of the performers but also a freedom within the known restriction. Jon Gibson's term 'licence' here becomes operative as the

performance processing in this final interpretation is an example of an integrated ensemble working towards a similar goal but through elastic and complementary pathways. The decision-making to be done by all performers was confident especially as certain problems had been worked through and eliminated during the course of the sessions. These were dominating instruments, always building up too quickly, fear of silence, lack of energy, or too much unison pulse. In other words, by the concert, this particular ensemble had evolved its own notion of the piece or its own stylistic attitude towards the musical material. This could be completely different with another ensemble and is in no way meant to be interpreted as definitive. It merely represents this ensemble's idea of what works and what does not work which is the end result of the experience of working the material through time - the processing.

A comparison of flow charts of realisations 3, 9 and 10 which are similar interpretations will reveal several features which I think articulate this ensemble's attitude to style in <u>Multiples</u>. The model or pre-performance information in terms of score and instructions was the same with no moderating factors to condition the creative processing of material, other than a greater knowledge of the piece gained over the working time.

FIGURE 8.5

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Post Performance Scores of Realisations 3,9 and 10



Beginnings and ends were free in 3 and 9 although it was decided by the ensemble beforehand that the xylophone should begin and other instruments follow at will. Three and nine are in the studio and not in front of an audience.

In each of three versions the overall dynamic waves show rises and falls according to the vertical axis. Within the dynamic area certain textures have been delineated by way of generalisation particularly considering the amount of reduction in space time, each square representing one minute. Realisation no.3 is typical of many of the other versions with its heavy pounding thematic opening. There are 4 peaks in each realisation which appears to be related to the number of repeated forms implied in the number series (see first graph). In each, there is at least one peak half way through where the pull of the pulse seems to pervade the entire ensemble. In all the interpretations, there are canonic thematic entries, motivic interplay and development, areas of extreme registration and inverted pedal pulses in high metal. The xylophone and vibes in part have motivic functions while the bass guitar and bass marimba provide excellent sustained humming drones which add a great deal to the stability of the parts and also to the acoustic 'aura' and feeling of the music. Interpretations 9 and 10 show a more prolonged use of sparse textures and no. 10 has a greater emphasis of slow motivic development, 7-14 minutes. A11

interpretations have sharp falling away textures straight after tutti climaxes. The greatest use of silence and soft passages is in no.9. All have examples of extremely complex counterpoint, insistent pulses and delicacy. With all of these similarities it is possible to postulate a family resemblence but by far the most audible similarities are those derived from the pitch rhythmic sequence. The same model has yielded similar responses but it is obvious by looking at the listening graphs for each of these three pieces, that each has a life force of its own. The third being short seems a compact display of diverse textures, while the ninth is a succession of highs and lows that work in a very dramatic way of opposing highs with quickly disintegrating lows. The last is an expansive more through composed essay in developing the material around two fairly symmetrical highs over a much longer time span. The performance processing in each case has yielded different musical forms, containing different ebbs and flows but retaining the essential cloud formation. Repetition and variation are the basic tools.

Of the other interpretations, numbers 7 and 8 represent quite different pieces. The result in each case is that there is little vertical co-ordination, no unison themes or motivic interlacing because there is no social interaction. One becomes much more aware of the space against which the model 'hangs' in a totally unpredictable way especially in take 7 where

the anxious feat of surviving with your own tempo is brought to bear in the mood of the music. There is little to grasp as the ensemble persists in a desperate way. An alteration of the idea of a mono-tempo to multi-tempi completely changes the texture and ability to generalise about continuity and change. In number 4 also there seemed less insistence on the pulse and more inbuilt silences, so that many vertical textures were colliding aggregrate and molecular groupings of different sizes according to the proportion of the different divisions of the beat. The theme moving at different speeds brought new implications for total formal line up between the parts. Number 6 is a contrived romantic version with the conductor driving an idea throughout the ensemble. This common direction brought about an insistence which brings a much denser field of sound, more intricate counterpoint, driving pulses and articulated attack. As integration was the prime concern it is easy to see why the total ensemble works on the same downward fourth motive and there is no real silence. The tempo does move but not vertically and fairly well reflects the graph of the superimposed model. (Figure 8.4.)

Conclusions from Case Study

A model is rarely a finite thing. As a preperformance recipe it can indicate specific criteria, in this case pitch and pulse grouping, or it can leave things unspecified.

The Model in the matrix implies and

necessitates the process of sequencing through the numerical pathway. However, several other models and processes are operating as part of the general performance practice field.

<u>Models</u> such as player's background - technique, style appreciation, skill at improvisation, ability to spark with the group on the night, performance energy are everpresent and superimposed over the matrix.

<u>Processes</u> involve the total feeding in and out of a large volume of information, sorting it and making a statement of sensitivity at the same time as nine other people. Musical characteristics are at the mercy of this individual and collective processing. Dynamics, amount silence, amount of motivic development, timbral changes, register transposition, and the general supportive or extroverted role divisions are all effected by real time processing.

Nine performers' conditioning filters are operational. Their processing abilities are inextricably linked to their metal state, their motor control, their performance experience and their attitudes towards predictability, expectation and change. Most of all they have had to expand their perceptions in time as performer, perceiver, listener and creator.

Models and Processes affect choices made to deliver the musical criteria. Repetition in the work achieves status or can be ignored. Repetition is a victim of models and processes.

In this work it can be seen that the relationship of model and process by composer and performer moulds the piece. Repetition and the extent of repetitiveness in the work relies heavily on the choices made in realisation despite the simple repetitive systems set up by the composer. The takes which incline Multiples towards a more rugged and athletic repetitive work are those in which players have opted for prolonged use of reiterated pulses. They tend to take over other musical features as the pulsing accents are so audibly prominent, existing in the listening foreground. Other versions like number 6, tend to move the structural form away from small unit repetition into broader contrasting sections more in the romantic tradition. The best versions are those in line with the composer's wishes being more subtle 'through' realisations where changes appear slowly by mutation from within and the piece's 'clouds' are internally self propelled from the relationships of the players. In these versions repetitive techniques of pattern, pulse, vertical alignment, imitation are the performers tools to craft a continuous collective music fabricated by repetition and slow change.

CHAPTER 9

DEGREES OF REPETITION:

THE SECOND DECADE, A MOVE TOWARDS COMPLEXITY?

The study of a musical composition as a whole such as Gibson's Multiples enables the relationship of parts to be considered in relation to each other. Analytically, the number and type of musical processes at work can easily be detailed, but the holistic stylistic approach to proportion, priority and interrelationships require synthetic interpretation far beyond the skills of note counting. This chapter aims to give credence to selected significant examples of the repetitive music repertoire of the second decade 1970--80. In these isolated compositions, the interaction of the different processes, in particular repetitive techniques and the extent of their use will be examined. This study is unlike the earlier chapters 3-7 in which specific musical processes were identified in different contexts in a range of musical compositions. Here the extent of repetition can be noted within one work through a formal, structural or parametric analysis. Continuity, repetition, unity and variety, and rates of change are the underlying viewfinders in an attempt to find the style features

and so the identity of works chosen. As well as a detailed study of pertinent examples, the hypothesis that the second decade represents a move away from monodirectionality and towards simultaneity and complexity will be considered from the two perspectives: 1. single major composers, and 2. historically, in preparation for the conclusive overview in Chapter 10.

In Chapters 3-7 many pieces of repetitive music have been studied in the light of one type of musical process which they contain and which is an important and essential ingredient. Drones, pulses, cycles, contrapuntal imitation, elongation, additive and subtractive processes, variation form have been identified as techniques which can and do involve repetition. They are methods used in the purpose of continuity and repetition. They result in stasis and prolongation rather than change to varying degrees in different works. It would be naive to view all these works as repetitive solely from the point of view discussed. In many instances several repetitive processes are at work simultaneously and would just as easily fit in one chapter as another - hence the cross referencing at the beginning of Chapters 5 and 6. Yet there are examples in the first decade where one parameter is pursued obsessively and the single minded mono-directionality is discussed at length throughout Chapters 3 and 4.

The selection of works of repetitive music in

Chapters 3-7 has made no attempt to be encyclopaedic or representative of the repertoire as a whole. It has rather aimed at showing the great range and application of repetitive techniques applied in music since 1960 in America and elsewhere. By far the greater number are American.¹ Nor can the names of La Monte Young, Terry Riley, Steve Reich and Phil Glass escape status as the major four exponents of repetitive music, having devoted 20 years of their lives to a preoccupation with repetition in music in their respective ways. Over such a period of time, 23 years since 1960, repetitive music has been built through the consolidation of techniques, the growing experience with musical processes and the maturity of vision which comes with a concerted artistic output. Individual styles are forged and tastes may change. Later in the chapter a study of three works from the second decade and beyond, Reich's Tehillim '81, Glass's Einstein on the Beach, '76 and La Monte Young's The Well-Tuned Piano '76 will reveal each composer's individual handling of repetitive techniques in their mature style. Terry Riley will not be discussed due to a thorough investigation of his individual approach in Chapter 7.

It is really no accident that works in the second decade by Steve Reich and Phil Glass bear titles relating to size and number. The growing preoccupation with something greater than a basic unit is shown in

¹See Appendix A.

the titles <u>Music with Changing Parts</u>, <u>Music in 12 Parts</u> by Glass and Reich's <u>Music for 18 Musicians</u>, <u>Music for</u> <u>a Large Ensemble</u> and <u>Variations for Winds</u>, <u>Strings and</u> <u>Keyboards</u> 1979. Musical implications from these titles are the assembly of multiple parts, large groups of sound sources, and an interest in change and variation. These are all features pointing to an interest in complexity.²

Study of the music itself verifies these implications. A preoccupation with sections and the assembly of parts both in formal design and internal vertical structure are to be found in all the above mentioned works. By 1973 Reich was already using three different repetitive processes simultaneously in Music For Mallet Instruments, Voices and Organs, phasing, augmentation and the substitution of beats for rests or rests for beats. Reich's interest in linear and vertical layering became coupled with well-defined sonority and the use of the voice as an instrument. Glass's intention to expand was rather more obvious, pushing Music in 12 Parts over a four hour time period and working with cyclic mathematics to establish broader time spans containing the smaller additive and subtractive rhythmic units. All the sections of Music

²By 1976 critics and journalists were already using the term 'maximalist'. Daniel Caux first used the term 'maximale' in Art Press International writing on Reich's <u>Music for 18 Musicians</u> in the Paris Autumn Festival '76. John Rockwell of the New York Times and Roger Heaton have both used the term 'maximalist' in relation to Glass's <u>Einstein on the Beach</u>, quoted in <u>Contact</u> 24, 1982, p.38. This could be seen as reaction against the term minimalism, see Introduction.

<u>in Twelve Parts</u> are harmonically related and carefully partitioned as beginnings and ends. The eleventh part treats the idea of the 'harmonic plateau' as the main focus of processing, pushing the musical material through a series of modulations, an aspect never before utilised in Glass's work.³ The simultaneous handling of the linear additive and subtractive processing, recurring cycles, and harmonic development organized in particular contrasting sections is a far cry from <u>1+1</u> of 1968.⁴

While it would be fascinating at this point to stop and compare the development of Reich and Glass's attitudes to repetition in all the works of the 1970's, it must suffice to say that each composer explored vistas which are best seen in the light of music of their individual musical outputs.⁵ In the three works chosen, Reich's <u>Tehillim</u>, Glass's <u>Einstein on the Beach</u> and Young's <u>The Well Tuned Piano</u> the emphasis will be on the individuality of style in relation to the composer's own previous compositions rather than comparison between composers. By looking at specific works on an individual basis the important musical features will present themselves.

³See 'Phil Glass' in Walter Zimmerman's <u>Desert</u> <u>Plants</u>, (Canada 1976), p.114.

⁴See Chapter 4.

⁵A full discussion of this is beyond the scope of this thesis but a comparison of these two composers as agents of innovation in repetitive music would be a worthy in-depth study.

Steve Reich, Tehillim

Although Steve Reich's <u>Tehillim</u> of 1981 technically lies in the 1980's and for purposes of definitions of this chapter the second decade is intended to mean 1970-1980, this work has been chosen for specific reasons. It is a work which takes new directions hitherto unexplored by Reich, while at the same time reaping the benefits of many seeds sown in several different works throughout the seventies. It is an individual synthesis of ancient and modern, symphonic and chamber styles, simple and complex. In the analysis which follows, Reich's mature style can be seen at work.

Steve Reich's <u>Tehillim</u> in four parts was commissioned by South German Radio, Stuttgart, West German Radio, Cologne and Rothko Chapel, Houston. It was completed in August 1981. It is scored for 2 oboes, 3 flutes, piccolo, english horn, 4 clarinets, bassoon, 6 percussion players required for maracas and clapping, up to 4 tambourines, marimba, crotals, 2 electronic organs and 4 women's voices, 2 lyric sopranos, 1 alto, 1 high soprano and strings with a solo section. Amplification is required for most of the wind and voices as well as strings.

<u>Tehillim</u> is a work in four parts based on the cantillation of Hebraic psalms which Reich studied intensively during the mid seventies, 1976-7. It represents a return for Reich to his basic cultural origins, being Jewish although he had never studied or

observed traditional religious practices. The use of the voice to sing sacred texts is revolutionary for Reich who had developed an interest in the use of vocal sung tone as instrumental timbre through many different works, since <u>Drumming</u> in 1971, <u>Music for Mallet</u> <u>Instruments, Voices and Organ</u>, 1973, <u>Music for 18</u> <u>Musicians</u>, 1976, <u>Music for a Large Ensemble</u>, 1978. In <u>Tehillim</u> sung texts are important building bricks for each movement both as a whole and internally. The music is essentially derived from the psalm texts as each text has its set melodic theme built on the speech rhythms contained in the words. The work is really a Symphony of Psalms.

<u>Tehillim's</u> formal and structural outline is simple and direct. The presentation of Reich's scores is both clear and practical. The musical material is clearly stated. There are no hidden secrets in keeping with his performer-centred approach. As Reich has chosen to compose for larger groups of players outside his own ensemble, conducting and performing cues have become even more explicit. The alphabetical cues for structure along with the Roman numerals for the concurrent thematic numbering are Reich's own. The following table outlines the sequential and linear formal aspects with respect to Reich's handling of themes.

TABLE 9.1

Structural Form of Tehillim

.

