MUSIQUE CONCRETE

A TRANSLATION AND ANALYSIS OF TWO ESSAYS OF PIERRE SCHAEFFER:

L'EXPERIENCE CONCRETE EN MUSIQUE

LA MUSIQUE ECARTELEE

by

DONNA ZAPF

B.Mus., University of Victoria, 1973

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

In the Department of

Music

[redacted]

We accept this thesis as conforming
to the required standard

[redacted]

Dr. John Celona

[redacted]

Dr. Erich Schwandt

[redacted]

Dr. John Michelsen

Supervisor: Dr. John Celona

ABSTRACT

The musical experimentation classifed as *concrete music* arose at a pivotal time after the second world war. Artists were resuming their roles in a world that was visibly in flux. It is not merely conjecture to interpret the music scenario in the early fifties as germinal to musical developments in ensuing decades, or to recognize its value in a broader context as reflective of societal attitudes. Moreover, as time provides an objective perspective, there is no reason that critical analysis of this period should not be undertaken.

Within this context, the treatment of concrete music outside of France has been cursory at best. None of the literature concerned with the progenitive development of electro-acoustic music in France has been translated into English. As well there are few available recordings, the primary source of a music created on tape without score; inadequate bibliographies of composer's works; and a lack of accurate chronological data.

The present study is a translation and critical analysis of the writings of the initiator of *concrete music*, Pierre Schaeffer. For over a decade before the advent of *concrete music*, Schaeffer had been involved in the technical, journalistic and theoretical aspects of the broadcast media at Radio France in Paris (RTF). Out of the context of sound in radio, he conceived of *concrete music* and was uniquely responsible for the first experiments, the initial development of an aesthetic-theory, and a compositional methodology. As well, he chronicled its progression. His writings are the only primary source of information for the first

years of this experimentation.

The translation, *L'Experience Concrète en Musique*, was originally published in 1952 as the third section of a four part book, *A la Recherche d'une Musique Concrète*. The first two sections are journals that outline the development of *concrete music* in the years of its inception, 1948-1951. These journals detail the experimentation with sound: the formal conundrums and the compositional results. They are imbued with the incredible excitement and bravado of open-ended research.

L'Experience Concrete en Musique, written in 1952, is a reflection on the undertaking, an attempt to coalesce haphazard ideology and fortuitous accident into unified theory and methodology. It is in this section that certain axiomatic ideas, emergent in the first *concrete* experiments, become crystallized and conscious. Schaeffer unfurls the banner of "experimental methodology" over musical composition, and solidifies the remarkable concept of musical research. He expands field of musical material to include environmental sound, and espouses an empirical approach to composition. Optimally, constructional ideas would derive from sound rather than from preconceived formal patterns. Compositional material consisted of sound objects created by severing a sound from its causal context, and eliminating dramatic-literary allusion.

This work is also replete with a prescient phenomenology of music. This perspective is a primary aspect of Schaeffer's later work. His book, *Traité des Objets Musicaux*, 1966, as well as research in which he participated pursue a solfege of the sound object -- a detailed inquiry into the perception of sound. This phenomenological concern is present throughout this translation, and three of the seven chapters deal directly

with a subject-object relationship in music.

L'Experience Concrète is exploratory -- a venture into unknown territory. Terminology is not pre-existent and must be invented or improvised. A sense of the obsolescence of the prevailing musical system pervades the work, lending it an eschatological cast (a meditation on the musical apocalypse), even as it speculates on new possibilities and artistic expansion. With all of its inconsistencies, it is a journalistic syncretism of considerable value.

The second translation is a foil to the first. *La Musique Ecartelée* published in this English translation in 1980, continues the premise of an experimental rather than an *a priori* approach to musical composition. In this instance, however, Schaeffer's thought is more clearly evolved. Illustrative references no longer range over the arts as in *L'Experience Concrète*, but focus on contemporary music, using a hypothetical musical apogee (the eighteenth century) as a qualitative parameter. The article is an anatomy of musical experience rather than a presentation of a methodology of music. It provides a referential framework for *A la Recherche de la Musique Concrète*.

This introduction to the translations will clarify terminology and provide contextual references to Schaeffer's thought. Specifically, it will explore those premises about music and the nature of musical experience that are endemic to *concrete music* and shaped its compositional direction. Tools of literary criticism are appropriate to the material and have been used in this study.

[redacted]

Dr. John Celona

[redacted]

Dr. Erich Schwandt

[redacted]

Dr. John Michelsen

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

I Pierre Schaeffer and the beginnings of electro-acoustic music at RTF in Paris

The genesis of electro-acoustic music in France can be equated with the experimental work of Pierre Schaeffer (b. Nancy, France, 1910). In 1948, with vague aspirations of realizing a comprehensive form of expression through sound, Schaeffer brought noise-makers into the *Studio d'Essai* of the *Radiodiffusion-Télévision Francaise* (RTF) in Paris. His *recherche sur les bruits* became *musique concrete*. In 1949, he was joined by composer Pierre Henry; within a short period numerous other composers and musicians were associated with the studio. In 1951, the *Groupe de Recherche de Musique Concrète* (GRMC) was incorporated at the RTF.

Concrete music refers specifically to the initial decade (1948-1958) of electro-acoustic music at RTF. This time span is clearly delineated: 1948 marks Schaeffer's venture into musical composition from his work with sound in radio; 1958 is the year that the GRMC dropped the "concrete" from their name to become the *Groupe de Recherches Musicales*. Schaeffer alone was responsible for the first musically oriented experiments with sound at the RTF. Moreover, he provided the controlling factor in the technical-aesthetic direction that influenced experimentation and composition throughout this period. The "school" of electro-acoustic composition and research that he inadvertently founded in 1948 has continued actively to the present.

Schaeffer's training was in radio technology. Between 1931 and 1934, he studied at the *Ecole Supérieure d'Electricité et des Télécommunications*, and at the *Ecole des Télécommunications de la Radiodiffusion-Télévision Française*, receiving diplomas from these institutions. He subsequently

worked in radio in Paris, Strasbourg, and Marseille before returning finally to the RTF in Paris in 1942. He remained with this organization until 1974.

The venture into music followed naturally from Schaeffer's radio work in the decade prior to 1948. Schaeffer was concerned with the technical and theoretical aspects of sound in broadcasting. For example, he wrote the essay, *Vingt leçons et travaux pratiques destinés aux musiciens melangeurs*, and in 1942 began the study *Esthetiques et Techniques des Arts-Rélais*. His interests were multiple, extending into literature, radio journalism, and music. During this period he produced a biography, *Clotaire Nicole* (Ed. du Seuil, 1942), critical essays, and the radio magazine, *Une Heure du Monde*. He maintained formal contact with the music world by contributing a column on radio broadcasting to *La Revue Musicale* (1938). Indicative of his radio production, throughout 1943-44 Schaeffer created an eight part radio serial, *La Coquilles à Planètes*. Music composed by Claude Arrieu was incorporated; prophetically, however, sound effects provided by Schaeffer played an important role.

Concrete music began in the studio of the *Club d'Essai*. (The name *Studio d'Essai* had been formally changed to *Club d'Essai* in 1944). Schaeffer was closely associated with the *Studio d'Essai* from its inception in 1943 as a training and research branch of the RTF. The very name of the newly created studio suggests the tenor of the work that was to carry over into *concrete music* five years later.

Schaeffer's initial motivation to music was literary. His aspirations parallelled a poetic misconception of music that was particular to

France.[1] Writing, he felt, was able to be explicit only by sacrificing the total experience. Music was a preferable medium because "it did not wish to say anything."[2]

His tangible goal was the creation of a symphony of noises, and in March 1948 he amassed a whimsical roster of noise makers garnered from the Department of Sound Effects of the RTF. This *luthérie* consisted of bicycle horns, gongs, birdcalls, bells, an alarm clock, rattles, and a whistling top. In April, 1948, Schaeffer acquired the entrails of an organ which had been destroyed during the war. The pipes became part of an enormous xylophone which could be struck or blown. Confronted with diverse sound producing instruments, Schaeffer sought a *piano des bruits* that would facilitate performance. Significantly, Schaeffer called his work at this time *recherches sur les bruits*. *Concrete music* had not yet been discovered.

The critical event in the movement towards *concrete music* was Schaeffer's entrance into the sound booth. Instead of concentrating on sound makers, Schaeffer began to work with recorded sound. With the assistance of engineer Jacques Poullin (another engineer, Raymond Vercheres, was also briefly involved in *concrete music* in 1948), the first primitive techniques of *concrete music* were developed. All of Schaeffer's subsequent theory depended on this shift in emphasis; from this point on, use of machines became active and constructional rather than passive.

The first *concrete* action, according to Schaeffer, was the recording of a bell after its attack. Its decay was optionally compensated with the potentiometer. Sounds produced this way were effectively neutralized and could be isolated on separate record discs. Schaeffer speculated on

the creation of an encyclopedic musical instrument, *"le plus général que soit".*[3] Records could be dispensed on individual turntables which would be played successively or simultaneously by means of contact keys connected to a keyboard. Schaeffer imagined himself surrounded by twelve dozen turntables, each controlling a single note. With the naive enthusiasm of an inventor, he considered patenting his idea.

Prolific creation and concomitant sophistication followed immediately. Between April and October of 1948, Schaeffer composed five studies collectively titled *Etudes de Bruit.* On October 5, 1948, the first concert of *concrete music,* the *Etudes de Bruits* under the title *Concert de Bruits,* was broadcast in Paris.

Etude #1 -- "Deconcertante" ou Etude aux tourniquets;

Etude #2 -- "Imposée" ou Etude aux chemins de fer;

Etude #3 -- "Concertante" ou Etude pour orchestre;

Etude #4 -- "Composée" ou Etude au Piano;

Etude #5 -- "Pathétique" ou Etude aux casseroles.[4]

The *Etude aux chemins de fer,* the *Etude aux tourniquets,* and the *Etude aux casseroles* used environmental and 'found' material, while the *Etude pour orchestre* (also titled, *Diapason concertino*) and the *Etude au piano* used conventional musical instruments and traditional musical material. The studies presented particular compositional problems and procedures. The environmental sounds, for example, alluded to their causal context with associative results that conflicted with Schaeffer's musical designs. Schaeffer also felt the need to establish compositional intent in those pieces constructed with 'found' material; he did not want his work to be experienced as random successions of noises. As repetition

was his solution to this dilemma, his collages characteristically repeat sounds. The pieces that used traditional material forced the question of material suitability in *concrete music*. Certain simple manipulations were used constructionally in all of the pieces. Sound was reversed, for example, or played back at speeds different from the speed used in the recording.

Each piece implicated specific compositional ideas. The *Etude aux chemins de fer* was seminal in Schaeffer's recognition of the tension between the associative, allusory quality of found material and 'music'. The use of repetition to imply musical construction became a conscious design in this study. Further, Schaeffer subtitled the piece "imposée" because he had restricted the material of his composition to train sound.

In fact, the primary concern of this study is sound material. Schaeffer's original procedure in the creation of his *poésie ferroviaire* failed. He had visited the Gare des Batignolles and recorded the sounds of trains. Theoretically, these sounds would be transformed in the studio to construct the study. The recorded sounds, however, did not conform to Schaeffer's expectations and he was forced to borrow sound effect discs.

The exercise was a lesson in gathering and recording material for *concrete music*. The effect of the live sound differed from the recorded version heard in the studio. This realization was a confrontation with irrationality and chance. Schaeffer desired rational, intentional procedures for musical composition. Raw sound could not form the primary material of *concrete music*.

The *Etude aux tourniquets* involved the manipulation of an unsuccessful composition which Schaeffer had produced before his

auspicious move into the sound booth. Its original form was a recorded performance of a simple score composed by Gaston Litaize for three zanzi, an African xylophone, bells, and two musical tops. Schaeffer described the effect of submitting these sounds to a traditional score as equivalent to caging gazelles;[5] the manipulated result was termed a radio-isotope of the original recording.[6] Its construction underlined Schaeffer's procedural direction. *Concrete music* was not the recording of unusual sounds or noises, even if they had been previously organized. It was the manipulation of pre-recorded sounds.

The final study, *Etude aux casseroles* is remarkable in being a spontaneous collage. It is a crystalization of sonic play. The constructive elements are surrealistically diverse: a pedagogical recording of diction interrupted by a cough; the sounds of barges on the canals of France; an American harmonica; and Balinese chant. The compositional procedure is totally haphazard. Schaeffer described the "virtuosic exercise of manipulating four potentiometers and eight contact keys" as bringing "rewards to the innocent: Etude #5 (called 'aux casseroles' because it begins and ends with the sound of a turning tin can) is born in several minutes -- the time it takes to tape it."[7] As *Etude aux chemins de fer*, this study gauges Schaeffer's intoxication with sound. He was fascinated by a rotating tin can, and included the sound *en bloc* in the composition. He was becoming aware of the inexhaustible fecundity of *concrete* material.

The *Etude pour orchestre* and the *Etude au piano* used traditional instruments in an attempt to effect compositional continuity. Schaeffer longed for a suitable instrument for *concrete music*," an enormous

cybernetic machine able to satisfy millions of combinations."[8]

> As long as I have at my disposal only two or four turntables to realize approximate sequences, I remain shockingly prisoner of a discontinuous style. Everything seems crudely made."[9]

Two studies for piano, called *Etude Violette* and *Etude Noire* were produced at this time with the assistance of Pierre Boulez. Boulez played chord series in different styles (classical , romantic, and atonal) which Schaeffer recorded. These sounds were considered primary compositional material. Schaeffer then altered them electronically before he deployed them constructionally. The *Etude pour orchestre* consisted of manipulated orchestral sounds interchanged with acoustic piano. Pianist, Jean-Jacques Grunenwald created a live improvisation in response to the recorded segments.

Etude Violette and *Etude Noire* were reasonably effective in obscuring the traditional source, and successful in creating continuity through their homogeneous sound material. *Etude pour orchestre,* however, demonstrated the great discrepancy between recorded *concrete* sounds and the acoustic materials of traditional music. Schaeffer noted in his journal that the forms inherent in recorded and manipulated sounds were completely different from any traditional musical style.[10]

The progression from the initial tentative exploration of sound to the radio performance of *concrete music* took only six months. The groundwork was laid for future composition, and a musical direction was already evident. Of primary importance at this early stage was the use of fragments of pre-recorded sounds to construct compositions. This led to the concept of the 'sound object' (an isolated fragment of sound as a basic compositional unit). In the *Etude aux chemin de fer,* Schaeffer

refers to the geometry of the 'object' (fragment) as opposed to the algebra of the musical tone.[11] Out of this compositional concept, combined with the expansion of available compositional material through recorded sound, arose the consideration of *concrete music* as a radical alternative to traditional music. Three years later, Schaeffer described his initial exploration as an impending musical renaissance.

> The principle of concrete music is contingent on the fact that it is possible to produce and isolate elementary sound material. This can be transformed in various ways and used in composition following a technique in which new resources feed musical invention.
>
> It is immediately apparent as the first experiments were so surprising, that it is not a question of affirming an aesthetic tendency. These initial compositional attempts posed the question of a possible renewal of the whole of music.[12]

In 1949, Pierre Henry, (b. Paris, France, 1927), a student of Messiaen, joined Schaeffer in the studio, marking the end of Schaeffer's isolation. With Henry came a subtle change. Although composition increased, Henry also concentrated on the production of sound objects. The material of *concrete music* suddenly proliferated. Compositions also became more ambitious and longer. The *Symphonie pour un Homme Seul*, for example, a collaborative work of Henry and Schaeffer composed during 1949-50, exceeded twenty minutes.[13]

Concrete music gained public exposure. In 1950, Schaeffer published the article *Introduction à la Musique Concrète* outlining his first experiments. In March 1950, the first public performances of *concrete music* took place in Paris at the Sorbonne and the Ecole Normale de Musique. It was presented as well in Salzburg, Austria and at the Berkshire Music Centre in the United States.