Part I	Part II	Part III	Part IV
A- I II III IV B I II III IV C I II III IV D I II III IV IVa E- I II III IV IVa F I 4pt.c.p.x6. G H I J K II 4pt.c.p.x6 L M N O P III 4pt.c.p.x6 Q R S T U V IV 4pt.c.p. W X Y Z AA BB I II III IV DD EE I II III IV IVa CODA	A I II III B I II III III C I II III III D I II III III E I II III III G I II III III H I II III III H I II III I	A I II B I II C I II D I Ia II II E I II F I Ia II II Inst. Coda accelerando	A I II III III B I II III III C I c.p. D E F G II c.p. H I J III c.p. K L M O I Ia II IIa,III IIIa P no melody. R I Ia II IIa III IIIa S Hallelujahs III. T Coda Augmentation at O Free development S
Sonata Form	Variation Form	Variation Form	Sonata-Allegro Finale.

A-Z = Score Cues

I-II = Numbers of Themes
Ex.9.1, Major Themes in Tehillim



Form and Structure

Overt symmetry is revealed in the table with parts I and IV having a greater number of parts and spending units of time developing single themes. In contrast parts II and III treat smaller numbers of themes in a restricted manner. The four parts in number, type and sequence bear a remarkable similarity to traditional four movement form and <u>Tehillim</u> can be considered a modern Symphony of Psalms just as easily as the Stravinsky work of 1932.

The first movement or part is in Sonata Form with an exposition in which 4 themes are stated in order 5 times, A-E. The entry of the maracas' pulse at F states the beginning of the development which treats each single theme in 4 part counterpoint six times, a simple idea rigorously applied F-J theme 1, K-O theme II, P-V theme III, and V-Z theme IV. The single shift of key signature from one flat to one sharp in P-Z gives an added developmental feel which prepares the way for a return 'modulation' at the recapitulation AA where the key signature of one flat is re-employed. The recapitulation is not as straightforward as after the initial restatement of themes in BB, the 3 following statements of themes III and IV in cues CC DD and EE appear in a different tonal centre with two sharps.

The second movement has three 2 voice themes stated in order eight times in a symmetrical grouping rather like a rondoesque variation form common to

psalmody. This is caused by the instrumental sections C and F being placed symmetrically between three pairs of cues AB, DE, and GH.

<u>The third movement</u> is an even more restricted variation procedure and like the second treats a smaller number of themes in order 8 times. There are internal repeats in sections D, F and G and the movement has an instrumental coda.

<u>The fourth movement</u> mirrors the first in many respects. It uses large instrumental forces, has more themes and engages a wide selection of developmental techniques including a contrapuntal treatment of each separate theme in turn C-G, G-J-J-H. It resembles the sonata-allegro finale with its complex number of elements and treatments, its tonal ambiguity and the exultant Hallelujah end.

Thematic Approach

Reich's approach to the psalms as themes is rigorous. Each text has a set theme which never changes. The thematic assembly is immediately discernable from the text, whether restated or changed. It is as clear as the cueing which accompanies it. Each movement treats themes in order and each movement is built on the musical elements composed into the themes. A closer look at the nature of the themes of each part is useful in encountering Reich's basic musical preoccupation in each movement.

TABLE 9.2

Theme and Text Relationships in Tehillim

	Themes	<u>Text</u>
1	l - 2 single voice 3 4 -	Psalm 19. 2-5. 4 verses Day unto day uttereth speech, and night unto night showeth knowledge. There is no speech or language where their voice is not heard. Their line is gone out through all the earth, and their words to the end of the world. In them hath he set a tabernacle for the sun, which is as a bridegroom coming out of his chamber and rejoiceth as a strong man to run a race.
2	1 - 2 2 part 3 -	Psalm 34. 13-15. 3 verses Keep thy tongue from evil and thy lips from speaking guile. Depart from evil and do good, seek peace and pursue it. The eyes of the Lord are upon the right- eous, and his ears are open unto their cry.
3	l - antiphonal 2 -	Psalm 18. 26-27. 2 verses With the pure thou wilt shew thyself pure and with the froward thou wilt shew thyself froward. For thou wilt save the afflicted people; but wilt bring down high looks.
4	1 - 2 2 part 3 3 -	Psalm 150. 4-6. 3 verses Praise him with the timbrel and dance, praise him with stringed instruments and organs. Praise him upon high sounding cymbals. Let everthing that hath breath praise the Lord. Praise ye the Lord.

Psalms as Themes

From the above breakdown it can be seen that the theme-text relationship directly corresponds to the number of verses chosen for the psalms. The first part has 4 themes and 4 verses, the second 3 themes 3 verses, the third two verses 2 themes, and the fourth 3 themes three verses. The extra-musical meaning of the texts can also be seen to be influential.

The first part based on Psalm 19 is concerned with the spreading of the word through all the earth. The preoccupation with voices is manifest from the outset, speech, language, voice, words, being important words of the psalm. All the themes in <u>Tehillim</u> are first stated by voices. The linear spreading is a musical metaphor for Reich who in part 1 wields the thematic material in a contrapuntal elongation of the separate themes.

The second chosen psalm, number 34, concerns the content of the spoken word and the attempts to keep it pure. Traditional good/evil, peace themes are described. Reich chooses an archaic vocal technique from the early church, organum to set this text with vertical relationships of musical compliance being prominent: unison, doubling, parallel organum and simple 2 part counterpoint. The sense of vertical homophony and the departure from it into counterpoint could also be said to mirror the text's intention.

The third psalm, number 18, is short and describes the influence of social context, pure or

froward. This musical setting treats small similar themes in a variety of orchestral arrangements so that changing timbral context is the main subject of the music. The antiphonal setting of the text itself derives directly from practices of antiphonal psalmody.

The fourth psalm, number 150, has definite internal repetition and links because of the recurrent use of the word 'praise'. The text itself calls for the augmentation of musical resources, strings, organs, high cymbals and everything that hath breath. All these should be used together to praise the Lord. The tutti-finale aspect of the fourth movement cannot be overlooked in the light of this remark nor can the faster tempo, \downarrow =144,or the 3/8 metre with its dance like rhythms. It is also noteworthy that the text is the final 150th of the book of psalms.

Melody, Intervals, Rhythm, Metre.

A study of the themes given above reveals the following unifying musical features in the setting of the texts. The intervals of a fifth and fourth are common to almost every theme. In part one, each of the four themes has at least one descending fifth, theme III having four. Themes in part III are built solely on the descending fourth and rising fifth.

Parts II and IV have greater use of the interval of a sixth melodically and vertically due to the use of organum in parallel sixths and thirds. The interval of a seventh is also found in these two sections, part II in theme II and III, and part IV in

theme II. There is much movement by step and generally the use of perfect intervals prevails. It seems fitting that the piece should move towards extended use of the rising fifth for the hallelujah finale after the more frequent use of descending fifths in parts I and II.

The melodic range of Parts I and IV are similar, both being from with one flat giving a Dorian feel while the internal Parts II and III are in contrasting centres. Part II has two themes in 4 flats and the third in 5 sharps. The interest in vertical arrangement in Part II is obvious from the start with the first two themes being given out in parallel sixths. The third is in 2 part counterpoint. This is extremely noticeable after the homophonic movement of themes one and two and the single voicing of all themes in part one. Part III's 2 antiphonal themes stand alone in their austerity. The spatial arrangement of line against line, their brevity and common key signature put the emphasis on dialogue and role rather than melodic contour or interval type. The themes all seem to have subsections being in fact melodic units which string together smaller units. Reich has documented this technique as being derived from the cantillation of Hebrew Scriptures and has used it in Music for a Large Ensemble and Octet.⁶ Tehillim more than any other work, uses melodic contour as an

⁶See Steve Reich, Notes to <u>Octet</u>, <u>Music for a</u> <u>Large Ensemble</u>, <u>Violin Phase</u> on ECM 1-1168, 1980.

important structural device.

Orchestration/Timbre

It is in the third part of <u>Tehillim</u> that Reich's concern for sonority, and his deft handling of orchestral resources can best be seen. The following table outlines the orchestral setting of thematic material so that the carefully chosen number of changes can be immediately seen with respect to the number of voices, the role, and the orchestral blending. (See Table 9.3.)

It can be seen in this table that voices and strings have assigned static and moving parts according to context. The strings become more and more liberated from their traditionally static, almost banded drone function, to becoming part of the total counterpoint. Once they establish a contrapuntal imitative style within themselves, exploiting idiomatic string features such as register, articulation, arco, pizzicato, glissando, they move towards solo material. The solo strings also pair up towards the end of the movement, in doubling in new combinations with solo voice. The clarinet, high string and single voice melody is a timbre Reich has not used until this point, preferring to keep a very static and set role for the voices. They are always doubled by clarinet, oboe, english horn or bassoon. The pairing of voice and wind instrument is a well used technique of Reich's which he has favoured since Music for 18 Musicians.

TABLE 9.3

Orchestration in Part Three of Tehillim

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CUE	THEME	PAGE	VOCAL STYLE	INSTRUMENTATION	PULSE
A	I	166	2 Voices share	Clarinet and oboe double	Marimba and
	II	167	theme antiphonally.	voices.	vibe.
в	I	168			Vibe and mar-
	II	169			imba pairs. Pulse rhythms.
C	I	170	4 Voices in 2 homo-	4 winds double voices.	
	Ia	171	phonic pairs, set in an Antiphonal relationship.	Strings enter as vocal aftermath. They move from high to low.	
	II	174	-	Strings rest 4 bars, Enter	
	IIa	176		and then rest again.	
D	I	178		Strings hocket with accents	,
				space and stoccato.	
	Ia	180		Strings group in 2 voice	
	II	182		pairs imitating the vocal	
				strands.	
	IIa	183		Arco, pizz, sfz, and divided strings.	
	IIb	184	2 Voices.	Instrumental fade and thinning.	
Ε	I	187	4 Voices in 2 pairs	Strings 4 bars rest. Enter	
	Ia	188	in antiphony.	from high to low in imitat-	
				ive pairs. Very high register.	
	II	190		Entries, rest in strings.	
	IIa	191			
F	I	193		Strings divide into 5 bands	
	Ia	195		and 4 pairs. Strings rest.	
	II	196		Unison strings, then divided	1.
	IIa	198		Strings enter from top down.	
G	I	200		Pizz. and arco.	
	Ia	202		Entries and rests.	
	II	204			
	IIa	206		Strings not divided. String solo.	3
	IIb	207	2 Voices, anti- phony.	2nd Violin solo. Cello pulses.	Cello pizz. and arco.
	IIC	209	Voices fade.		Vibes fade.
	III	210		Sustained strings and wind, unison.	2 tamboirj.nes pulse against marimba.

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From the point of view of style, this third movement is eclectic and contains several broad neoclassical brush strokes. The antiphonal style derived from ancient and modern cantillation, the use of contrapuntal imitation, homophony, organum, unison, responsorial techniques, augmentation and shifting layers can all be found in pre-18th century musics. The spinal pulse, multi-metre and displaced accents are more akin to the neoclassic works of Stravinsky. The fourth movement plunges right into the 19th century with its sonata-allegro grand finale style and lush orchestration adding organs, more percussion and upper wind for the 'Hallelujah chorus' which can hardly escape Handelian reference. Nor is this final movement without its Stravinskian haunts with respect to displaced accents and sudden block contrasts. (Part IV p.245-7. score)

Tonality/Mode

Tehillim uses constant points of reference as tonal or modal centres in a non functional way. The centres are indicated by the key signatures. The importance of the A and E tuned percussion, the predominant use of string section as sustained bands of sound and the almost negligable use of accidentals tend to set layers as constant plateaux in the work. Minimal shifts to commonly related keys are through obvious stepwise procedures or the addition or subtraction of one flat or one sharp at a time. Occasionally there is a harmonic shift which appears to

have a shock effect but generally changes to serve to obscure or make an idea a little ambivalent. Certainly the idea of resolution as intended by functional harmony is nowhere represented in this work as the final chords of the work seem to suggest being non resolving. The type and number of changes is detailed for each movement in the following table.

TABLE 9.4

Key Signatures and Tonal Centres in Tehillim

PART I A G E D Tambourine	b 1	#	₽ 1	# 2	} 1	# 2	þi	# 2			(s (r s	sig no.	jn) C jna	of	si are	Lgr e.)	ns	in
PART II A ^b E ^b	b 4	# 5	b 4	b 5	b 4	# 5	b 4	b 5	b 4	# 5								
PART III	# 4	# 5	# 4	#	# 5	# 4	# 3	# 2	# 1	b 1								
PART IV A E	b 1	#	b 1	# 1	# 2	b 1	# 2	b 1	# 2									



Alterations of harmonic centre, alignment and function are intentional, as is the feeling of going away and returning in a simple bland way, Reich's own. Style - The Integration of Elements: Unity and Variety

Tehillim is a well crafted symmetrical four movement work which has the combination of external and internal unifying features coupled with a vast number of developmental procedures and varied changes. Such is the description of a traditional symphony. In looking now at the work as a whole, an attempt to assess its 'style' will be seen against the background of repetitive music rather than its traditional roots.

It is a complex work of 30 minutes duration. It is segmented into parts with different functions arranged symmetrically so that the differences are apparent. The number of continuums presented simultaneously has little to do with minimal music. Rather the emphasis in the above analysis has been to cover the number and different types of changes introduced into each parameter. The single units, cells, changes, pulses are replaced by many elements having greater breadth and numerous interrelationships. The following summary table attempts to code some of the essential unifying and diversifying features in each movement in order to analyse the musical components which shape the piece's overall style.

TABLE 9.5

Unity and Diversity in Tehillim

PART 1	PART 2	PART 3	PART 4	SUMMARY
UNITY 4 single voice themes each theme worked 6 times Arch form	3 contrapuntal themes Parallel organum in 3rds and 6ths. A ^D -E ^D centre	2 Antiphonal themes Held notes Sustained tone Marimba and Vibes	3x2 part themes involving complex antiphonal elements. Each theme worked	Drone and banded layers. All themes women's voices. Intervals of unison,
Descending intervals Stepwise movement lb	4bs	pulse. Canons from high to low register. Slow harmonic movement 4# and 5#	6 times. Hallelujah elements in each theme.	<pre>4th, 5th, 2nd. Pulse. Set roles of wind instruments. Linear assembly of themes. Movement from lesser to greater. Resultant patterns from counterpoint, imitation and stretti Augmentation. High register to low register.</pre>
DIVERSITY				
Thickening instrumentation Key irregularities in da capo sections	Augmentation E, p.112. Embellishment G, p.130. Contrary Motion Instrumental interludes No voices	Modulation to F, p.193 Subtracting #s. Fast rate of change Role changes New solo use of strings.	Variety of speed in themes. Changes in orchestration Many developmental techniques. Modulations.	Length and number of themes. Fragmentation, breaks and silence. New Entries. Dissonance. Embellishment. Hocket.
2#s	5# Key change in Theme III	Hocket, silence. Instruments imitate melodic material. String and wind doubling of voice.		Displaced accents. Solo Strings. Instrumental interludes. Modulation.