The expansion and continued exposure of *concrete music* gained

momentum through 1951. Early in the year, the RTF provided a studio expressly for *concrete music*. It was equipped with apparatus developed by Jacques Poullin with aid from Schaeffer: the *pupitre de relief*, a device which created the illusion of sound moving through space; the *morphophone* which produced variable reverberation by means of a tape-loop system with adjustable filters; two *phonogènes*, machines for playing tape-loops at various speeds (one was designed to facilitate continuous variation, while the other was activated by a twelve-key keyboard with a two-position transposing switch, producing twenty-four distinct pitches). Multi-channel tape recorders superseded multiple turn-tables.[14] In July 1951, a concert in Paris presented another performance of the *Symphonie pour un Homme Seul* which exploited spatial sonic effects made possible by Poullin's *pupitre de relief*. At the same concert, a new collaborative composition of Schaeffer and Henry, *Toute la Lyre (Orphée 51)*, a concrete opera, was performed. In July 1951, Schaeffer participated in the *Ferienkurs fur Neue Musik* in Darmstadt, Germany.

Concrete music had extended past its genesis in the creative imagination of a single individual to become the beginnings of a 'school' of electro-acoustic composition. In October 1951, the statutes of the *Groupe de Recherches de Musique Concrète* were approved by the director of the RTF. Composers Pierre Boulez, Michel Philippot, Jean Barraque, and André Hodier participated with Schaeffer and Henry in the formation and initial studio work. During 1951-52, Karlheinz Stockhausen was in the studio; in 1952, significant serialist works, the two *Etudes* of Pierre Boulez, and *Timbres-Durées* of Olivier Messiaen were realized at the studio of the GRMC.

At this time as well, *concrete music* received radio exposure throughout Europe, and there was contact and interchange with other composers experimenting with electro-acoustic music. Two concerts held at the Conservatoire in Paris in May of 1952, *Deux Concerts de Musique Concrète*, illustrate the expanded dimensions of concrete music. Far from the modest *Concert de Bruits*, these concerts presented works of Schaeffer, Henry, Olivier Messiaen, André Hodier and Pierre Boulez. At the end of 1952, Schaeffer's chronicle of *concrete music* and theoretical reflection, *A la Recherche d'une Musique Concrète* was published. It was the demarcation of 'the end of a beginning'.

The ensuing five years of the GRMC witnessed continuing compositional activity and the involvement of different composers in the activities of the studio. In July of 1953 and January of 1954, Hermann Scherchen and Philippe Arthuys participated in the first international workshops of *concrete music*. In 1954, Darius Milhaud used the studio to realize an electro-acoustic section of his cantata, *La Rivière Endormie*. In the same year, Edgard Varèse completed *Déserts* in the GRMC studio. Through 1956-57, composers Ivo Malec, Roman Haubenstock-Ramati and Henri Sauguet made an appearance; and Iannis Xenakis began his five year association with the GRMC with the composition, *Concrète PH* for the Phillips Pavillion at the Brussels World Fair.

In 1955, the *Symphonie pour un Homme Seul* was presented by *Le Ballet de l'Etoile* with choreography by Maurice Bejart. In 1956, the first two recordings of *concrete music* were released in France.

The appearance, in 1957, of a special edition of *La Revue Musicale*, vol. 236, *Vers une Musique Experimentale* exemplifies the range of the

GRMC. This edition, produced under the direction of Pierre Schaeffer, was concerned with the international development of electro-acoustic music and contingent fields such as technology in music and ethno-musicology. It had been prepared for release in 1953. The publisher, Albert Richard, withheld the issue because of personal reservations about the application of machines to music. Schaeffer's *Lettre à Albert Richard,* included as the forward to the 1957 publication is an eloquent defense of *concrete music.* Schaeffer outlined the mandates of *concrete music* and in doing so indicated his continuing influence on the ideological direction of the studio.

Throughout this period, Schaeffer did not compose, although he maintained primary connections to music. His activities were multi-directional. He published an essay, *La Voix comme Materiau Musical* as well as an essay on G.I. Gurdjieff. His radio adaption of Gurdjieff's book, *Récits de Belzebuth à son petit-fils* was broadcast. Under the auspices of the French Association for the Study of Phonation and Language, he began a series of lectures at the Sorbonne. In addition, he was director of *Radiodiffusion de la France d'Outre-Mer* (Sorafom) and participated in diverse international music conferences at Barcelona, London, Gravesano, and Venice.

The change of the GRMC to the *Groupe de Recherches Musicales* marks the present period of composition. Pierre Henry and Philippe Arthuys departed to form the *Studio d'Apsom.* New composers, Luc Ferrari, Francois-Bernard Mâche, and later André Boucourechliev joined the reconstituted organization. The change was an indication of the increased sophistication of the work at the studio, accrued through the fertile period of GRMC. Schaeffer's own work, for example, was concerned

with the "anamorphosis" between music and acoustics. The direction of the group as a whole veered towards collective composition and research into musical experience and the perception of sound. Pivotal in the research was the concept of a solfege of sound objects. This was both an inquiry into perception and a pedagogy for listening. These ideas were presented formally in Schaeffer's book, *Traité des Objets Musicaux* (Ed. du Seuil, 1966). As the experimentation became universally oriented, Schaeffer remained a spokesman and a unifying force.

II The Translations

PROLOGUE

The two essays presented in translation are widely separated chronologically. A quarter century falls between *La Musique Ecartelée* (1978) and *L'Experience Concrète en Musique* (1952). In the interim, Schaeffer's work in electro-acoustic music expanded enormously. His explorations included communications, the inter-relations between the sonic and visual arts, and the pursuit of a phenomenology of sound. The electro-acoustic music studio at the RTF in Paris dropped the word "concrete" from its title and had accommodated changing groups of composers. Schaeffer left the organization in 1974. Comparison of *La Musique Ecartelée* to *L'Experience Concrète en Musique*, however, provides evidence of the continuity of Schaeffer's thought throughout the evolution of Schaeffer's work in electro-acoustic music. Basic premises about the nature of music and musical experience perdured.

L'Experience Concrète en Musique was published in 1952 as part of the book, *A La Recherche d'une Musique Concrète*. The book is divided into four sections: I. *Premier Journal de la musique concrète (1948-1949);* II. *Deuxieme Journal de la musique concrète (1950-1951);* III. *L'Experience concrète en musique (1952);* and IV. *Esquisse d'un solfège concret.* The journals chronicle Schaeffer's first experimentation with sound to the establishment of a *concrete music* studio at the RTF in Paris and the incorporation of the GRMC. In these sections, Schaeffer also discusses theory and ideology as it arises in the context of his experimentation. The fourth section was written in collaboration with accoustician, Andre Moles, of the *Centre National de la Recherche Scientifique. Esquisse*

d'un solfège concret provides explanation for the terminology and technical aspects of *concrete music* that appear in the other sections. It is the embryonic version of work undertaken by Schaeffer and the GRMC, concerning a solfege of the sound object. As the word "solfege" indicates, acoustics in *concrete music* were premised on the perception of sound.

L'Experience Concrète en Musique is a theoretical-ideological reflection on the other sections. In this essay, Schaeffer consolidates his thoughts about musical experience; through analogy and comparison, he wrestles with the portent of his experimentation with sound. Unforeseen changes that accompanied the expanded field of sound material appeared to have invalidated the existing musical system. Schaeffer's ambitious essay specified the inadequacy of traditional music, yet also recognized its value. Through an examination of traditional music, Schaeffer constructed a definition of the true nature of music. The conclusions that he reached provided both an explanation of traditional music and a direction for the new art: *concrete music*.

Ideas from *L'Experience Concrète* reemerge in *La Musique Ecartelée*. This article was written in 1978 for the journal of art criticism, *Vanguard*. It was published in this translation in February 1980.[15] *La Musique Ecartelée* presents a paradigmatic definition of the perception of sound, and particularly the perception of music. Implied in this consideration of musical experience is the relational chain, composer-musical object-listener (subject-object-subject) which was formulated in *A la Recherche d'une Musique Concrète*. Also indicated in *La Musique Ecartelée* is the higher purpose of music as communication and knowledge -- ideas that monopolize much of *L'experience concrète en musique*. Schaeffer's

teleological approach to music[16] directed his thought through more than twenty-five years of research.

Ia Musique Ecartelée is also a critical precis of a century of experimentation with sound focusing on the musical trends represented by the work of prominent contemporary composers. Although the shortcomings of the critique are obvious -- Schaeffer, for example, has chosen a predictable roster of composers to represent contemporary composition -- there is an intellectual piquancy about his conclusions. Criticism is ameliorated by humorous sketches that counter the 'high seriousness' of the works described. As arbiter of these works, Schaeffer is guided by his convictions about musical experience.

Most of the problems in the two translations occur in *L'Experience Concrète en Musique*. The piece is troubled by innaccuracies, problematic allusions and inconsistent terminology. The journalistic range, which draws on all the arts, science, mathematics, and musical examples to enforce ideas, is often not elucidating. Rather it confuses the issues at hand.

The terminology that describes Schaeffer's venture into music, for example, is used with varied connotations. Care must be taken with the word "concrete" and its verbal derivative "to concretize". "Concrete" appears in different contexts such as "concrete music" or "the concrete aspect of music". Its meaning becomes complex in antithetical pairings such as "concrete vs. abstract", "concrete vs. traditional", "concrete vs. electronic", and "concrete vs. dodecaphonic". Similarly, the "subject-object" terminology that defined Schaeffer's ideas must be referenced to Schaeffer's definition of musical experience as revealed in the essay.

This relational sequence, subject-object-subject, epitomizes Schaeffer's musical perspective and therefore the tenor of his argument.

Although "concrete" appears in *La Musique Ecartelée*, its use is minimal and peripheral to the main ideas. The "subject-object" terminology does not occur in the article, although the concept of this experiential relationship is implicated.

Considered together, the translations represent a valiant attempt to order the disparate nature of contemporary music by arguing a first cause -- an absolute definition of music. In another sense, the need to define or construct a universal context for musical composition was endemic to composers working immediately after the second world war. This phenomenon can explain the tone of *L'Experience Concrète en Musique*. The fact that this necessity is carried into *La Musique Ecartelée* is not unusual. This latter article is the work of the same man whose involvement with music began during this crucial period.

Towards a definition of concrete music

The connotation of the word "concrete" and the meaning of *concrete music* are problematic. In Schaeffer's writing, they are evolutive and contextually differentiated. This requires a detailed inquiry which in turn will provide a foil to encapsulated encyclopedic definitions of *concrete music*.

In both French and English, the current definition of "concrete" is the adjectival reference to something that is "existing in material form, or as an actual reality, or pertaining to that which so exists",[17] or to that which is material, palpable, positive, existent.[18] This was not the initial meaning. "Concrete" derives from the Latin *concrescere*, translated as *se solidifier* and "to grow together"; it was therefore antonomous to *fluide* and "discrete" rather than to "abstract". "Concrete" approached contemporary usage as a philosophical term indicating an essence or quality "concreted" to substance.[19]

The current acceptation of "concrete" is applicable to Schaeffer's first experiments with pre-recorded sounds. The first connotive layer of *concrete music* refers to its material. It indicates a music that is made with recorded pre-existing sounds. This initial connotation is epitomized in André Boucourechliev's definition of *concrete music* in the 1972 edition of the *Harvard Dictionary of Music*. He states that the "basic idea (i.e., of *concrete music*) is to replace the traditional material of music (instrumental or vocal sounds) with recorded sounds obtained from many different sources such as noise, voice, percussion and others."[20]

Alone, this definition is insufficient. Schaeffer provided a more

substantial description for *Fasquelle's Encyclopédie de la Musique* (1958-61). Here, *concrete music* represents a complex attitude to sound.

> The original contribution of concrete music to sound material was that it facilitated the transformation of a pre-recorded sound. Its form, timbre, tessitura, dynamics, or pitch can all be varied. The resulting "sound objects" can be grouped according to the laws of similitude, as are orchestral instruments. Since each sound will submit to a multitude of electro-acoustic manipulations, the number and diversity of these resulting families is limitless. The manipulations, moreover, retain the living character of the sound. This fluctuation and dissymmetry are always preferred in concrete music over electronically generated sounds.[21]

Although Boucourechliev indicates that the primary material is subsequently manipulated, he qualifies his statement with the indefinite phrase "as a rule". The implication therefore belies the procedure that Schaeffer clearly intends.

> As a rule this material is subjected to various modifications: a recorded sound may be played backwards, have its attack or resonance cut off, be reverberated in echo chambers, be varied in pitch by changing the speed of the record or playback, be modulated in various ways, etc...[22]

This connotation of *concrete music* as music made with recorded pre-existing sounds is in common practice. The simplicity of this definition results in ambiguity rather than clarity. All that it stipulates is the primary source of the material, its selection and isolation. If a composer subsequently wishes to construct a piece, an open field of organizational possibilities and purposes can feed his compositional needs.

This is demonstrated by an examination of other works which unarguably are not *concrete music*, yet use recorded pre-existing sound as primary material. These works may even manipulate the sounds before constructing pieces. The compositional practice of the World Soundscape Project

centred at Simon Fraser University in Vancouver, British Columbia, conforms with the material requirement. However, World Soundscape requires that the originating environmental context be maintained. In Schaeffer's ideology, as constructed from his own experimental works and reflective statements, this would not be *concrete music*.[23]

Similarly, Steve Reich's composition, *It's Gonna Rain*, uses tape-loops of a pre-recorded voice. An extreme example, it serves to point out how easily this definition can be misconstrued. This piece does manipulate recorded pre-existing sound, but it would be inappropriate to associate this work with *concrete music*. *It's Gonna Rain*, derives from a totally different compositional directive (the exploration of sound phasing) and can be seen as the embryogenesis of Reich's current music. It is not apposite to Schaeffer's work.

The comparison of Italian Futurism to *concrete music* is also made at the level of material. Both extended timbral possibilities in musical construction. In the first decades of the century, the Futurists considered that the renewal of music lay in environmental sound. Luigi Russolo, in the manifesto *The Art of Noise*, promoted the use of noise in music and prophetically sketched musical imperatives that were not realized until mid-century.[24] Schaeffer was severely criticized for not acknowledging these artistic precedents.[25] His statement, however, that Futurist work was fundamentally different from his own, is accurate and justified. Paralleling these two chronologically disparate sonic explorations serves only to obscure both. Russolo's concerts with *intonarumori*,[26] like Schaeffer's experimentation, were premised on the need to expand the range of musical material to include noise. Otherwise, as realizations

of scores, the *intonarumori* concerts are equivalent only to Schaeffer's first attempt to compose with noise-makers in the *Club d'Essai*. This aspect of Schaeffer's work lasted only a few weeks. Russolo concentrated on noise-producing instruments throughout his life.

Pre-existing sound, however, did figure in Futurist pieces. The compositions of Filippo Tommaso Marinetti, *A Landscape Heard*, and *Silences Speak Among Themselves* are remarkable in their use of isolated sounds, incongruous juxtapositions, and interceding silence. Within the context of Futurist art, they are comparable to other equally elegant works such as Angelo Rognoni's *Weariness;* Guglielmo Jannelli and Luciano Nicastro's collaboration *Synthesis of Synthesis;* or Francesco Cangiulo's *There is no Dog*.[27] These pieces use images instead of sound or in conjunction with sound; sound is possible but not exclusive material. Here, sensory or emotional images or events are isolated. Deprived of contextual meaning, they gain heightened significance. Marinetti's works are better described as sonic art than music. As such, they are historically important above their continuing merit as compositions. They are different in essence and intention from Schaeffer's work with pre-existing sound. A superficial comparison undermines their significance.