Reich's Tehillim does use minimal techniques commonly employed in his earlier works. There are percussive constants, almost continuous vocal melody and much sustained string writing. Techniques such as canon, imitative counterpoint, resultant patterns from overlapping different horizontal lines are hardly new and all appear in Tehillim. Also, there is a tendency to proceed in a single direction in the linear assembly of themes and common approach to registration being from the high voices to low. However it is the sheer number of elements and the rate at which they change that makes this piece more symphonic and developmental than almost all other examples of repetitive music to Techniques chosen as predominant working tools date. in the different movements could be said to be in order:

- I. The canon, and linear imitative counterpoint.
- II. Vertical homophonic and contrapuntal practices organum, augmentation, embellishment.
- III. Antiphony, contrapuntal imitation and voice pairing, vertical layering and modulation.
- IV. All of these practices are integrated simultaneously.

The rate of change is by no means on a fixed self determined and predictable time scale. There are sections working from thin to complex, sudden breaks, steps, displaced accents, and persistent pulses just to prevent the slightest notion of redundancy. The extent of repetitiveness is not very great yet Reich's

symphonic style here is built on compositional tools which themselves are repetitive. Sectional repeats, sustained tone, canon, stretti, contrapuntal imitation, augmentation, embellishment, doubling, voice pairing antiphony, responsorial dialogue are all techniques dealing with constancy and repetition of an original. Reich's use of displaced accents, multi-metre, dynamic fades and use of silence, abrupt dissonance, modulation, sudden orchestral changes are techniques gleaned from a musical tradition built on climax and contrast. A rigourous approach to variety and repetition is apparent in this work in a clear and direct way overtly recognizable in score and sound.

Philip Glass, Einstein on the Beach

Glass's Einstein on the Beach is another milestone in the history of repetitive music. Its dramatic nature demands that it exists by integrating a large number of variables and techniques. Described as an opera it was composed during 1975 by Robert Wilson and Philip Glass and in 1976 it had a very successful European tour including the Paris Autumn Festival with choreography by Andy De Groat and danced by Sheryl Sutton and Lucinda Childs. It combines static theatre of tableaux, scenes with dance, minimal movement routines, obscure symbolism rather than narrative, and recurring musical elements. It is one of the grandest of a series of works by Glass in which he is drawn to music as a dramatist. Others to follow were Satygraha, 1980, on the life of Ghandi and more recently The

Photographer, 1983.

Einstein on the Beach is extensive in length and number of parts as the table below suggests. A performance takes four hours.

In this opera, Glass's attitude toward repetition can be studied at a variety of levels,

- 1. the formal and structural level,
- 2. in his use and type of theme,
- 3. his approach to the individual parameters of rhythm, harmony, orchestration, tempo, dynamics, metre, and
- the type of developmental and transformation processes employed.

FIGURE 9.1

Structural Diagram of Einstein on the Beach

- KNEEPLAY 1 ACT 1 (SC I) TRAIN (SC II) TRIAL • KNEEPLAY 2 ACT 2 (SC I) DANCE 1 FIELD WITH SPACESHIP (SC II) NIGHT TRAIN
- •<u>KNEEPLAY 3 ACT 3 (SC I) TRIAL PRISON (SC II) DANCE</u> (<u>SC III) FIELD WITH SPACESHI</u>P

• KNEEPLAY 4 ACT 4 (SC I BUILDING TRAIN (SC II) BED. (SC III) SPACESHIP

•KNEEPLAY 5.

From a structural point of view, three images, the train, the trial and spaceship recur. The train appears three times, once in each act, the trial three times and the field with spaceship three times. Five Kneeplays act as Prelude and Postludes. When the images recur there is usually an element of transformation. For example, the train's first reappearance bears similarity of perspective to the initial image but is at night, while in the final appearance the train has become a building. Throughout the opera, the music correlates to Wilson's images with respect to numbers of themes and transformation processes.

The Train music is divided into three themes carefully placed and developed.



All the themes are stated on the first appearance of the train (Act 1, Scene I) but all reappear later in the opera as Glass's diagram clearly shows.7

 $7_{\rm Notes}$ to the Booklet accompanying Einstein on the Beach.

Recurrences of the Train Theme



When themes reappear they are never stated in exactly the same form as the original. Elements of texture, orchestration, rhythmic expansion, accent grouping are generally reshuffled to give an ambiguity to the feeling of past and present. The material is obviously familiar but the articulation of it always takes on a new hue for the new context. For example, the third theme of the train music (ex - 3 notation), is first heard in Act 1 Sc I with ensemble and chorus. Then in Kneeplay 2 it is a violin solo with extensive arpeggiation, while in Kneeplay 3 it is an a capella chorale. In Kneeplay 4 the theme is in arpeggio and chorale form, and in Act 4 Sc III all these styles are amalgamated in a grand tutti.

The musical material for the Trial images⁸ is

⁸See other structural diagrams for Trial Scene and Kneeplays provided by the composer in the above source.

handled in much the same manner as the train music. It has internal repetition strategically placed and adds some new elements to grasp the attention. For example, theme one begins on violin accompanied by men's voices and is treated arithmetically, expanding and contracting. The texture builds up with the addition of women's voices before a change to a more chordal second theme for solo instrument. Unlike the train music not all themes in the trial scenes are given at the outset. The third theme in this group is heard in Act 3 Sc I Trial/Prison sung in numbers by the members of the jury accompanied by arpeggiation in the organ.

The music for the third image, the Field has a different structural function from the two preceding images of the Train and the Trial. Both appearances of the Field are dances and the musical material is drawn from elements of the other images. In these dances, the appearance of the spaceship firstly in Act 2 Sc I in the distance and secondly as much closer, Act 3 Sc II, help to give a sense of spatial and temporal movement from background to foreground preparing the intermediate way towards the final scene in which the action takes place in the spaceship's interior Act 4 Sc Glass comments on their structural significance: III. "For me they are two pillars equidistant from either end of the opera, showing only superficial features with the musical content of the other scenes."9 Musically and dramatically they are sections in which

9Ibid.

one can reflect and ponder the existing material with little new musical input. The repetition here functions as a stalling device giving way to the mesmeric actions of the dancers, who physically treat simple movements to a variety of transformation processes involving a high degree of repetition whether choreographed or improvised. Cycles, turns and spirals are treated canonically, in linear repetition or simultaneously in unison in repetitive spatial and temporal units. The dance is built firmly on the musical patterning.

Le vocabulaire gestuel - ... est une combinaison de mouvements de base naturels: courir, sauter, avancer-reculer, tourner s'agenouiller. Des variations interviennent qui modifient les sauts (rebondir sur place, retomber en arrondissant le dos, sauter bras écartés). Les danseurs tous séparés les uns des autres exécutant les mêmes mouvements à l'unisson ou en canon; leur nombre croît ou décroît suivant la difficulté de l'enchainement choregraphique: ... La construction mathématique repose sur la structure musicale et sur le procédé répétitif.¹⁰

The kneeplays relate to each other in a structural sequence resembling rondo form. They can exist apart from the opera as a separate entity. Theatrically they unify the action as short recurring vignettes of two characters sitting standing or lying together on simple furniture, tables and chairs and in the last scene waiting for a bus. Musically the 2nd, 3rd, and 4th kneeplays are in Ternary form and all have theme three as their initial theme. Glass's handling of kneeplays is very similar to the train and the trial

10Lise Brunel "Andy de Groat", <u>Art Press</u> International, 2, 1976, p.24-5. as the formal analysis he gives in the booklet shows. Thematic Style

Looking more closely at the nature of the themes themselves it is possible to find other musical elements being used in the service of repetition. Possibly the most audibly repetitive element is the rhythmic quaver movement wielding a continuous pathway, adventuring, turning, retreading, but rarely stopping. The three train themes quoted all have the basic quaver unit as a continuing feature so that the themes then have linear and vertical pitch direction to explore but not the possibility of the long/short unequal proportion between notes. Lines are fabricated from units grouped together in longer or shorter multiples of the basic unit, heading in ascending, descending or changing directions over varying timespans, a technique Glass has never abandoned. The continual motivic assembly has become Glass's trademark. It is without rest and simply formulated.

The frequent use of arpeggios and scale passages is most apparent throughout <u>Einstein on the</u> <u>Beach</u> as both accompaniment, melodic and linking material. It is particularly noticeable in the solo passage for organ and violin. Simple and hackneyed forms are viable tools for Glass. His use of sung syllables, solfege and counting numbers on pitches can be seen in the same light. The method of construction becomes the content of the music with respect to pitch and rhythms as these themes show.

Ex.9.3, Two Themes: Act One, Kneeplay 1 and



Another interesting feature of the Kneeplay 1 theme is the use of repeated pitches on quaver pulses forming pitch lines rather like embryonic pulsing drones. Generally Glass's style features fast moving quavers rather than the more static lines apparent in this elongated CDE motive. The longer note durations in the bass lines of the two above themes relate as specific motives having a direction function rather than a halting function.

Generally the themes in <u>Einstein</u> have very little lyrical or melodic function except for the first theme on a rising arpeggio in Act 1 Scene II. The proportion of triplet against equal beats gives a wonderful swaying quality to this theme.





It is used extensively in alternation with the theme Glass calls trial theme no. 1, Ex.9.3, providing distinct contrast. The ascending gesture working to a point of rest in the above theme, Ex.9.4, contrasts the more common rising and falling quaver movement in other themes.

Generally the themes bear elements of similarity and contrast both in type and orchestration. In many themes, the kneeplay 2 and 3, trial no.1 and 2, and train no.3, there are two distinct parts with different roles. The bass line has sustained tones and slow moving harmonies while the upper parts have fast moving cells of quavers grouped in twos and fours. Sometimes they are systematically assembled by subtractive, additive or augmentation processes and other times they seem composed at whim. The bass line becomes an audible construction brick rather like a ground bass or passacaglia against which the other parts can be heard to tilt and shift in different alignments. Glass's use of this type of theme which combines rhythmic movement and harmonic movement so symbiotically emanates directly from his earlier work Another Look at Harmony, 1975. In fact parts 1 and 2 of this work were the foundation for Act 1 Scene I Train, and Act 2 Scene I, Field.

Rhythm and Harmony

The importance of the quaver as a basic structural time unit cannot be underestimated in the composition of a single Glass work. Einstein is no

There is almost no use of rests and any exception. sense of metre comes from the expanding and contracting rhythmic groupings of 3 4 5 6 8 12 quavers which become fixed aggregates repeated as rhythmic sets over and over again. Generally the ratio is 1:1 so that when the proportional 3:2 triplet figures appear as in Act 1 Sc II they are very noticeable as a contrasting device. In the following notated example, changes from 4 quaver units to triplets (Act II Sc II) can be noted. As different length cycles, they serve to shift the feeling of bar line and change the flow. Time is experienced as static within the distinct units. The change from one to the other after so many internal repeats brings about a definite shift in the perception of time passing, rather like a jolt. (See Ex.9.5.)

Rhythm is the first consideration in Glass's work with all other musical parameters usually being subservient. In <u>Einstein</u>, harmony is grafted to the rhythm and in many parts they seem to be conceived together.

Glass's overall plan for the opera evolves around a set of five chord progressions given out in Figure 9.2, theme 3, often referred to as 'the cadence' theme. Functional harmony in traditional IV V I cadence and modulation from f minor to E major is implied in this progression as Glass's diagram shows.





ll_Transcription Aline Scott-Maxwell, Monash
University.

FIGURE 9.2

Implied Modulation in the Cadence Theme

Key of f minor f - Db - Bbb
(i) (VI) (IV^b)
A - B - E
- Key of E major -

Glass describes this harmonic scheme, its attraction and implications for repetition in the following way:

What makes the formula distinctive and even useful is ... the way in which the IV^b (B^{bb}) becomes IV(A)of the new key, thereby making the phrase resolve a half step lower. This, in turn, provides the leading tone for the original i(f). As it is a formula which invites repetition, it is particularly suited to my kind of thinking.¹²

The internal harmonic scheme utilizing repetition and close interrelationships between f minor and E major, favours duplication and even redundancy. Glass's extensive structural use of it, occurring five times throughout the opera ensures that the audible familiarity becomes impregnated to a large degree.

In the following table Glass's overall plan of chord progressions can be seen as being subtractive. He builds sections on five chord progressions through 4 to 1.

¹²Philip Glass in Notes on <u>Einstein on the</u> <u>Beach</u>, Part 2, TOMATO RECORDS, A2901.

TABLE 9.6

Subtractive	Processing	of Chord	Progressions ¹³
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No. of Progressions	Types of Chords	Location
5	f - Db - Bbb - A - B - E	Act I sc (i) Kneeplays 2,3,4 Act IV sc (iii)
4	f - Eb - C - D	Act I sc (ii) Act III sc (i) Act IV sc (ii)
3	A - e7 - Bb	Act II sc (i) Act III sc (ii)
2	a7 - g7	Act III sc (i)
1	a7	Act I sc (ii)

The larger number of occurrences of the more complex progressions is in line with Glass's intention for repetition as larger more complex structures require more time space to be audibly perceived as familiar. Glass documents elsewhere his intention to make the musical material easy to grasp and accessible for the listener. The type of chords chosen with lots of stepwise and simple IV and V-I formations help to create this effect.

Transformation Processes

Addition, subtraction, expansion, contraction are the basic tools in Glass's work over the varying

13Glass's own Table from the above source.

time lengths he chooses. This is nowhere more in evidence than in the sections where the choir counts out loud the numerical progressions. The combination, alternation and transformation of the Act 1 Scene II material shows how this is done. (See Ex.9.6)

In <u>Einstein</u>, Glass applies these techniques to harmony as well as melodic and rhythmic contour simultaneously as the following figure shows.

	FIGURE 9.3							
Glass's Process of Harmonic Expansion								
	(f)	(ED)	(C)	(D)				
(1)	4	3	4	3				
(2)	4+3	4	4+3	4				
(3)	4+3	4+3	4+3	(4+3)				
(4)	4+3+2	4+3	4+3+2	(4+3)				

It is rhythmic/harmonic expansion where chords are prolonged over increasing time units.

Small reiterated motives such as descending seconds or arpeggios are often repeated 4, 6, 8 and 12 times before proceeding so that they function as static repeated cycles in a block against which other lines move in a freer ribbon like way. (Act 2 Sc I, II.) The introduction of the passacaglia type bass line has extended the use of cycle in <u>Einstein</u>. In fact it is the contrapuntal layering of the technique that gives this work its force as vertical alignments change position and linear plateaux are curtailed or extended.



¹⁴Transcription by Aline Scott-Maxwell, Monash University, 1982/3. It is in this respect that Glass is approaching a slightly more complex approach musically as he integrates the parametric repetitions through time.