Concrete music cannot be circumscribed at this primary level. A material description remains incomplete. Schaeffer's early writings about his endeavour provide a more comprehensive definition. Within *A la Recherche d'une Musique Concrète* the word "concrete" and the term "concrete music" occur in different contexts. The connotation becomes more complex, but the practice becomes clearer.

In *L'Experience Concrète en Musique*, for example, the word "concrete"

is employed to indicate the contexture of sound or timbre. This adjectival designation is accompanied by the noun "concretization" which Schaeffer uses to mean a total concern with timbre rather than form. (This is an unusual use of "*concretization*" which in common parlance is synonymous with "*materialiser*". In correct usage, a performance of a Beethoven string quartet would be a "concretization".) In this connotation, "concrete" is a characteristic of any music.

Moreover, this generalized designation provides a common ground between traditional practice and Schaeffer's exploration of sound. Schaeffer speaks of Schoenberg's *Klangfarbenmelodie* as the "concrete preoccupation of Schoenberg."[28] This in turn becomes a basis for a sense of historical continuity through the compositional fixation on material.

> In order to clarify later discussion, I will define the development of the concrete aspect of music. A fixation on the contexture of sound rather than pure form is evident in the work of instrument makers seeking refinement, or the increasing importance placed on the orchestra. This tendency is apparent in Wagner's emphasis on the timbre of the horns rather than their melody. It continues in the significant experiments of Debussy and Ravel, and leads finally to Stravinsky...[29]

Using this connotation, Schaeffer juxtaposes "concrete" to "abstract" in an encapsulation of contemporary music into two opposing tendencies: one focuses on material, and the other on increasing formal complexity. Schaeffer uses Schoenberg and Stravinsky to exemplify these tendencies. In a statement, for example, in which he describes the deadlock of the traditional system, he says that "contemporary music is restricted by maintaining a traditional method of 'making music'. And this applies to abstract, formal considerations as well as to the concrete aspects of music."[30]

"Concrete" as the material of sound again gives only a partial

description of *concrete music*. Schaeffer acknowledges that *concrete music* does not exclusively describe the material content of his musical exploration but consideration of form as well.

> Certainly, if a "concrete" school exists, the word "concrete" must be taken as a broad appellation that is both provisionary and incomplete. The concrete aspect of concrete music is evident to the point where it demonstrates the need for abstract methodology. If concrete music meant only the "concretization" of music, it would continue an historical evolution in which composers and instrument builders, (the makers of viols and keyboards, wave generators and trautoniums) rival each other's ingenuity. It would be nothing more than new instruments substantiating conventional procedures. (German electronic music is a case in point.)[31]

The 'theory' of *concrete music* evolves through *A la Recherche de la Musique Concrete*. *Concrete music* initially implied a specific compositional practice with definite constructional imperatives. It was necessary in *concrete music* to abstract the sound from its source before attempting formal construction. According to Schaeffer, the first discovery that led to the development of *concrete music* was the recording of a bell after its attack.

> I can say without hesitation that the real invention occurred when I manipulated bell sounds. The separation of the resonance from the attack was a generative act. The whole of concrete music was germinally contained in this truly creative action on sound.[32]

The practical development of *concrete music*, as nature of this discovery indicates was one of increasing efficacy in abstracting sounds from their causal sources and seeking new means of formal construction. Through 1949-50, Schaeffer even speculated about a theory of *concrete music* that rivalled the ideology of the electronic music studio in Cologne. It strove for a microscopic level of analysis and synthesis in order to attain transmutation not just transformations. Schaeffer's

calibrations involved time rather than frequency; his basic value was a tenth of a second, at which level he stated that qualitative changes became possible.

> If I achieve a more intricate, microscopic level of synthesis and analysis, my combinations exceed transformations. They become transmutations. I would gain control of matter as well as form. A closed record groove is of the order of the second. Everything changes when my analysis is at the level of the tenth of a second. Anything is possible. At this level, a bell becomes a human voice, the voice becomes a violin, and the violin the cry of a gull. Patience and a machine capable of computating the enormously complex numerical manipulations would be necessary.[33]

> At a tenth of a second, phenomenon are too brief to be perceived as form or matter. All analysis and synthesis that occur at this level influence both matter and form. This action would be so radical that the initial sound would be unrecognizable. Noise vs. musical tones, drama vs. symphony would no longer be considerations. What would emerge would be new material for new sonic constructions.[34]

Developing this theory, Schaeffer defines form and matter in music as deriving from the same elements: frequency, duration and intensity. Matter is permanent, however, while form is varying. *Concrete music* is seen in this context as a "physics of form" rather than a "chemistry of material" as in traditional music.

> It is not surprising that musical problems have hitherto appeared as a chemistry of material and not a physics of form. Music is postulated on the physical principle of resonance, an architecture of frequencies. Frequency, algebraic in nature, predominates in music to the extent that it is almost inseparable from the musical phenomenon. Music becomes abstract and without a sensorial context. Contemporary composers must restore its plastic characteristics.[35]

In addition to speculation on form, Schaeffer discusses the compositional process of *concrete music*. An early attempt to explain *concrete music* contended with the conflict between the use of environmental sound and the traditional system. The process which he describes compares "traditional" or "abstract" music to "new" or "concrete" music.

Traditional Musical	New Music
(called abstract)	(called concrete)
Phase I Conception (mental)	Phase I Composition (material)
Phase II Expression (notation)	Phase II Working Sketch (experimentation)
Phase III Performance (instrumental)	Phase III Material (fabrication)

> Traditional music is termed "abstract" because it is conceived mentally, notated theoretically and finally realized instrumentally. Concrete music, however, begins with pre-existing material, borrowed from any sound source, whether noise or musical tones. It is then composed experimentally by direct montage. After successive approximations, it achieves the compositional intention of the working sketch. Ordinary musical notation is impossible in this situation.[36]

The experimental aspect of this process is emphasized by Schaeffer's comparison of *concrete music* and the electronic music of the Cologne studio. This antonymous pairing opposes the experimental method and empirical approach characteristic of *concrete music* to the preconceived systems that figured doctrinally in Cologne.

Allusions to the essential nature of *concrete music* appear in other antonymous pairings. In *L'Experience Concrète en Musique*, Schaeffer again differentiates between *concrete* and traditional music in an analogy with prose and poetry. *Concrete music*, like poetry, according to Schaeffer was concerned with the substance of its material, while traditional music, like prose, was concerned with signification. Also in *L'Experience Concrète en Musique*, *concrete music* is compared with dodecaphonic music as the progressive edge of contemporary music, using other material and seeking other formal possibilities beyond the linear organization of pitch.

The ultimate complexity of the term "concrete music" is evident if one observes the evolution of the meaning through *L'experience concrète*.

Schaeffer's phrase, "the concrete aspect of concrete music" points out the root of the confusion. Schaeffer has used the word, "concrete" in juxtaposition with the term, "concrete music" which is significative as a unit. The context makes the meaning of "concrete aspect" clearly equivalent to the contexture of sound. "Concrete music", however, remains undefined. In the many references to *concrete music* in *A la Recherche d'une Musique Concrète*, it is evident that Schaeffer himself is pursuing definition. *Concrete music* absorbs the additive layers of Schaeffer's thought. It is evident that "concrete music" refers to a complex ideology and not a singular meaning.

Concrete music is synonymous with Schaeffer's early experimentation with sound; its meaning is accretive through *A la Recherche d'une Musique Concrète*. Through the fifties, as the musical experimentation of the GRMC became more sophisticated, the term lost its import. Its designative problems are inherent in the word "concrete" as well as in the accumulated history associated with *concrete music*. Significantly, the word "concrete" was omitted when the GRMC was restructured in 1958.

Concrete music, therefore, is a historical-ideological reference to an aspect of the development of electro-acoustic music. It is not a generic term. Morover, its time-frame is specific. Schaeffer's work with the GRM, for example, cannot be equated with *concrete music*. Schaeffer himself sounds the death knell over the significative use of the term "concrete music". In 1966, in the preface to *Solfège de L'Objet Sonore* he states that "the most sterile dispute, obviously, is that between the abstract and the concrete which are both present in all objects."[37]

Throughout the introductory text, the term "concrete music" has been

italicized whenever it refers to this idea complex. When the adjective "concrete" modifies a noun other than "music", but retains this connotation, it is also italicized. In the translations, quotation marks and italicization of this term correspond to the original; the varying connotations of "concrete" are discernible in context.

The subject-object reference

Schaeffer uses the words, "subject" and "object" extensively through out *L'Experience Concrète en Musique*. These words refer specifically to Schaeffer's definition of musical experience represented by the paradigm: subject-object-subject. The two subjects of the paradigm are the composer and the listener; the object is the interceding sound.

The musical object (and therefore the entire paradigm) owes its existence to the recording of sound. With recording, a sonic construction is 'objectified' as sound; this 'objectivity' is not present in a score or a performance.

> These same instruments (i.e., of *concrete music*) extract the sound entity from its ephemeral milieu, allowing it to be reproduced. Its identity is crystallized. This music exactly corresponds with its performance, integrating design and realization, mind and matter. Thus, the record or tape irrefutably contains the "musical object".[38]

Although not specified in *L'Experience Concrète*, the object can be separated into a musical object and a sound object. The sound object is the primary compositional material, the musical object is the aesthetic product which has been created. This distinction underscores Schaeffer's attitude to music and the composer's mandate.

The performer is absent in the paradigm, and given only cursory mention in both translations. This is an obvious reflection of the compositional situation that accompanied the first work in electro-acoustic music. Speculation on the demise of the performer appeared ubiquitously in composer's writings throughout the fifties. Pierre Boulez, for example, spoke of the performer as if his obsolescence was inevitable. He states that "we need only be disturbed at the passing of the performing artist if part of the 'musical miracle' goes with him."[39]

Schaeffer implies the preferential replacement of the interceding performer in *L'Experience concrète*. He states that the limitation of music is a limitation to what can be notated and performed.[40] In the latter case, the limitation is the musical pulse, a somatic reference to the human being. The alternative in Schaeffer's terms would push beyond such anthropomorphism to reflect a greater reality. He asserts Science as the means to exceed human limitation.

> Science leads minds to conceive the inconceivable. It opens dimensions beyond those that our senses perceive. In this instance, it demonstrates that the physical and metaphysical rhythms of the world cannot be measured with muscles or metronomes. If music aspires to the language of gods, more complex and therefore objective constructions must be investigated.[41]

In the translations, the word *sujet* has always been translated "subject" rather than substituting "composer" or "listener", since the use of the term implies "subject in relation to object". Where the use of "subject" alone might cause confusion, it has been qualified with the words, "listening" or "composing".

The word *objet*, similarly, has always been translated as "object" because of the implied relation. *Objet* occurs in one instance outside of Schaeffer's context. Ernest Ansermet uses the word in the statement: "*Le musicien se donne moins à une oeuvre à faire qu'à une nouvelle maniere de faire, à une nouvelle technique, à une nouvelle type d'objet...*"[42] It would have been more consistent to translate *nouvelle type d'objet* with a neutral phrase such as "new musical entity". However, Schaeffer quotes the phrase later in the text. It is very clear that Schaeffer's use of the word *objet* refers to the subject-object-subject paradigm. Further, by association, this reference is cast into Ansermet's statement.

The explication of musical experience forms the basis of Schaeffer's conception of music. While "concrete" loses importance and meaning in the interim between *L'Experience Concrète* and *La Musique Ecartelée*, the subject-object-subject paradigm remains pertinent. Schaeffer's diagrams of musical listening, crucial to *La Musique Ecartelée*, are premised on the paradigm. Moreover, Schaeffer's research has rested on this conception of musical experience.

Inaccuracy in the text :

L'Experience concrète en Musique is characterized by a synchretistic and homiletic style. Schaeffer uses extensive analogy to elucidate his argument. The illustrations however are sometimes innaccurate or obscured; Schaeffer defined the analogous reference according to his needs.

Most of the problematic references are obvious; their subjective distortion, in an ironic reversal, underlines Schaeffer's ideas. This is the case with the use of Schoenberg and Stravinsky to epitomize specific trends in contemporary composition. Similarly, it is apparent in the use of Bach and Mozart to differentiate between self-referential and 'universal' musical languages. The reference to the piano and equal temperament is simply inaccurate.

Schaeffer's argument concerning musical 'authenticity' uses Ansermet's analysis of the primacy of the fifth in music. The interval of the fifth and its function in tonality provoke "an authentic resonance at the depth of human sensibility."[43] This argument is speculative, as are Schaeffer's other references to psycho-acoustic phenomena (Strickler's interior melody, for example, or nascent concrete music in the human body). This speculation, however, indicates Schaeffer's attempt to endow his sonic experimentation with definition and purpose.

The use of non-occidental music appears ethno-centristic. Serious ethnomusicological studies, however, have been undertaken in connection to the GRMC and the GRM. Schaeffer's sympathy with this music is obvious. Moreover, he is insightful in noting that possible redefinitions of occidental music will come from the study of the function of music in

other cultures.

Finally, Schaeffer's extensive use of Paul Valery's essays, *Man and the Seashell* and *Poetry and Abstract Thought* demand comment. Schaeffer's quotation of *Man and the Seashell* to justify 'found' sonic material as human or musical is confusing. Although Schaeffer's argument is established causally, the quotations from Valery's essay do not appear in their original sequence.

Man and the Seashell is a lucid discussion of human activity, opposing reason and will to organic irrationality. Valery posits that man's rational mind explores the world in terms of itself. Its inquiries imply the question: "How is that made?" Valery uses the example of the seashell to indicate that nature eludes anthropomorphism and reason. Ultimately, the construction of the shell cannot be explained. Schaeffer's use of this essay avoids this argument.

Similarly, the distinction between prose and poetry, garnered from *Poetry and Abstract Thought*, is contested even in terms of literature.[44] The general application of "prose-poetry" to the arts serves to situate Schaeffer's musical activity as part of a universal tendency. The use of this essay, as in the case of *Man and the Seashell*, is a marriage of convenience.

Footnotes

The author's footnotes in *L'Experience Concrète en Musique* have been indicated with asterisks and included in the body of the text. Editorial footnotes are numbered and appear at the end of the essay.

III The premises underlying the experimental method: a critical examination of *concrete music* in reference to *L'Experience Concrète en Musique* and *La Musique Ecartelée*.

Fundamental to *concrete music* was an experimental methodology. Schaeffer emphasizes this in *L'Experience Concrète en Musique* and reiterates it in *La Musique Ecartelée*. The necessity for experimentation developed concurrently with the expansion of musical material through electronic techniques. The traditional musical system was unable to fulfill the constructive demands of new sounds; Schaeffer sought an alternate system to replace it. He proposed an "experimental procedure in music that presupposes the scientific method where theory is controlled by the result."[45] Experimentation was established as the open-ended answer to a problematic situation.

The myth of neutral scientific research, however, is untenable; a directive consisting of pre-established concepts always formulates the inquiry. The direction of Schaeffer's experimentation was constituted by fundamental precepts. These in turn paralleled his aspirations for *concrete music*.

The insecurity regarding music and music making that prevailed in the early years of *concrete music* studio created a pressure to define music. No available system seemed adequate in the face of new material and means. The prevalent instability in music experienced by composers in the early fifties is illustrated by a statement of Ernest Ansermet that Schaeffer quotes at the beginning of *L'Experience Concrète en Musique*.