Being a dramatic work it is unwise to consider the idea of musical transformation as an independent notion. Glass and Wilson worked together from Wilson's drawings and Glass has composed the music in collaboration with clear structural guidelines established from the dramatic material, and musical perspectives. Glass's timing of the integration of elements is segmented in definite time lengths which have been broad enough to allow extensive working of few elements. The music's potential function as a part of the total action must be considered. It can be dominant, recessive, reflective, or protagonistic. The static dreamlike sequence of images and the simple repetitive movements and actions form other contrapuntal layers which transform and shift with the music just as the music itself is composed of constant and shifting material. The rate of continuity and change is determined by the relationships of all these simultaneous processes.

Orchestration

Sonority as an element of change has never been high on Glass's list of compositional priorities as he has preferred to use the electric organs of his small ensemble with a few wind instruments and chorus. This opera is scored for the ensemble, small chorus, (6) large chorus (15) and actors (4) and violin (1). The

possibility of a denser sound fabric with the extra vocal contingent is in evidence in the tutti scene where much doubling occurs. The change between this and the solo sections is quite marked and is often used as a technique for sudden musical variety. The role of the violin is central to the opera as it has association with the character of Einstein and his observation of all the events which are passing. The ambiguity of his position as character and spectator is revealed in his spatial location being between the orchestra and the stage performers. Historical allusions to Einstein's perception of relativity and the fact that he enjoyed playing the violin are present.

Solos for violin and organ appear throughout as musical relief: Violin solo Matt 1 Sc II Act 1 Sc II Act 3 Sc I Organ Act 2 Sc II Act 3 Sc I Act 3 Sc I Act 4 Sc II

The tutti of Act 4 Scene III is climactic as the organ, with fast rising scales, heralds the launching of the rocket as all the musicians are lifted up on a structural grid representing the interior of the spaceship.

Integration and Continuity

For the most part the opera proceeds by continuity rather than by contrast. Rates of change

are generally slow and the internal construction of each scene generally changes gradually. On a larger scale there are contrasts in orchestration, tempi and dynamics. (See Table 9.6.)

All of the Kneeplays for example are for reduced means being for five different combinations of resources and not utilizing tutti. The first for chorus and organ, second for violin solo, third for unaccompanied chorus, fourth violin and chorus and the fifth for women chorus, violin and organ.

The scenes containing extended speeches such as Act 1 Sc II and Act 3 Sc I have lighter orchestration so that the soft dialogues can nestle in amongst the other layers in a transparent context. These are followed in each case by very contrasting loud fast movements. The sustained tones and more restrained writing for the Train and Trial scenes in the fourth act are so designed with the solo organ and voice directly preceding the climactic Scene III. These examples indicate a desire for change as well as continuity. The climactic end of the opera is a very traditional device with the kneeplay functioning as a postlude or coda.

While the abrupt changes are easily noticeable, the extent of continuity and repetitiveness can only be ratified through the experience in time of static repetition, prolongation, gradual transformation, expansion and contraction. Witnessing the additive, subtractive, cyclic and formulaic processes in the

TA	BLE	9.	7

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Continuity in the Four Acts of Einstein on the Beach

-	ACT 1	ACT 2	АСТ З	ACT 4
-	KNEEPLAY 1 SC I TRAIN	SC I FIELD/COMPASS SPACESHIP	SC I TRIAL BED/PRISON	SC 1 BUILDING/TRAIN
	Fast Loud Choir. Addition and subtraction. Dense and constant.	Dance. Ensemble and Solo Voice. Fast. Addition and sub- traction of familiar material.	Tutti, slow ascending triad on organ with choir. Dialogue-supermarket. Violin Solo- Mr. Bojangles. Recitation: "I feel the earth." Federal Prison - subtractive process.	Sustained tones in chorus and ensemble.
1	SC II TRIAL - BED	SC II NIGHT TRAIN	SC II FIELD/CLOCK- SPACESHIP	SC II TRIAL/BED
	Violin solo, organ solo, choir flutes. Coffee break. Speech - Men and Women in Paris.	Slow action, fast music. Choir solfege, DO.SI DO.SI Diminution and cyclic transformat- ion. Breaks Many themes.	Fast dance.	Solo organ and voice.
	KNEEPLAY 2 Violin solo. Numerals 1,2,3,4.	Many themes. KNEEPLAY 3 Chorus a capella. Light Permutations of 1234.	KNEEPLAY 4 Chorus and violin DO-RE-MI-FA-SO. Additive and subtrac- tive processing of text.	SC III SPACESHIP Fast, climactic Loud, scalic intense. KNEEPLAY 5 Soft organ, sustained tones. Choir 1,2,3,4. Slow tempo. "These are the days" Violin.

various parameters simultaneously must be viewed in relation to the length of the scenes and the opera as a whole. The actions are few. The narrative is obscure and unrelated. The dance and music are direct and mathematically proportional at all times. Considering the number of art forms involved, dance, action, recitation, lighting, music, the opera is quite an austere work with only one or two elements interacting simultaneously over long durations. In Kneeplay III for example, the lighting permutations hook on to the same numerical sequence as the music, resulting in a mixed media doubling. This proves to underline the process at work rather than obscuring it. There is lots of time for reflection of each new element introduced. It is the way each element is pursued in time which tends to give the ethereal poetry to this opera.

Robert Palmer sums it up this way:-

"Like Glass, Wilson is concerned with apparent motionless and endless durations during which dreams are dreamed and significant matters are understood."15

A magical quality seems to emanate from this tautly structured and patterned work. Its method is the content and it is left to the observer to follow the lines of continuity through the diverse theatrical means without conventional narrative or plot.

¹⁵Robert Palmer, Introduction to booklet accompanying record. <u>Einstein on the Beach</u>, TOMATO A2901, n.pag.

In terms of Glass's own musical output, <u>Einstein</u> must be seen as one of his most complex works yet in no way does it reach the symphonic proportions of Reich's <u>Tehillim</u>. It is interesting that both composers have opted for large scale sectional four part works with finale endings.

La Monte Young, The Well-Tuned Piano

La Monte Young's <u>The Well-Tuned Piano</u> of 1964 is quite different in that it shows the refinement and even narrowing of techniques begun in the 1960's and pursued over a fifteen year period. Young's obsession with tuning and particles of sound is still the main feature of the music. Static and slow moving, it is only the details of working with just intonation on Bosendorfer pianos that have changed, not the musical intention. Young has no desire to expand, enlarge or become grandiose. He is continuing walking his narrow road operating one or two elements in the service of the overtone series.

I think it's very hard to get much pleasure out of equal temperament after you have been liberated to just intonation especially if you like to sustain tones ... sustained tones in equal temperament are a cacophony. ... The harmonies don't line up ... they make beats. They are out of tune with each other. So anybody who sustains tone in equal temperament is ... really up against it. Either he has no ear or he's willing to put up with a lot of punishment.¹⁶

Simple intervals often in parallel motion and linked to the harmonic series come and go. At the beginning there is time for the resonances to be heard

16La Monte Young in interview with Johnny Reinhard, <u>EAR</u>, VOL 7, NO. 5, Dec/Jan 82/83, N.Y., p.5. in their differing contexts and combinations. The piece is a reconsideration of the size of intervals and their possible by-products. Units set up are elongated by reiteration or sometimes spread in arpeggiation, tremolo unequal broken chords, grace notes with emphasis on different notes encouraging different overtones to be excited. In an interview with Johnny Reinhard, Young describes this acoustic technique as 'clouds'.

Each set of intervals produces a slightly different cloud, some common interval going through different sets of initials; like if I keep the same E and $F^{\#}$ through several sets of intervals then the elements of the clouds remain the same. Some of the intervals are more supportive of cloud than others. ... the cloud is just as important as the fundamental notes.¹⁷

The speed of motives and clusters change so that the line flows in an unpredictable way as do the dynamics of the piece from slow and pp, to presto and forte. The rate of change is modular and not predictable. Rhythm is responsible for time passing here, not the drone yet Young has elected a solo instrument with fixed tuned pitches for his improvisations. Young has uncanny ability to hear overtones and it is thus appropriate for him to work crafting them in performance time. The rate of change is biological and acoustically determined and can only be related to Young's own performance sense. In this respect he can be compared with Terry Riley as a composer with his own performance tradition which is

17 Ibid, p.4.
more or less exclusive to the composer-performer. The <u>Well Tuned Piano</u> is radical for Young in its comparatively fast rate of change, abolition of the drone as the dominant constant and fresh rhythmic approach to the harmonic series in shifting linear density. Space and accent, soft melody, fast changes, gradual changes are permissable within the fixed norms he has set for the piece.

1. THE PITCH SET



2. TYPE OF DEVELOPMENTAL APPROACH TO A LINE

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Listening to constants in different contexts is what Young presents. All possible combinations are explored in depth over long time spans before he moves on. The mesmeric effect of the earlier pieces is still here with this piece¹⁸ despite bursts of seemingly frenetic playing. The opening material slow and resonant returns in a rondoesque manner throughout PART ONE in its simple unaccompanied and two part contrapuntal setting. From time to time the change of harmonic centre is radical and overt. Definite decisions are made as to possible places of modulation because in just intonation travelling through the circle of fifths

¹⁸At a performance I attended of this work in Bremen Germany, 1976, a large proportion of the audience lying on the floor fell asleep. The harmoniousness and sense of well being is an intention of just intonation being acoustically perfect intervals.

is not possible.

The work's duration may be up to five hours of continuous movement. The piece itself has been evolving since 1964 to the present. It is generally played in resonant acoustics in a setting of Marion Zazeela's suspended lit cut circles in two pure colours which can blend in the same way as the tuning system. Because the crescents are individually suspended and very light, they tend to move and turn according to the patterns of standing waves. They change as the waves are excited by sound vibrations. The work is articulated to some extent by the acoustic of the performing space.

The emotive content of the music plays a great part for Young, trained in Indian music and he treats the chosen intervals and modes as ragas with their particularly individual moods and feelings. In the following rare excerpt from this work certain things can be noticed.

- 1. The recurrent images e.g. The Young's Boogie in E^{b} occurs three times.
- The emotive rather than musical descriptions
 e.g. Dawn, Brook, Sunlight, Pool.
- The length of each occurrence generally lasting on average between one and four minutes.
- 4. Many references to chords.
- Eclectic musical references: Orpheus, organum,
 Debussy, sequence, chorale, sequence, theme and variations.

Ex.9.7, La Monte Young, The Well-Tuned Piano19

Excerpt "81x25 6:17:50 - 11:18:59 PM NYC (VI 1964-1973-PRESENT)

> Excerpt from "81 x 25 6:17:50-11:18:59 PM NYC" The Well-Tuned Piano (VI 1964-1973-Present)



19Ibid, p.5.

The variety of textures he explores is immediately audible. His improvisation grafts the melody following recurrent stylistic features:

- Single line unaccompanied low and high, left hand, right hand.
- 2 note chords.
- Broken ascending and descending chords.
- Arpeggios.
- Cyclic eddies expanding retreating, in length and pitch.
- Rubato and space, quickening slowing.
- Sustained tones in silence. (Debussian).
- Tremolo.
- Pentatonic patterns.
- Semitonal Oscillation.
- Restricted 2-3 octave range.
- Drones.
- Accented chords, parallel 5ths and 4ths.
- Chosen rhythmic units as modules.

La Monte Young's work is based on repetition and change within extreme restrictions. The long five hour <u>The Well-Tuned Piano</u>, is really a long term refinement of the same work begun in the 1960's, despite its faster changing dynamics and speed. Complexity for Young is immersing oneself more completely in sounds and their by-products. His mature style is the development of his acuity in listening to overtones as signals and sound sources and working with them in real time.

The three discussed works show repetitive techniques in the hands of well seasoned composers devoted to its use. The results in each case are quite different. The amount of redundancy, restriction, development, complexity is quite different in each work. The compositions have their own life forces built to some extent on repetition. The degree that each could be said to be repetitive could vary from listener to listener. The rate of change and number of variables are crafted in context of the works themselves. The dichotomies between repetition and change, unity and variety, continuity, discontinuity are everpresent.

Certainly the number of variables and the speed of change in all three works are possibly greater than in works of first decade but still the interest in restriction, repetition and clarity remains. To generalise and say that all works have developed a more complex style would be naive. Reich's <u>Tehillim</u> despite its number of repetitive and variation techniques, still has a systematic patterning controlled with a very firm hand and many of his other works from the second decade and beyond revert to austerity.²⁰ What is interesting is the way in which the individual composers craft repetition and change so that their personal musical style can be perceived from an

²⁰See Reich's new score <u>Vermont Counterpoint</u> for flute and Tape, (New York: Reich Music Publications, 1982).

artistic and aesthetic viewpoint. Their decisions regarding sound sources, ways of working, and the chosen models and processes, all finally contribute to the spirit and style of their individual musics.

CHAPTER 10

CONCLUSIONS

This chapter aims to draw together several threads running simultaneously through this study in order to glean an overview which mirrors the diverse perspectives inherent from the outset. Firstly the style features common to repetitive music since 1960 will be collated with respect to the chart of APPENDIX Secondly comparisons and contrasts will be made Α. between composers. Thirdly, the national dissemination and geographical flow emanating from the west coast of America will be traced concurrently with historical and chronological observations. Once these are established repetitive music 1960-83 will be summarised and the creative aspects re-examined from the point of view of models and processes. Finally an attempt to place repetitive music in a wider context of new music will be made considering parallels, antecedents, influences and the degree to which the repertoire is innovative.

STYLE FEATURES

The extent of repetitiveness in a work depends upon the interrelationship of individual musical elements and the degree of continuity with which each

is handled. In Chapter 9 this was studied within three major works, yet all the works listed in the chart deserve the same treatment. Repetitive music exists by definition when there is sufficient continuity in enough parameters to be audibly proceeding by repetition rather than by change. It has been seen throughout Chapters 3 to 7 that certain single elements involving repetition have been used in an exhaustive number of ways and contexts.

I DRONES AND II PULSES

Elements such as the drone and the pulse are immediately identifiable to the ear as having a repetitive function, and although composers' use of them does vary, they often appear in direct and overt ways (Chapters 3 and 4). Fast repeating tones and long sustained tones have been used extensively by almost all composers listed. In fact, the greater number of works listed in the Appendix I contain one or the other element. The pulse in particular appears in some form in 45 of the 95 works discussed. A comparison of the pulse and drone columns in Chapter 3 and 4 might suggest that the pulse and drone tend towards being used individually rather than together but this is not the case in many works where drones and pulses occupy different continuums in the music. The point at which a pulse or a repeated pitch may be perceived as a harmonic drone, varies considerably, and in fact the degree of separateness is ambiguous in many contexts

such as the discussion of 'pulsing drone' and decay pieces in Chapter 4.

The extent to which these elements are applied varies a great deal as the discussion of works shows.