> It is impossible to know from his behaviour if the composer still knows how or what to create, or even why he is creating. The creative imperative, no longer present, must be fabricated. During the inter-war years, composers assumed procedural hypotheses, seeking music outside of its realm, their search exacerbated by a sense of lost time. Less concern was directed towards composition than to new methods, new techniques or new objects...
>
> When art loses its motive, dogmatism and formalism are substituted for creative purpose.[46]

In Schaeffer's view, the lack of direction that Ansermet attributes to the inter-war years still pertained. Since nothing definitive could be assumed about music, composers were forced to justify their works and create their own contexts.

There was no singular, ubiquitous reaction. The composers involved in other progenitive work in electro-acoustic music at the *Studio für Elektronische Musik, Nordwest-deustcher Rundfunk,* in Cologne, Germany accepted music as self-referential. The ontological consideration of music was the ghost behind the Cologne activity. It allowed both the systematization of sound as well as the comfort of the historical continuity which they posited. Herbert Eimert indicates this historical hypothesis in an article published in *Die Reihe* in 1955.

> In the history of the "Music of our Time" electronic music might be regarded as a final chapter or even a postlude...
>
> But let us see the situation another way with electronic music as the focal point of a progressive development, connected to the most recent school of pointillism. Next comes the only recently discovered music of Anton Webern, a point of departure for contemporary composers, then Schoenberg's twelve-note music, then the so-called 'modern classics'. (i.e., Stravinsky, Bartok, and Hindemith) In this arrangement we have at least a certain inevitability of human progress; what was seen as a postlude now seems like our prelude.[47]

The first tenuous attempts at constructing pieces with electronically generated sound were placed within a historical-stylistic framework.

Schaeffer's response to uncertainty, on the other hand, led to an investigation of musical experience and the proposal of an experimental approach to composition. The immediate and pragmatic problem in *concrete music*, as in electronic music in Cologne, was one of organization and construction.

> As soon as the concept of concrete music arose. . . it was exceeded not only by an abundance of new material but by an explosion of formal possibilities. But unlike the new instrument builders, concrete music is not seduced by this proliferation. Instead it demands an enumeration of these haphazardly liberated objects, an inevitability in their use, and a methodology, even if founded only on hypotheses.[48]

Since the traditional system did not offer an applicable theory, one had to be formulated. In Paris, this search largely proceeded from the sound material. The empirical base of *concrete music* was the innovative aspect of Schaeffer activities. In this regard, Schaeffer stated that "concrete research . . . does not rigidly prescribe procedure. Instead it counsels discretion, reliance on the ear, and respect for the inherent properties of the object under examination."[49]

Schaeffer's experiments, however, did not just seek new ways of composing music. He believed that under current conditions, composition was impossible except as experiment. This idea resulted from his definition of musical experience. Traditionally based, this definition established the necessity of a composed piece, the musical *object;* a composer, the *subject* who creates it; and a listener, the second *subject* who responds to it. In order for the entire procedure to function (in Schaeffer's terms to be an 'authentic' musical experience) there had to be some correspondence between the sonic form of the composition and a form intrinsic to human sensibility.

Schaeffer considered the tonally based traditional music system to be 'authentic' because the frequency ratios that outlined the octave and fifth were connected to man. He states that "occidental music is defined by the function of the dominant",[50] and that "the mystery of music is contained in an affective correspondence between human sensibility and a ratio representing a relationship of frequencies."[51] This system would be invalidated when, as in dodecaphony, its materials did not conform to these pitch relations. Moreover, since its 'authenticity' was contingent on pitch, the traditional system was inapplicable to the organization of an expanded range of sonic material. It was unable to accommodate the new sound resources available to *concrete music*. It could offer only the example of its validity. Experimentation in *concrete music* sought an alternate system.

Schaeffer's definition of musical experience had further implications. The subject-object-subject relationship also constituted a communication between composer and listener, a pattern of events that both participated in. Schaeffer outlines this very clearly.

> The dodecaphonists did not reveal any new expressive possibilities, but were instead involved in experimentation. . . Without a consensus about musical language or procedure, an expressive object cannot be constructed or perceived. A composer who is restricted by pre-conceived schemesis an artisan serving an aesthetic automatism. Similarly, a listener who references his impressions to the past, or experiences music intellectually rather than musically is a commentator on a text or diagram. *Musical language* no longer exists. There is no relationship between composer and listener through the intermediary agent the 'musical object'.[52]

All music must fulfill this double mandate of responding to an essential element of human nature, and thereby establishing a communication between the two subjects. Traditional music had achieved this;

concrete music, in this regard, had to emulate the traditional system.

> I would prefer that concrete music involved both the object and the subject, ergo the complete process. An objective zone would be circumscribed in music where the object, its perception and creation would be susceptible of analytical examination. In addition there would be an awareness of the two symmetrical relationships that trace the interplay between the object and the two subjects. In principle these active or passive relationships allow the object to be used to communicate, following the hypothesis of language. More simply and mysteriously, however, they connect the two subjects into communion with the same object.[53]

A traditional musical situation (with composer, intentional construction, and listener) circumscribes compositional practice. Moreover, it implicates Schaeffer's attitude to music, the perimeter of his experimentation is visible. Schaeffer's designs for the musical object were established early in his work with sound. Two considerations connected to environmental sound are seminal in this regard: musical elements must be separated from dramatic elements, and a differentiation must be made between naturally occuring sound and music. The latter implied a recognition of compositional intent. Compositions that used environmental material risked becoming dramatic sequences through reference to their contexts. They also might be heard as random sounds. Neither possibility conformed to Schaeffer's concept of the musical object.

The *Etude aux chemins de fer* (described in the first journal of *A la Recherche d'une Musique Concrète*) was pivotal in dealing with these issues. The identity of train sounds is difficult to mask. Schaeffer wrote that the *Etude aux chemins de fer* precariously paused between identity as a dramatic or a musical sequence. In describing these attributes, Schaeffer simultaneously reveals a formative idea about the nature of music.

> A dramatic sequence constrains the imagination. Events are witnessed: departures, arrivals. These are reconstructed visually. The engine moves; the track is deserted or crossed. The machine sighs, relaxes -- anthropomorphism. This is all contrary to music. However, I succeed in isolating a rhythm then alternating it with a different sound *colour*. Dark clear dark clear. This rhythm might remain unchanged for a long period of time. It then becomes individuated and its repetition causes the sound source (train) to be forgotten.
>
> Is this a musical sequence? If I extract a random sound element, and repeat it without concern for its *form* but vary its *material*, I eradicate this form. Only the variation of material emerges, and with it the musical phenomenon.[54]

This specifies one of the attributes that must be present in a sonic construction in order that it be considered musical. Music is an assemblage of sound elements from which causal references are prescinded -- a play of sound material in an abstract construction. Schaeffer pursues this idea in very definitive terms:

> ** All sound phenomenon can be considered (as can all language) for its referential signification, or for its material substance. If signification predominates and is explored, literature and not music results.[55]

The solution to this quandary also establishes compositional intent. The avoidance of signification involves the isolation and repetition of the sound object. The causal source is obliviated and through repetition, the composition is perceived to be intentional. Schaeffer constructed a descriptive score for *Etude aux chemins de fer* in which letters indicated different sounds. Each sound segment was repeated, for this action precisely demonstrated that the composition was not haphazardly listed from naturally occuring sound phenomena.

> ** A series (i.e., of sound fragments) a,b,c,d,e,f,g, would probably be without expressive characteristics. For in the last analysis, nature can provide us with such a sequence in which no creative power can be discerned... If I compose a sequence in which I double each of the fragments, aa,bb,cc,dd, a will is immediately apparent

> that cannot in any way be confused with chance. *Nature never repeats the same thing.* . . . I could then follow the repeated sequence with a series of single events, for this subsequent succession of events would gain the character of intentional composition by association with the preceeding sequence.[56]

This concern for intentionality reoccurred in *A la Recherche d'une Musique Concrète*. Here, however, its implications weighed on the subjects rather than the musical object. At the end of the first journal, Schaeffer records a conversation that took place after a public concert of *concrete music*. Schaeffer was asked if the sound of waves constituted music. He replied affirmatively.