III RHYTHMIC/MELODIC UNITS

The third feature which is a very common repetitive device is the use of a small fixed rhythmic or melodic cell. The repetition of small defined units appears in works of determined and indeterminate form. Cyclic motives are fixed in works like 6.8, 6.5, or set as tools from which the performer may improvise, 6.1. A work such as 6.16 contains set and improvised use of smaller and larger cyclic motives.

IV CYCLES

The use of one cycle against another can emit diverse vertical repetitive schemes such as the canon, the phase and imitative counterpoint. The common passacaglia is a type of cyclic formula aimed at having a support function as a harmonic ground 4.11-17. At the larger formal level, sectional repeats are a form of cyclic repetition. Motivic cells and cyclic bricks, large or small, aim to fix pitch, rhythmic and even harmonic elements of the music.

V TRANSFORMATION PROCESSES

In contrast to repetition by exact duplication, repetition through slow transformation is a concept

underlying many style features of repetitive music. Types of transformation processes discussed include the lengthening or shortening of a melodic/rhythmic unit by addition or subtraction (Chapter 5). The elongation or compression of a time unit has been achieved by augmenting or diminishing its duration (5.9 and 6.7). The ways in which this may occur vary, but they can encompass the addition of rests for beats as an audible way of fragmenting a sounding line or conversely, the substitution of beats for rests when prolongation is desired (6.10).

VI VARIATION FORMS

These are linked to cyclic and transformation processes as repetition of a set norm occurs introducing elements of diversity with each appearance (2.9, 2.11). The dichotomy between the familiar and unfamiliar is brought to a head in variation form just as it is in the use of ready-made music built on recycling other peoples' compositions (4.10).

VII SILENCE

The investment in continuity and a high degree of 'sameness' in repetitive music has implications for the use of silence. A quick look in this column in Appendix I reveals that almost no works utilise silence as a stylistic feature. The feeling of space, however, is apparent in many 'decay pieces' and in works using drones in which sounds are activated and allowed to

sustain for long durations unhampered by successive sound attacks. Resonance and psycho-acoustic byproducts can then be studied 3.7, 3.2, 5.2, Chapter 7 : Prima Materia, Charlemagne Palestine.

VII DURATION

The element of duration or length of a work varies from very short (1 minute) to extremely long (30 years). However, as repetition depends on time length for its perception, most compositions are substantial. A large number of the works discussed last between 15 minutes and an hour while several last for extended lengths of time - 5.6, 3.2. It is not possible to generalise that the greater number of repetitive processes employed, the longer the work, as many of the longest are the most obsessively repetitive having the highest degree of redundancy and the most negligable rates of change. However, works using several sections and repetitive processes are almost always longer than half an hour - 6.7, 5.6.¹

IX TONALITY/MODALITY

In repetitive music a common pitch centre is often maintained for a work, or large sections of it. A tonal or modal centre is a way of ensuring harmonic familiarity and continuity. As can be seen from Appendix I, many works have a fixed point of reference.

¹Exception Tehillim, Chapter 9.

Traditional implications of western functional harmony are rarely operant in the hierarchical sense of neighbouring relations. Composers of repetitive music much more commonly fix a point of reference or take the hackneyed and familiar cliches of tonal harmony such as the cadence and use them as a set unit to be treated by other repetitive transformations.

X INSTRUMENTATION

Repetitive music has been made for almost every instrumental combination from the most ancient percussion instruments, through medieval to modern traditional instruments, the romantic orchestra, jazz ensemble and computer synthesis. If generalizations are to be made, then music for small ensemble is by far the most common and that for traditional symphony orchestra the least. Repetitive Music evolved through the experiments of individuals who utilised whatever resources they had at hand. In Chapter 7 the variety of ensemble and group situation was described in detail. Electronic keyboards and mallet instruments (Glass, Reich) are just as prominent as traditional instruments often used in an ad hoc way (Michael Nyman Band). Some ensembles have created their own original instruments, (Max Eastley, L.I.M.E., From Scratch), while those working in high technology contexts have explored new computer-human interfaces, (Burt, Chadabe). Generally instrumentation tends to be fixed to a limited number of timbres and registrations, as

repetition tends to be explored within one sound source rather than between many. For this reason few works utilise changing sonority as aspects for treatment. Psychoacoustics produced by the overtone series, and temperament have been common timbral aspects explored within fixed norms. Several composers have been quite happy to stay with a similar instrumental sound in almost all their works, (Glass, Riley,) while Charlemagne Palestine and La Monte Young have settled for the piano in a large number of their works.

XI REPETITION AS GESTALT

In many works listed in Appendix 1 there is an undeniable investment in repetition as the single unifying source of the music. Repetition as Gestalt has been used to describe the situation where the total processing of the music in time can be attributed to the type of repetition set up. Generally this is most prevalent in works where one or two repetitive processes are set in motion. Then repetition as a continuum is easily perceived. Works of the early 60's were more militant in expressing this single minded intent especially in the early works of La Monte Young² and Steve Reich 'gradual processes'.³ Generally composers interested in formalism and structuralism favoured this in contrast to performers who often

> ²See Chapter 3. ³See Chapter 6.

utilised repetitive techniques and concepts as aids for improvisation, and flexible structures. Some composerperformers have engaged repetition as gestalt, desiring to work within rigorous limits (Gibson) 5.11.

XII MODELS AND PROCESSES AS STYLE FEATURES

The Models and Processes chosen by composers and performers shape all of the other style features because they refer essentially to methods rather than content. They are the touchstones through which music is made real from idea to sound vibration. They carry all the compositional and musical details through to fruition. Models and Processes are interesting as style features because they together are responsible for the way in which all other musical elements coalesce, thus having a filtering function at the macro level of organisation in a work. The types of Models and Processes chosen by composers and performers define limits and priorities which essentially become the overall 'style' of a work. Defining the 'style' of a work is a much more synthetic task than merely listing individual style features. Style is the spirit of the living tissue of the music, an aggregate of characteristics made familiar by the creator/s.

When choices are made with respect to the types of models, whether mathematically systemic, poetic, fixed traditional notation, formal plans, pitch fragments, electronically or instrumentally determined, the style is being set. Priorities are established and

other material thereby becomes excluded. The working mode in relation to chosen models, whether explicit or inexplicit, conscious or unconscious, continues to define and shape the creative process and thus the style of the end result. Pre-performance composition yielding fixed pitched notation, (Reich), can be contrasted with composer-performer ensembles with their own tradition (From Scratch), and independent individual music-makers (La Monte Young, Riley). The degree of performance skill and extent of improvisation allowed varies a great deal from work to work and some composers are obviously better equipped to maintain elements of rigour and repetition within an open free context than others. Repetitive Music has been made through almost every combination of model and process from traditional composition through real time composition by composer-performers through to less planned improvised events. The diversity of working models and processes is surprising especially in the light of the demands of repetition, demands which generally imply limits, rigour and known quantities.

Comparisons and Contrasts

Having listed all of the discussed works within the same set of style features as discussed above and detailed in Appendix A, it is possible to make comparisons across the repertoire of repetitive music. The musical compositions discussed vary in style, although all can be termed repetitive to some extent.

The interrelationship of style features determines the overall image of the work, its quality, mood, complexity, and degree of repetitiveness.

Generally the greater number of musical parameters set as constant, the more continuous the audible result, Chapter 3.1-10. In works where only one or two parameters are worked in repetitive ways, the processes tend to be easily recognizable and the repetition tends to occupy the foreground of the listener's perception. When variables are introduced in greater numbers or at a faster rate, the impact of repetition and continuity is reduced as the attention gravitates to the change factor rather than the constant. (7.15) In a piece like Music for 18 Musicians where crescendos and diminuendo come with the speed of human breath, the feeling of changing dynamic movement and surging has a variety function. When more than one type of repetitive process is used in a linear fashion (6.3) where each movement or section works on repetitive process, or whether different repetitive processes run concurrently (7.14), the dichotomy between repetition and change is greatly affected. If the degree of repetition is extensive enough in each process employed, then the greater number of units may not detract from the repetitiveness, especially if the processes are hooked in to the same continuum over a long period. However, when a greater number of repetitive processes are used in a contrapuntal or disjunct way then the audible result tends to work in

the interests of diversity rather than similarity.

The types of processes and the speed of change varies a great deal from work to work as Appendix A shows. Works with a tick in the extent of repetitiveness column tend to have a slow rate of change and a greater abundance of similar musical material. They are works which have a (subjectively determined) greater relative degree of repetition. Works with ticks in the minimalism column may also score well in the degree of repetitiveness column but their distinguishing features are reduced means and fewer processes. They tend to be reductionist and streamlined in model and process, idea and product.

Composers

Of all the composers listed in Appendix A it goes beyond doubt that the four most important composers of Repetitive Music are La Monte Young, Terry Riley, Steve Reich and Philip Glass. These four American composers have not only been prolific, but their interest in repetition and continuity in musical composition has been sustained over a twenty year period. Between them they have founded, developed and refined almost all the essential repetitive processes and techniques as well as maintaining individual styles of music and performance mode.

La Monte Young's early interest in the internal nature of a single sound and his subsequent preoccupation with duration and sustained sound

continuums really formed the beginnings of repetitive music. Terry Riley's interest in pulses, cyclic eddies and multi-tracked contrapuntal fabrics quickly established rhythmic and compositional verve in real time through improvisation as a performance music based on repetition. His single individualistic contribution is that of the particularly talented composer-performer skilled at grafting repetitive continuums in performance time. Steve Reich and Phil Glass with their ensembles in the mid-1960s created composercentred ensemble musics favouring pulses and blocks of sounds which could be expanded and compressed over varying timelengths, both having a predilection for set processes with slow transformation with more audible changes as a steps between repetitive blocks. Ends of sections or pieces were often suddenly cut off. As time progressed, cycles and vertical contrapuntal processes played a more important part in both their musics. Reich's output expanded to explore diverse directions through machines to changing instrumental sonorities. His pieces, composed in the most Western sense, tend to deal with certain limits pertinent to a specific situation or structure, whereas those of Glass tended to perpetrate similar repetitive techniques and musical results. Glass's rigourous style of fast tempo keyboard pulse works is immediately recognizable although in some later works, he has reverted to solo instruments such as piano and slower softer textures.⁴

⁴SeeDiscography, <u>Glassworks</u>.

Each of these American repetitive composers has maintained a definite social stance. La Monte Young's work is heavily controlled with numerous copyrights with the effect that his music is almost inaccessible due to his obsessive and exclusive behaviour. Riley, coming through the jazz tradition, works as a solo performance artist. Of the four, Reich maintains the most public image as the traditional composer publishing scores and disseminating his work for other musicians to play, even traditional orchestral players.

Most of the other American composers mentioned apart from Gaburo, tend to be composer-performers operating in downtown New York.

The British contingent presents another perspective on repetitive music entirely. Generally repetition has not been their central concern despite their frequent use of it. A much more people-centred if not sentimental tradition has emerged from the post-Cardew days. Salon music and functional harmony have been recycled as a basis for new music. Mathematical systems and bell ringing patterns have been applied as structural repetitive techniques often at the whim of an ad hoc instrumental ensemble in the tradition of 'amateur music'. This music was first community based and disseminated in the collective spirit. In recent years there has been a tendency for single composers such as Gavin Bryars and Michael Nyman to have to compete in the marketplace along with the

conservative new music tradition.⁵ The style and content of the British music has changed with the changing musical context. It becomes more relevant to talk of the latest piece of Gavin Bryars on an individual basis with respect to its own musically defined issues. In <u>Homages</u>, for example, the use of tonality and sonority might well place the work in a romantic lineage rather than having anything to do with repetitive music. The same remark may well be made of Reich's <u>Tehillim</u> although the debt of this work to an abundance of repetitive techniques cannot be denied.

In comparing and contrasting individual works and composers outputs, the impact of America is continually felt. Repetitive Music is essentially American in derivation and style and its distribution throughout Britain, Europe, Australia and New Zealand can easily be traced.

Repetitive Music As a Movement and its Dissemination

In the early 1960s on the West Coast of America in the San Francisco Bay area young composers like La Monte Young and Terry Riley were reacting against the current serial and indeterminate new music trends in search of a new music of their own. A geographical move to New York seemed to provide a more fertile

⁵Michael Nyman's statement in a public lecture at LaTrobe University, June 21st, 1983.

proving ground for musical experiment and by the early 1960s all four major American composers were living there. All four had also embarked on inter-cultural excursions. Glass worked on Indian music for Ravi Shankar in Paris, Reich went to Ghana to study African drumming with the Ewe tribe and La Monte Young and Terry Riley had both become disciples of the great Indian master vocalist Pandit Pran Nath. The continued interest in non-Western music by these composers are important admitted influences and at the outset, were important points of departure from established Western musical practice. In the 1960s these influences were liberating for each composer in the search for a personal style.

A great amount of the early activity of repetitive music happened in New York. Activities of the Scratch Orchestra (London) and the Portsmouth groups were shaping a related British experimental music. La Monte Young's early excursions to Munich and Riley's work in Sweden and Europe set the scene for Repetitive Music's acceptance on a wider market in By 1976 major festivals in Bremen, North Europe. Germany and Paris France were being devoted to the performance of this music and its impact as a genre was becoming established. By the early 1970s, chiefly due to the activities of Phil Dadson of 'From Scratch' returning to New Zealand, and Warren Burt, Ron Nagorka and Ros Bandt's movements between Australia and America and Europe, repetitive music was being imparted,

performed and composed in the Southern Hemisphere.

The rise of Germany, Belgium and Holland as important centres for the professional patronage of this music through numerous performances, festivals and commissions, has shifted the genre from a radical fringe music, into important respected and mainstream musical activity. The commissioning of large scale operatic works such as Glass's <u>Satygraha</u>, 1980 and orchestral works such as Reich's <u>Octet</u> 1979 (Radio Frankfurt) and <u>Tehillim</u> 1981 (West German Radio, Cologne) are cases in point. The following map documents the national and geographical flow of repetitive music.

FIGURE 10.1

National and Geographical Dissemination of Repetitive Music



Repetitive Music 1960-83

Repetitive Music is a recognizable new music genre based on a high degree of continuity and repetition. In the early 1960s it grew out of post Cagean re-assessment of basic musical building blocks, the sound materials themselves. Composition was back on the drawing board.

Obsessive reassessment of each musical parameter brought about prolonged investigations of single norms over extended time spans. The listener, performer and composer became involved in new perceptions of small scale changes within larger continuums. Endurance, perception of details, musical expectations and boredom became the provocative foreground issues, intentionally challenging traditional patterns. Abstract and anti-romantic, the music was shaped by systems, patterns and conceptual reductionism. Limits were pushed and pushed in the same direction. Composers outputs yielded extensive mileage from one idea. La Monte Young's drone and Reich's phase lasted as single subject matter for the first decade. Basic repetitive norms were imitated between composers and a wider circumference of derivative musical work was forthcoming. It seemed there was a new band wagon open for everyone's experimentation. This is ratified in Appendix A where the large number of one note pieces and drone pieces are collated.

By the seventies a large number of single

repetitive techniques had been explored and it was only natural that composers started to use them in combination. With the passing of time and the growing awareness between composer's mutual achievements, a sense of personal style became more important. The abstract, material-centred artform became more personality based. Individualism and a tendency to romanticism have infiltrated the music and its social context over the last decade. The difficulty, rigour and commitment in forging the early concepts in the sixties and initiating performances has disappeared. Audiences are waiting at Carnegie Hall for each new work.

The names of Reich, Glass, Riley and La Monte Young are well known in rock, and classical circles. At one point only the new conceptual art fringe were well acquainted with the work.

The Future

Historiographically it is easy to say that a radical art form grows to a point of flourishing creativity, consolidates and becomes reactionary. This theory could easily be applied to repetitive music over the period 1960-83. The danger of maintaining such a generalization is that it tends to promote a teleological view which obscures the internal complexity and diverse compositional developments and interrelationships that were the essence of the specific musical activities. Nor does such

a generalisation allow for interesting exceptions and hybrid cases which fail to meet the developmental curve implied in the generalisation. Composers like Terry Riley and Gavin Bryars have been extremely individual and independent in their musics from the outset and the fact that some of their work has been important in the history of Repetitive Music is more of a coincidence than an effort or will to be involved in the formation of a musical style or genre. Reich and Glass both adapted repetition as a compositional umbrella and pioneered it with a certain zealousness. Now having carved their international reputations and careers taking large scale works requiring large musical forces in their stride, it will be interesting to see which commissions are chosen, on what basis and to what musical result.

Given that the roots of repetitive music were in simplicity it is noticeable that many composers are presently writing in applied multi-media contexts such as film, dance, opera. Gavin Bryars and Michael Nyman have worked in films, and Phil Glass continues his musical-dramatic 'operas', most recently <u>The</u> <u>Photographer</u>.⁶ Conversely, Reich's reaction to the expansion of musical style is evident in <u>Vermont</u> <u>Counterpoint</u> 1982, a contrapuntal cyclic pulse work for flute and tape. It seems a self conscious move to revert to mono-timbre, duplication and rigourous

⁶Also Phil Glass's new film score for the movie <u>Koyaanisquatsi</u> was heard at the 1983 New York Film Festival.

treatment of one element, in this case vertical intersection of many strands. It recalls his tape and early phase pieces of the early sixties. Reich's choices of medium and compositional processes have always been rigidly defined for a specific context and he is consciously exercising this right as a traditional composer in respect to each work and the development from one piece to another.

The composer-performers, Riley and La Monte Young are continuing their fluid and integrated music as a continuing life-force dependent on their own public roles. Development in this music, largely based on individual listening centres and improvisational ability, proceeds more in the manner of oral tradition than through written composition. The recording industry plays a role in freezing images of this music which would otherwise have remained documented only in people's memories of the composer's concerts. The future of this music lies in the hands of these composers themselves shaped by time and the sociopolitical and economic contexts which emerge.

A Historical Perspective

Repetitive Music 1960-83 has been studied from the point of view of the models and processes involved in order to look inwardly at the content and method of the repertoire. It is also possible to look from a broader perspective considering the relation of Repetitive Music to the wider new music context. In so

doing, it's impact needs to be assessed and immediately the question arises, is or was Repetitive Music an innovative music? In order to answer this question, the essential features common to most repetitive music need to be kept in mind :

> extended duration interest in continuity slow change setting of constants psycho-acoustics transformation redundancy minimalism static state of present continuous abstraction simplicity heightened consciousness of the performer homogeneity rather than diversity attention to detail microscopic perception - heightened listening structuralism

introspection rather than extraversion

While not all of these features need be present in each piece of repetitive music a high degree of repetition in a dominant number of priority parameters usually ensures that the end musical result does contain most of them. An immersion into the sound itself results over a long period and the music needs to be approached with this in-depth attitude to

textural density. This is not exclusive to repetitive music alone but is also relevant to non-Western and electronic musics. Considering the influence of technology and Indian music in particular, repetitive music can hardly claim this as a radical stance. However in the Western new music tradition largely built on serialism and indeterminacy up until the 1960s, it maintained a challenging position. Unity and diversity, tension and release, and a sense of climax were all on a different time scale and dimension. The creative act of the music itself being the outcome of diverse models and processes owed a great deal to the Repetitive music was sharing the rigourous past. application of set norms and systems of serialism and the freer spirit from the 1950s and 1960s which validated change, improvisation and group composition. Diversity of Models and Processes has yielded 'repetitive' results. Concern with the detail of single sound structures and minimalism is common in the work of early 20th-century American experimental composers and extended repetition and redundancy could be said to back date through Haydn to Medieval monophony. Parallels and antecedents are numerous. Isorhythm, baroque figuration, da Capo and variation forms, drone and pulse musics of Eastern, Western and primitive cultures all have features in common with Repetitive Music to a greater or lesser audible content. The techniques used in Repetitive Music are old. The twentieth century has merely provided a time

context which has precipitated their emergence in a revitalised way. Repetition has come under thorough surveillance. The final articulation is determined by the individual artist whose choice of working models and processes sculpt the audible result. It is here that the intrigue of the use of repetition in music continues, past, present and future.

APPENDIX A

STYLE CHART

The following list details specific criteria present in works discussed sequentially in this thesis. The numbering system is simply based with the first number referring to Chapter, the second the order in which it is mentioned in the text. Works are entered once only at their first mention. This is not to say they aren't further discussed in later chapters. This Appendix has three functions:

- The list is intended to act as a flow chart to some degree so that the range of works discussed can be scanned to obtain a general feel for the repertoire of repetitive music.
- 2. The columns set a standard group of criteria common in repetitive music so that each work has to be tabulated according to the same frame of reference. This serves as the best preparation for making generalizations about style as the individual components can be checked through all the works discussed in this study.
- Each work is coded according to broad style conditions which are not always fully covered

in the text. It is possible to gain a more complete view of a piece from the range of data than may be possible in the context of the discussion in the text.

Limitations :-

Decisions have had to be made in explicit terms in order ot meet the codification requirements. If the component exists at all, it is coded. There is no room for middle ground complexity or changing states which are usually the most prevalent in a work. For example if one movement of a 10 movement work has a pulse, an X will appear in the column. Columns left blank mean that style feature is not present. The occasional or possible occurrence of a given feature is indicated by a plus sign (+). Full publication details appear in the text.

The length of works is shown in minutes and seconds (e.g. 3' 40") where it has been specified by the composer or is shown on a recording. Approximated times are shown as hours (h) or minutes (m). Works with variable duration and continuing or incomplete works are shown with the abbreviations <u>var</u> and <u>cont</u>.

KEY TO APPENDIX A

Publishers

- ARC Aesthetic Research Center of Canada.
- BG Break Glass in Case of Fire Anthology.
- Byron Pieces Anthology.
- EMC Experimental Music Catalogue.
- Ear Ear Magazine.
- Ed.A. Educational Anthology.
- HF Heiner Friedrich.
- Kybd.A. Keyboard Anthology.
- Nyman Experimental Music.
- RA Rhythmic Anthology.
- Reck Music of the Whole Earth.
- S Soundings, followed by numeral indicating vol.
- Scratch A. Scratch Anthology.
- Source Source Magazine.
- 218 Press Two-Eighteen Press.
- Verbal A. Verbal Anthology.
- Vis. A. Visual Anthology.
- Voc. A. Vocal Anthology.

- 1	composer	title	yr	nat.	publisher	disc	mode1	cl	nara	acte	ris	stic	s		. 4										length
1								dr	pu	mo	су	ad	su	au	di	ph	im	va	to	ip	pa	mr	ge	\$1	
								drone	pulse	moțives	cycles	addition	subtraction	augmentation	diminution	phase	imitation	variation	constant tonal centre	improvisation	psycho-acoustic	minimalist/reductionist	Gestalt	silence	
2.1	Jones, R.	CircuitTree	74	USA			physical	X	+		x					X	+	X	X		X	X	X	X	cont.
2.2	Neuhaus, M.	Underwater Music	76	USA	Source		physical	x										X	X	X	X	X	X		3h 👈
2.3	Viola, B.	Gong	76	USA			instrument	+									X	X	X	X	X	X	X	X	20m
2.4	Tenney, J.	Wake for Charles Ives	74	Can.	ARC		physical notation		X	X		x	x		X	X	X		X			X		X	5m
2.5	Bryars, G.	The Sinking of the Titanic	75	GB	S9	x	found, not. hymns			X	x	x	x	X			X	X	X	X	X				30m
2.6	Byron,M.	Morning Glory	75	Can.	S10		trad not.		X	X							X		X		X	X			6m
2.7	Gibson, J.	Solo for Saxophone	74	USA			trad. not.		X	X	X						X	X	X			X			4m -
2.8	Shrapnel,H.	Bells	72	GB	RA		space not.			X	X						X		X	X		X		X	10-30m
2.9	Hobbs, C.	Music for the Crumbling Cookie	70	GB	Ed A.		not./verbal		x		x	x	x				x	x	х	X		x	x		var.
2.10	Mason, D.	Summer Music	72	USA	Ed A.		not./verbal		X	X	X						X	X		X		X			var.
2.11	Mortimor, R.	Very Circular Pieces	70	GB	Ed A.		graphic	x			x							X		X		X	X		cont.

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1	composer	title	yr	nat.	publisher	disc	mode1	cl	hara	acte	eris	tic	s												length
1								dr	pu	mo	су	ad	su	au	di	ph	im	va	to	ip	pa	mr	ge	si	
2.12	La Barbara,J.	Circular Song	76	USA	BG	x	graphic	+		x	x							X		x		x	x	x	20m
2.13	Johnson,T.	Imaginary Music	74 ·	USA	218 Press/BG		graphic													X			x	x	
2.14	Hobbs, C.	Song 1 and 2	68	GB	Voc. A.		verbal					x	X			X	x	X				x	x		var.
2.15	Anderson, B.	Crackers and Checkers	77	USA	BG		verbal					x	X				X	х				x	x		var.
2.16	Bryars,M.	Pre-Medieval Metrics	72	GB	RA		St.Augustin De Musica Computer graphics	9	×	x								x				x			var.
2.17	Burt, W.	Hebraic Variations	77	USA	BG		physical/ not./graphic verbal	X		X	x						x	X	X		X			x	20m
3.1	Young, LaM	Three Piano Pieces for David Tudor; Compositions 1960	60	USA	HF		verbal/ actions single events															X	X		var.
3.2	Young, LaM.	Map of 49's Dream 31:VII:69	62-	USA		x	mental	X											x	х	Х	X	X		cont. 23m
3.3	Mahler,D.	Still Life: Michael Kaempf	71	USA	S7 - 8		notated	x								•			x			x	x		25-30m
3.4	Jennings,T.	Piece for Strings	60	USA	St.A		notated	x											x			x	x		21'45"
3.5	Hobbs, C.	Trio	68	GB	St.A		notated	X											x			x	x		33m

		composer	title	yr	nat.	publisher	disc	model	cl	nar	act	eri	sti	cs												length
									dr	pu	mo	су	ad	su	au	di	ph	im	va	to	ip	pa	mr	ge	si	
	3.6	Bowen, E.	Long Bow Angels	73	USA	S7-8		notation	х									x	х	x	x	x	x			21m
	3.7	Gaburo,K.	The Flow of U	73-	USA				х			x							x	X	x	х	x	х	х	22m
	3.8	Klucevsek,G.	Depth of Field	73	USA	S7 - 8		notation	x			x						X	X	x		x	х			5'40"
	3.9	Bandt, R.	Tank Piece No.3	79	AUS			mental	х		x							X	X	X	X	x			x	10m
	3.10	Bandt, R.	E Mode	79	AUS			verbal/ graphic	Х		x	X	x	X				X	X	X	X	x	х	x		12m
	3.11	Parsons, M.	Mindfulness of Breathing	[72]	GB	Voc.A.		notation/ verbal	x											X	X	x	X	x		16m
381	4.1	Miller, T.	Sentinel Night	73	USA	S7 - 8		notation	+				x						x	x		X	X			5m
	4.2	Boyd, A.	Anklung	74	AUS	Faber	X	notation	+				x							Х		х	+			20m
	4.3	Young, LaM.	Xifor Henry Flint	60	USA			verbal		x												x	X	X		var.
	4.4	Riley, T.	In C	64	USA	with disc	Х	notation	x	x	x	x	X	x				х	X	x	x	x				1h
	4.5	Glass, P.	1 + 1	68	USA	Nyman		notated fragments/ verbal		X	x		x						X	x	X	x	x	x		var.
	4.6	Skempton, H.	Drum No.1	71	GB	Scratch A.		verbal		х			x					X	x		x	-	x	X		var.
	4.7	Bartlett, M.	Attempt	73	GB	Ed.A.		verbal		х								x	x	x	x	x	x	x		var.
	4.8	Bryars, G.	Ponekelian Melody	75	GB		x	notated/ verbal found		х	x	x						X	X	X						10m

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1	composer	title	vr	nat.	publisher	disc	mode1	characteristics lengt													length				
								dr	pu	mo	су	ad	su	au	di	ph	im	va	to	ip	pa	mr	ge	si	
4.9	Chihara, P.	Nocturne	68	USA	Source		notation	x		x	x						x	x	X						9m
4.10	Bryars, G.	Jesus' Blood	71.	GB	EMC	x	notation				x	x						Х	X						30m
4.11	Skempton, H.	Waltz	70	GB	Kybd.A.		notation		х	x	x								X			X			10m
4.12	Mortimor,R.	Mediterranean Waltz	72-3	GB	EMC		notation				X	х						x	X			X			3'30"
4.13		Marylands	72-3	GB	EMC		notation				X							x	X			X			3m
4.14	Lampard, J.	The Darkies	72-3	GB	EMC		notation			x	х							x	X			Х			2m
4.15		The Caterpillar	72-3	GB	EMC		notation			X	X							X	X			Х			3m
4.16		The Butterfly Waltz	72-3	GB	EMC		notation			х	X							X	X			X			2m
4.17		The Great March	72-3	GB	EMC		notation			x	X	•						x	X			x			2m
4.18	Shrapnel, H.	Lullaby	72-3	GB	Kybd.A.		notation				Х							x	X	X	-	x			var.
4.19	Melcher, J.	Parlour Music #1	77	USA	Ear		notation		x		X					x			X	X		x	x		var.
4.20	Davis, B.	Round Sugaree	73	USA	Ed.A.		notation	+			x						x	x	X	x					var.
4.21	Fulton, E.	Piano Piece	73	USA	Kybd.A.		notation		+	x	x						x	x		x				x	var.
5.1 5.2	Glass,P. Glass, P.	Strung Out Music in Fifths	67 69	USA USA	Dunvagen	X X	notation notation		X X		x	X X	x					X	X			X X			21m 20m
5.3		Music in Similar Motion	69	USA		X	notation		x	x	x	X	X						X			х	x		20m
5.4		Music in Contrary Motion	69	USA		X	notation		x	x	x	x							x			x	x		15'30"
1	composer	title	vr	nat.	publisher	disc	model	characteristics lengt								length									
------	------------	---------------------------	------	------	------------	------	----------------------------------	-----------------------	----	----	----	----	----	----	----	--------	----	----	----	----	----	----	----	----	--------
- 1								dr	pu	πο	су	ad	su	au	di	ph	im	va	to	ip	pa	mr	ge	si	
5.5		Music with Changing Parts	70	USA		x	notation		x	x	x	x	x						X		x	x			2h
5.6		Music in Twelve Parts	72-4	USA		x	notation		х	Х	X	X	X				Х	X	X		X	X			5h
5.7	Rzewski,F.	Les Moutons de Panurge	69	USA	Scratch A.	х	notation/ verbal		х			x	x				х	x	x	x			х		var.
5.8		Coming Together	72	USA	S3-4	X	notation/ verbal		X			Х	X						X						25-30m
5.9	Reich,S.	Four Organs	70	USA	Universal	X	notation					X		X					X		X	X	X		15-20m
5.10	Nyman,M.	Bell Set No.1	71	GB	RA	x	notation		x			X		x					X		x	X	x		20m
5.11	Gibson, J.	Melody	75	USA	Reck		graphic/ verbal/ notation		X	x	Х	X	X	X	x		x		X	X			X		15m
6.1	Gibson, J.	30's	72	USA	RA		notation/ graphic/ verbal/		x		X	•					X	x	x	x	x		x		20m
6.2	Reich, S.	It's Gonna Rain	65	USA			physical				X					X	Х	x	X		X	X	X		var.
6.3		Come Out	67	USA		x	physical			x	X	•				x	X	x	X		X	X	X		
6.4		Melodica	66	USA			physical			х	x					х	X	х	x		x	X	X		[?]
6.5		Piano Phase	67	USA	Universal	х	notation				X					x	X	x	x		X	X	X		var.
6.6		Violin Phase	67	USA	Universal	x	notation				Х					X	x	x	X		х	x	X.		10-15m
6.7		Drumming	70-1	USA	Universal	x	notation		x	х	x	x	X	x	x	x	x		x		x				1h30m
6.8		Phase Patterns	70	USA	Universal	x	notation		х	х	x					x	x		x		x	x			16'35"
6.9		Six Pianos	73	USA	Universal	х	notation		х		x	x				х			x		X				24m

1	composer	title	vr	nat.	publisher	disc	mode1	ch	nara	acte	eris	stic	s												length
	, interesting the second secon	ci ci c	5.					dr	pu	mo	су	ad	su	au	di	ph	im	va	to	ip	pa	mr	ge	si	5 m
6.10		Music for Mallet Instru- ments, Voices & Organs	73	USA	Universal	x	notation	+	x		x	x	x	x		x			+		X				18'30"
6.11		Music for Pieces of Wood	73	USA	Universal	x	notation		x		x	x	X			x			x		X	X	x		var.
6.12		Clapping	71	USA	Universal		notation		x		x						x		X		X	X	X		10m
6.13	Tennney, J.	Hocket for Henry Cowell	75	Can	Byron		notation/	x							X		X		x		X	X			4m
6.14		Spectral Canon for Conlon Nancarrow	74	Can	Byron		space notation					X			x		x		x		x		X		3'38"
6.15	Roberts, M.	Applause for Small People	77	USA	BG		graphic	x	x		х								X		X	X	X		var.
6.16	Burt, W.	3 x 4 x 5 x 6 x 7	80	USA			physical		x	x	x						X	x	X	X	X		x		5m
7.1	Reich, S.	Pendulum Music	68	USA	Universal		physical	x								x		x	x		x	x	x		var.
7.2		Slow Motion Sound	67	USA	Universal		verbal							x								x	x		
7.3	Dinwiddie, J.	Duet for Lovers	71	USA	S7-8		physical		x							x		X			x				var.
7.4		Drift	70	USA	S7-8		physical		x		x					x			x		x		x		var.
7.5	Eno, B	Discreet Music	75	GB		x	physical diagrammati	cX		x	x	x	x	X	X	X	x	x	х		X	x			30m
7.6	Lucier, A	I am Sitting in a Room	70	USA	Source		verbal/ physical	x										x			X	×	x		30m
7.7	Fontana, B.		77	USA			physical	x										x			X	X	X		3m
7.8	Parsons,M.	Echo Piece	73	GB	Vis.A.		physical/ verbal		X							X	X	X	X	Χ.	X			X	var.

L	composer	title	yr	nat.	publisher	disc	mode1	C	hara	act	eris	stic	S							1.	1	T	1	1.	Tengu
F								dr	pu	mo	су	ad	su	au	di	ph	im	va	to	1p	pa	mr	ge	2 51	
E	Bryars,G.	The Heat of the Beat	72	GB	Verbal A.		verbal	x										x	x				x		var.
1	Amirkhanian,C	.Duet for Ratchets	66 .	USA	S7 - 8		notation	x			x						x	x	x		x	x	X	x	2'55"
	Garland,P.	Three Songs of Mad Coyote	73	USA	S7 - 8		graphic notation	x			x						x	x	X		x	x			3m
	Wetzler, P.	Phasing Tune for Piano	77	USA	Ear		notation		x	x	x					X			x			x	x		8-12m
	Reich, S.	Music for 18 Musicians	76	USA	Reich Publ.	x	notation	X	X	X	x	X	X	x	X	X	X	X	x	X	X		X		lh
		Music for a Large Ensemble	78	USA	[?]	x	notation	x	X	x	X	X	X	X	X	X	X	X	x		x				15'30'
		Tehillim	81	USA	Reich Publ.	X	notation		X	X	X	X	X	X	X		X	X	X			 	X		30m
	Gibson, J.	Multiples	72	USA			number matrix	+	x	x	x	+	+	+	+		x	x	x	x					var.
	Glass, P.	Einstein on the Beach	75	USA		x	notation/		X	x	x	x	x	x	x		x	x	x		x				4h
	Young, LaM.	The Well-Tuned Piano	64	USA			verbal	x	x	x	X	x	x	X	X		x	X	x	x	x	x	x		var.

APPENDIX B

CASSETTE TAPE RELATING TO CHAPTER 8

This tape has major source material being excerpts of performances of Jon Gibson's <u>Multiples</u>. The examples relate to the internal text of Chapter 8 in which details of the case study are discussed at length. They also relate to Appendix E which is a full description of each performance realisation written approximately one year after the performance. Not all realisations appear on the tape.

TAPE 1, 2, SIDE A, B.

Tape Examp	le l	Version One, or	rgan concert	0,	
		3 1/2 minutes.		TAPE 1,	Α.
Tape Examp	le 2	Version Three,	complete pe	rformance	e,
		14 minutes.		TAPE 1,	Α.
Tape Examp	le 3	Version Six, ro	omantic cont	rasts,	
		6 minutes.		TAPE 1,	Α.
Tape Examp	le 4	Version Eight,	individual	tempi,	
		(a) single tra	cks		
		5 minutes.		TAPE 1,	Α.
		(b) mix down			
		5 minutes.		TAPE 1,	Α.

Tape Example 5	Version Nine, complete	e performance,
	25 minutes.	TAPE 1, B.
Tape Example 6	Version Ten, complete	performance,
	28 minutes.	TAPE 2, A.

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APPENDIX C

PRE-PERFORMANCE MODELS FOR THE ENSEMBLE

- (a) Score
- (b) Notes gleaned from composer's letter and made available as pre-performance information.

	I	II	III	IV	v	VI	VII	VIII	IX	x
D	1	16	6	2	24	8	3	48	12	4
c#	2	24	8	3	48	12	4	1	16	6
F#	3	48	12	4	1	16	6	2	24	8
Е	4	1	16	6	2	24	8	3	48	12
В	6	2	24	8	3	48	12	4	1	16
A	8	3	48	12	4	1	16	6	2	24
G#	12	4	1	16	6	2	24	8	3	48

Jon Gibson 11/72

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<u>Continuity</u> Each player starts in the top left column and proceeds downwards at own rate also using silences. Once a column has been played the performer can always return to it and combine different sections in various ways and repeat them continuously for a time before moving on. It may last from 30 mins - 4 hours. You do not have to finish the entire system before the end. No hurry and no urgency.

<u>Pulse</u> The numbers refer to the number of pulse beats per pitch cued from pulse instruments (to be decided in performance). Everyone must relate to he pulse even thugh from time to time players may drop out, sustain, play pulse at 1/2 time. We may also try versions where

- (1) every performer has own pulse
- (2) the pulse changes speed gradually but not radically.

This means the parts have to be known well enough to be able to watch a conductor while <u>in</u> the system. Memorising the pitch sequence will help you so you can work with the model (score) creatively.

<u>Dynamics</u> <u>mf</u> for first sections until piece expands when <u>ppp fff</u> can be explored. Group sensitivity to ebbs and flows as in clouds continuously moving and changing.

Instrumentation pitched keyboard (organ, celeste etc) or mallot inst. Please indicate which genre you prefer

and familiarise yourself with the exact instrument you'll be using. Ring me on 380-2669.

<u>Rehearsal Schedule</u> Monday and Tuesday evenings 7.00-10.00. November 26 and 27, December 3 and 4.

Thanks folks! Ros.

APPENDIX D

Sample follow up Sheets

- (a) Version One
- (b) Other Versions

These sheets were circulated to all players and returned to me. The data provided an excellent common ground for discussion and the written results informed me of the different individual attitudes in the ensemble. For reasons of efficiency a sample sheet only is included here. All data is available upon request.

JON GIBSON ... MULTIPLES

Performer responses to version I, normal free version.

NAME_____INSTRUMENT_____

	I	II	III	IV	v	VI	VII	VIII	IX	Х
D	1	16	6	2	24	8	3	48	12	4
c#	2	24	8	3	48	12	4	1	16	6
F#	3	48	12	4	1	16	6	2	24	8
Е	4	1	16	6	2	24	8	3	48	12
в	6	2	24	8	3	48	12	4	1	16
A	8	3	48	12	4	1	16	6	2	24
G#	12	4	1	16	6	2	24	8	3	48

TRACE YOUR PATHWAY HERE ON THE SCORE.

1.How did you arrive at this?

Tick if texture degree of counterpoint harmonic preferences entered into the choice of pathway. 2.Did you see your role as a pulse at all?

3. How did you interpret the sustain, pulse choice?

4.What was your attitude to silence in the piece?

5.State your opinion of the tempo.

6.Did you at any stage initiate a dynamic change in the piece? What change? .When?

How do you think dynamic levels were established?

Were you happy with them? because_____

7. To what extent did you try to explore timbral changes?

Tick if relevant... use of pedals change of mallets octave doubling other, indicate 8.What was your approach to octave registration? 9.Did you at any point play more than one note at a time? Where and why? 10.How did you feel about the ending?

11.Make any comments as to what you think worked and what you think could be improved.

12.Would you like to suggest a version of your own?

VERSION 7

NAME..... INSTRUMENT.....

Mark your pathway on the model.

What tempo did you choose?

Did you maintain it?

	I	II	III	IV	v	VI	VII	VIII	IX	х
D	1	16	6	2	24	8	3	48	12	4
c#	2	24	8	3	48	12	4	1	16	6
F [#]	3	48	12	4	1	16	6	2	24	8
Е	4	1	16	6	2	24	8	3	48	12
В	6	2	24	8	3	48	12	4	1	16
A	8	3	48	12	4	1	16	6	2	24
G#	12	4	1	16	6	2	24	8	3	48

How were you affected by other people's tempi?

Critically assess your performance?

Critically assess the total version.

3RD

4TH (different divisions of the beat)

5TH (conducted trading pulse instruments)

6TH (changing tempo and dynamics)

7TH (individual tempo in performance)

8TH (individual tempo individually recorded)

THE PERFORMANCES Describe how you saw your role in the different versions.

Which version did you enjoy the most?

Which did you think worked the best?

Why?

Articulate your ideal version of the piece.

OTHER COMMENTS.

APPENDIX E

DESCRIPTIONS OF MULTIPLES PERFORMANCES

The descriptions below are based on a set of full recordings which were taken at every work session. Data collated from the individual members of the ensemble (Appendix D) and discussions shared by the group have played important influential roles.

The descriptions attempt to make a full statement in words of what happened during each performance in terms of the roles of the players and the emanating musical fabric. These performances embody the fusion of all models and processes. Several excerpts appear in Appendix B and comparisons and contrasts of the versions are made in Chapter 8. Some Observations on the Performances see tapes.

The notes which follow are based on (a) performers sheets, (b) listening to the full takes, (c) personal observation as organizer, performer, conductor, and writer.

Version I (Tape example 1)

= 92. Length,

This version functions as an organ concerto. Its slow tempo allowed the inexperience of the players to cope with a lot of new information and motor skills. The insistence on the heavy, if not dogged, pulse reliance by most players almost throughout revealed a desire to get it right rather than any artistic consideration. Pathways were fairly straight forward, with much unison. Orchestrally and dynamically it was very interesting as one overbearing instrument can effectually change a piece from a sensitised communal experience into an individually dominating act.

Version II

At a faster tempo the anxiety rate increased and the energy brought new vitality to the piece. In this performance the ensemble became more confident as the players could hear each other much better due to the more balanced orchestration. Both versions I and II can properly be regarded as preparation for the ensuing evenings.

Take Two

= 176. Length, 7'44".

In this take players began to experiment by

dividing the beat into proportions, playing half speed and using tremolo. Marimba and percussion also tried using timbral effects such as different mallets on different parts of their instruments in order to make more penetrating accents. The version lost quite a bit of tempo and could be seen as a decrescendo over seven minutes. Halfway through there is some interesting motivic stalling going on through the whole ensemble which is an early example of improvising rhythmically as an ensemble, while being prepared to discard the theme in its original form.

Although only 14 minutes in length, this performance version is valuable from several points of view. With respect to form, the ten players entering on cued upbeats gave a straight reading of the beginning of the piece which starts with an almost uniform pulse. At the end of the first column, some players broke away to provide some displaced entries and single accents especially in high voices. At two minutes there is a general lessening off of theme and pulse. A decrescendo at 2 1/2 minutes allowed new canonic thematic entries to be perceived which in turn gathered more impetus. At 3 minutes, the low registered instruments played the theme which was punctuated with motives, accents and fragments from the higher instruments. The extreme space of register between very high and very low instruments here,

accentuated by less themes, although loud, made a very nice contrast to the thick middle ranged insistent texture of the opening. From this point three minutes onwards, the improvising ensemble became extremely adept in changing roles from the basic pulse theme. Pulses were divided and elongated, and silence and sustained tones were introduced so that many small ebbs and flows resulted which gradually accumulated to a denser texture at six minutes. Soft dynamics and a greater use of the original thematic material gently pushed towards potential fortes. At six minutes, the texture changed back to a similarity with three minutes with themes in extreme registers, the bass tones of electric piano and bass guitar and the high pitched motivic cells punctuated with ostinati rhythms. From this point, the spreading of material through the different instrumental combinations of the ensemble provided one of the major thrusts of this take. Tremolos, rhythmic ostinatos, displaced accents, augmentation, diminution, stalling, retracking worked towards interesting vertical alignment. Around 7-9 minutes the texture stayed pretty well in the high pitch area, with celeste, glockenspiel, vibes and xylophone providing sparse rhythmic clipped and biting commentaries over percussion. These were interspersed with imminent motives from lower piano, marimba, bass These instruments finally push towards a low guitar. duet by marimbas accompanied by the vibes theme at 10 which gathers momentum with percussion and woodblock

adhering to the pulse. At 11 the pulse is secured through all the instruments with thematic entries by the marimba piano, bass guitar, gradually fading to a <u>pp</u>. This is the softest emptiest space in the take. It lasts six seconds having only the slightest interruption by marimba, bass guitar, and vibrophone, ringing tones and the odd note from bass guitar, electric piano and marimba. The other instruments are invited to join in a motivic pulse game between players over the celeste ostinato which fades to final notes spread between glockenspiel and bass guitar.

Version Four

= 170. Length, 17'30".

From the slow transparent beginning, lightly textured and soft, if a trifle tentative, the importance of space between sounds especially the space between vertical incidence of sounds is made clear. This version treats the theme in different ways simultaneously because players proceed at their own pulse rate which is a proportion of the first pulse heard so that various levels of augmentation and diminution result. The feel of the whole take is rather laid back because many players chose a slow pathway through the score waiting twice three or four times as long between pulses as other players or when compared with the general feel in other versions. A great deal of focus is placed on duration and the articulation of the end of notes. The natural decay of all instruments defines sound and silence.

Augmentation is a guiding principle in the first five minutes of the piece where a very subtle layering effect of the different speeds of the theme can be heard, although many of the parts require detailed This is because they are not so easily listening. perceivable in their altered state especially when compared with the strong thematic tutti openings of most other performances. Also, the players were much more adept at coming in and out because of their previous experience and the discussion about the necessity of not playing all of the time. This discussion became one of the most active style determinants of this take. Interesting isorhythmic variation and canonic techniques emerged and space became enlarged as a result of the new instruction to treat the pulse freely.

However, the subtle orchestral combination and sparseness cannot be attributed to this alone. It resulted from the ensemble's conditioned choice to let the different sonorities collide and combine in an uncluttered musical fabric. Inverted rhythmic pedals (five minutes celeste) and displaced accents (7-8 minutes xylophone and marimba), and the pitch motives played by the marimba at five minutes, are techniques used throughout by the players. Articulation of single notes is given a lot of attention in this take, especially at eight minutes because of the reduction in information, the slowness and the feeling of enlarged performer-listener perception time. The xylophone,

marimba, celeste and percussion in particular, add well-defined punctuation throughout. They favour grace notes, hard mallets for brittle attack and agressive interruptions to the quiet generating of themes. Various thematic entries can be heard from time to time, especially by the xylophone, marimba, electric piano and celeste. At 5 minutes there is a whole climax of the theme. This contrasts some other sections which seem devoid of the theme and resemble developments of motives or random pointillistic space. In fact the pulse at 9 1/2 minutes, seems to have almost disappeared. In performance it was up to the players to keep a mental record of one of the basic pulse units. Following the celeste which provides a cantus firmus theme, other instruments enter canonically building towards a very homogeneous texture with loud dynamics, full orchestration, almost total preoccupation with the basic theme and adherence to a uniform pulse. This is interesting compared to the type of sound generated at the beginning. However, there was no rule against uniform pulse or unison playing as this particular section shows. Obviously, after the sparser style of the earlier section, there was a need for some group identity and participation. The celeste at 11 1/2 breaks out in augmentation with the theme as a reminder of individual divisions of beat but the piece presses on with fast rhythmic tremolos forming a driving ostinato bass. The wooden instruments, xylophone and marimba, come in with some

very interesting displaced accents. After some ebbs and flow some players join the percussion using their mallets as claves. The common pulse seems quite important at 13 minutes. While the fragments of theme persist and quieten, the fender sadly plays an augmented version of the theme. Violent interruptions on marimba and piano overshadow the theme as they precurse a very sad coda based on the augmented tune on vibes over soft bass pulse.

Version Five

= 132. Length, 16'26".

For the two conducted versions 5 and 6, there was a slight instrumental change with the bass marimba players taking over celeste to leave the conductor free. From the outset the idea of playing the score straight through once as a traded pulse seemed to change many of the players approaches. Apart from the cued pulse being used as a cantus firmus the other players were free to join in to punctuate or develop the material as in other versions. Most players seemed to prefer not to play, so that the theme up to its fifth restatement can be easily detected as a straight take directly following the notation. The resulting texture is very delicate and disparate with empty sonorities and open textures. The first dynamic change is a slight crescendo at six minutes with some interesting work from the electric bass guitar. At eight minutes the theme is augmented and diminished by electric piano and this sparks the ensemble to another

crescendo. Apart from the straight introduction, most of the piece adheres to the conducted pulse with improvised role changes. There is the usual motivic interplay, punctuating accents and canonic entries but the ensemble never really swings into subtle textures of motivic imitation or long supported build ups. The most homogeneous part of this version is from thirteen minutes onwards where the pulse strongly establishes each beat through the ensemble and works in dynamic contrasts. The piano and electric piano push towards a <u>ff</u> eight note conducted climax with accelerando.

The next piece favoured a more extroverted plan as I felt that there was less commitment and energy possibly due to the length of the sessions (tiredness) and the position in the total number of versions (fifth time). It was also possible that the conducting and that the insistence on perfect contrapuntal entries had an inhibiting effect.

Version Six (Tape example 3)

= 112. Length 15'.

With version six the question of the work's identity comes into view. At what point of musical performance processing does the piece cease to contain vital characteristics and change into another piece or something to be cast aside in the composer's eyes? In this performance the presence of a conductor to drive dynamics and speed changes is manipulative. It challenges notions of organic growth coming out of the ensemble and it definitely controls speed of change

affecting the general continuity to a marked degree. Also, the superimposition of a model in the form of a graphic score became an extra conditioner suggesting large changes of pitch, registration, dynamics and tempo rather than slow changes by mutation. The performance lives up to these suggestions and is quite a dramatic and romantic version. The beginning starts mf mid range of the lower instruments in the full knowledge that contrasts would follow in higher In the first three minutes there are registers. several surges and releases achieved by the changing thickness of texture, increasing loudness, slight acceleration and the insistence on the uniform pulse. The mid range vibes, piano and marimba provide support for the theme in electric piano and vibes, with the theme in augmenation in the bass at four minutes. The xylophone, glockenspiel, celeste keep themselves scarce apart from the odd motive, while the marimba provides an insistent pulse pedal. At five minutes the texture quietens and becomes sparse before a re-entry of the theme on the same three instruments. This is a foil for the high ensemble crescendo at a deccelerating tempo with accents intentionally restrained and high woody timbres predominating. The textural range spreads out a bit with piano chords bringing about a reprise of the material heard at six minutes, at eight minutes. The total ensemble improvise around the same motive played in rhythmic unison and harmonically integrated by the piano. At ten minutes more

augmentation seems to slow the pace right down and the spread between the theme on electric piano and pulsing drones on glockenspiel and celeste is very marked. The piano again becomes insistent with its out of tune chords which precipitate the forte at 12 minutes with a slight accelerando against the insistent pulses. At 14 minutes there is a very directed accelerando building up to a traditional climax from the piano's chordal solo against the pulse ostinati in the rest of the ensemble. These break off leaving the two notes on celeste as the last word.

Version Seven, (a) and (b)

(a) Individual tempi. Length, 10'.

The challenge of maintaining individual tempi definitely made every player determined, despite the audible information overload. Everyone insisted on the virtue of his own theme and tempo which was really hilarious. In fact I doubt if any one player really listened to any other for the first full minute. Many players had ear plugs anyway but could still see all the other players. Fast themes, octave tremolos and high fast repeated pedal ostinati came on with a new urgency and many preserved their tempi after being silent for a time. At 4 minutes there is a dynamic climax led by pianos and bass but generally the entire first eight minutes are fairly uniform in texture, dynamics with the bass guitar providing a very bass slow pulse. At 8 and 9 minutes the texture is much more innundated with silence and while the bass holds

the theme as a brick-like foundation, other instruments collide in new timbral pockets. Diverse rhythmic and melodic units coincide in a completely unpredictable fashion. At 10, this take ends quite suddenly and unexpectedly.

(b) Individual tempi. Length, 20'08".

In the second take the players all enter with their own theme with a new confidence and some very controlled articulate playing. Grouped punctuation is common apart from the odd displaced accent and fast pedal. Some players seemed to elect tempi which were in proportion to each other. However, rhythm and timbre provided completely new vistas. At six minutes there is a crescendo and everyone gravitates to the same pulse quickly reiterating it for a time but it is short lived and the piece spreads out to molecular embellishment of the steady bass theme. The minimal unexpected incidence of tones and the eradication of metrical feel amongst nearly all the players except the odd strand of theme, winds a weird pathway towards a very abrupt, clipped and woody end.

Version Eight (Tape example 4a and 4b)

(a) Individual tempi. Length, 10'.

This piece contains eight players, celeste, marimba, piano, vibes, glockenspiel, electric bass, electric piano and xylophone. There are no percussion or second marimba players. The eight solo takes played simultaneously reveal quite different musical features. Every vertical incidence is chance. The choice of tempo

was up to each individual. Beginnings and ends were cued with the studio engineer. It results in an ongoing continuous piece with nearly everyone playing all of the time. The non uniform tempi are maintained because there is no ensemble and no integration. The texture is disjunct with little to no unison thematic or motivic interplay. The feeling is droll if not laid back.

(b) Individual tempi. Length, 10'.

This changes somewhat on the technician's mix of this version as he gates several voices at once into reverberation and brings various colours into different proximity to each other by panning and flanging which puts new timbral interest and dimension into it. There is much more movement from left to right channel, foreground to background and the greater resonance and studio sound resembles a synthesizer. Dynamically there are more changes, especially at 4 and 5 minutes where the bass guitar seems overloaded.

Version Nine (Tape example 5, complete performance) = 96. Length, 25'51".

The final studio straight take confidently and quickly asserts the thematic content without insisting on it for too long. Drones, motivic interplay and several dynamic swells and retreats are present from the outset. Thematic entries are often subtle and soft, many with augmented versions set against quite intricate motivic development as early as 2 minutes in. High drone pulses swing out over the top of the

ensemble to form a security which lasts throughout this first section to 5 minutes where it slackens before surging again. This is the first of four ff tutti climaxes in the piece. The first is at six, the second at twelve, third at seventeen and fourth at 21 minutes. These tutti climaxes are very different in character, serving different functions in the piece. Between the first two climaxes there are many thematic entries and repetitive motives. The xylophone for example is consistently devoted to engaging in ostinati and permeating small pitch constellations in additive and subtractive ways, (see 16 minutes). The second tutti is more pulsing than the first which favoured thematically developed entries. The texture spreads out favouring high pitched fragments in glockenspiel, celeste, and vibes. Percussion gives a spangling quality to the total timbre of the ensemble while the bass instruments, bass guitar, electric piano and piano follow each other through a syncopated rhythmic interplay. This instrumental blend is important for the rest of the piece as they urge the ensemble to gather the pulse towards a thick ff tutti at 17 which is particularly marked by piano chords and longer motives. This fades very quickly to the remaining high pulses and motives over a very soft humming drone from bass marimba and bass guitar. The texture again becomes very sparse, soft and delicate and for three minutes, from 18-21, silent gaps and tiny interspersions from piano and bass guitar fill out a

very expectant tense space. After an almost complete silence, the ensemble together spontaneously enter with a recapitulatory tutti with the theme in unison to a very light pulse - a tremendous example of group interaction. Collective improvisation moves the themes in oscillation over all the octaves of the ensemble, up and down, with swelling dynamics and more canonic entries. The timbres of metal and wood are contrasted and the ensemble quickly disperses the pulse between themselves in a pointillistic way towards a final percussive bell.

Version 10 (Tape example 6, complete performance)
= 110. Length, 28'52".

The concert audience performance began with canonic entries of the subject then led in by the xylophone who also set the tempo. The piece opened out like a fan towards an early climax at $2 \frac{1}{2}$ minutes which quickly subsided to support another canonic set of themes over pulses and ostinatos. From this point the themes spin a homogeneous web. The upper instruments emerge from the group at five minutes to persist for some time with motives taken from the theme and together they work towards a quiet pulse over fender, bass guitar, piano and vibes. The texture becomes sparse from 7-9 minutes and the ensemble maintains a fairly delicate mood supported by repeated two note motives on the xylophone and a thematic Ostinato on bass guitar taken from the opening six Pulse notes (three pitches) of the theme. The dynamic

level increases towards eleven minutes where the percussion encourages a general tightening of texture with more instruments participating in developing motives derived from the pulse theme especially in mid and top range. Pulse drones are heard in bass guitar and bass marimba. The implied pulses at thirteen push to a climax where they steadily conform to a more uniform beat until 15, after several canonic entries at 14. From 15-16 a highly intricate texture develops with ringing metallic themes from glockenspiel, celeste and high piano over an otherwise sparse, unpredictable musical fabric. The xylophone enters rapidly with the theme in diminution which persistently provides a point of reference over the next few minutes. Other instruments add punctuating commentary. There is a gathering of the pulse again at 17 1/2 where a forte is precipitated mainly by the electric fender piano (theme) and piano (tremolo octaves). The sonority expands into a total tutti climax at 19 1/2 which comprises different pulse combinations, themes and motives with instruments freely changing their roles from leaders to support. It ebbs away again at 23 At this point the ensemble is finely minutes. integrated developing material with tremendous cooperation over the rhythmic platform of percussion based on the rhythm MJM, HJJM . The last climax is short lived with themes in bass guitar, piano, marimba and celeste fading quickly to an end. This was precipitated by the fact that the concert had

to end for lectures rather than being the choice of the ensemble.

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