> Although the action did not involve making an object, the listener created the work by abstracting the sound from its chaotic context and subjectively giving it a form. . . The concrete experience in music consists in constructing sound objects from time segments broken from the cosmos rather than through an interplay of numbers and metronomic seconds. If music exists in the sound of waves, it is because the listener intentionally applies a conscious order onto exterior chaos.
>
> In order for music to exist it suffices that there be a relationship between the subject and the sound object. The initial musical act must contain the mode of intentionality in the act of hearing. A fragment must be chosen from the total fabric of sound. The memory plays the role of the closed recording groove; it retains a sound, records it and repeats it. The whole content of the sound (form and matter) must be examined. It can be repeated, imitated, combined with other sounds.
>
> The listening subject would thus create music out of continually unfolding chaos... He would impose on the universe a form born within himself.[57]

The ramifications of relegating the entire musical process to the listener are extensive. Schaeffer only momentarily subscribed to this idea and it is not present in any of his studies. It was an idea that was latent in his area of sound construction; in the early fifties, it was in the 'compositional winds' as an answer to the question of musical experience.

Schaeffer, in fact, immediately qualifies his statement by noting

that the choice of water movement was fortuitous. The sound was periodic. In what he termed "pure chaos" -- presumably non-periodic sound -- music would not be perceived. "The noise of the waves is not chaos; there is pulsating rhythm, and each of the waves is a variation on an unchanging theme."[58]

This uneasiness with listener-made music underscores Schaeffer's pre-existing compositional premises. He hesitated before anything that hinted at found art, that blurred the edges between art and life. Moreover, his musical attitude, in this instance, influences musical structure. He uses information theory to explain the presence of music in environmental sound.

> . . . I am able to provide a key to the enigma through information theory. If there is a chance at all that the noise of waves is musical, it is because the sound is redundant. This is an aspect of music and all messages.[59]

Music, therefore, must be consciously constructed on the premise of repetition and the transmission of information.

Schaeffer's dismissal of listener-made music became a conscious part of his ideology. This is evident in *La Musique Ecartelée* in which Schaeffer affirms his formative thought. Retrospectively, these defining premises of *concrete music* are clarified.

Schaeffer's argument in *La Musique Ecartelée* rests on a description of musical listening. A sound is heard and immediately connected to its source. Instrumentation, subtleties of performance, and expression are perceived. Finally, the musical ideas are acknowledged, revealing the musical system which is at the root of the process. The subject-object-subject relationship, described in *L'Experience Concrète en Musique*, is a

pre-requisite for the procedure to function. All aspects of the previously defined musical experience are present in *La Musique Ecartelée:* the composer, the listener, and the musical object. The composition of the object, moreover, must be based on a system that reflects an authentic relationship between subject and object.

La Musique Ecartelée is replete with echoes of *L'Experience Concrète en Musique*. Music as a communication process is implied in a discussion of the misunderstanding inherent in contemporary music.

> In the stabilized world of western music in the eighteenth century it was possible to speak of schools and aesthetics. But in order to compare (classicism and baroque, impressionism and romanticism) we need a common language. We no longer have one and there is no stability; aesthetic differentiations which yesterday appeared to be important have today disappeared into a paradoxical uniformity, that of cacaphony.
>
> "Cacaphony" is the Greek substitute for the word 'misunderstood'. And in this context, both stand for an epistemological blockage between composer and listener.[60]

In *L'Experience Concrète en Musique*, experimentation is a search for an 'authentic' basis for music. This is repeated in *La Musique Ecartelée* with the statement that "a discovery (i.e., in music) leads not so much into the intellect, a relatively well mapped domain, but into the inner realities of man. It is a more profound realization which can be known only in a collective manifestation." This idea, moreover, indicates music's higher function; the golden chalice of Schaeffer's ideology is revealed.

> Time must pass before new sound structures can be elaborated and tested against the natural laws of sound and the consensus of society. It is apparent that composition is not so much a question of communication between individuals but an occult correspondence between man and the cosmos, at once private and universal.[61]

It is evident that Schaeffer's experimentation in *concrete music* was

directed by a particular conception of music and musical experience. Further, this conception continued even after Schaeffer's practice had changed. Its flaw lies in its pretense of prescribing musical reality. The exclusivity of Schaeffer's premises is visible when viewed within the range of contemporary music. In *La Musique Ecartelée,* for example, specific examples of lestener-created music are refuted. The situation is described as the "supreme illusion of having all music occur within the listener. Given any transitory sound, or a musical cliché, the listener would create his own music."[62] Without the composer, and a musical *object,* however, the experience is deemed incomplete. Schaeffer called this 'subjective' music; John Cage, Luc Ferrari, and Steve Reich were categorized under this heading.

> Opposed to (the determinism of formulae sought outside the realm of music.) was the subjectivity held by Cage and those who directly or indirectly became disciples of Cage. Music as diametrically opposed or coming from attitudes as different as those of Luc Ferrari and Steve Reich can be assembled under this banner. Luc Ferrari taped the ambience of a farm and demanded that it be heard as music. Reich's music appeared to be completely different since it reused motifs culled from traditional music. In both cases, however, it was within the listening subject that the musical phenomenon reputedly occurred. Whether by active listening and a recreative imagination or through the passive impregnation of a musical opiate, the premise and the result were the same.[63]

Schaeffer himself had encountered a situation that questioned his subject-object-subject paradigm in the wave sounds discussed in the first journal of *A La Recherche d'une Musique Concrète.* He relegated this idea to a partial aspect of the total musical experience, rather than allowing it individuation. Schaeffer's compositional premises and his conception of music cannot be applied ubiquitously to all music, as was done in *La Musique Ecartelée.* An investigation of Schaeffer's own examples (Cage, Reich, and Ferrari) will position Schaeffer's musical ideas within a wider context.

In 1952, the year *L'Experience Concrète En Musique* was written, John Cage performed his *Julliard Lecture* at the Juillard School of Music in New York City. David Tudor, Morton Feldman and Henry Cowell were also in attendance. Cage read the four part lecture from a text graphically positioned on the page so as to facilitate rhythm and silences. Throughout the reading, Tudor performed pieces by Cage, Feldman, and Christian Wolff. The sphere of music as Cage presented it was dramatically at variance with Schaeffer. (see figure 1)

In 1957, in an address to the Music Teachers National Association, concerning experimental music, Cage described his now legendary experience in an anechoic chamber where he first encountered the sounds of his nervous system and blood circulation.

> . . . Until I die there will be sounds. And they will continue after my death. One need not fear about the future of music.
>
> But this fearlessness only follows if, at the parting of ways, where it is realized that sounds occur whether intended or not, one turns in the direction of those he does not intend. This turning is psychological and seems at first to be a giving up of everything that belongs to humanity -- for a musician, the giving up of music. This psychological turning leads to the world of nature, where, gradually or suddenly, one sees that humanity and nature are not separate, are in this world together; that nothing was lost when everything was given away. In fact everything is gained. In musical terms, any sounds may occur in any combination and in any continuity.[64]

Cage also experienced the expansion of materials and the obsolescence of traditional values, but not as a negative state or as a void to be filled. A self-proclaimed anarchist[65] Cage was comfortable outside of authoritative structures. The subject-object-subject paradigm of musical experience counters his music and thought, its application is inappropriate.

A man is a man and a sound is a sound.
To realize this , one has to put a stop to studying music
. That is to say, one has to thinking that
separates music from living stop all the There is all the
time in the world for . , but
for living there is scarcely studying music .
any time at all

... I remember now that Feldman spoke
of shadows. He said that the sounds were not sounds but shadows.

They are obviously sounds; that's why they are shadows; every something
is an echo of nothing. Life goes on very much like a piece by Morton Feldman
. Someone may object that the sounds that happened were
not interesting. Let him. Next time he hears the piece

Figure 1. John Cage, from the "Julliard Lecture" in *A Year From Monday*. Wesleyan University Press, 1967.

Reich did create a musical system that directed his composition. His premises are posited as personal preferences and are doctrinal to the extent that they determined the music in which he himself participated. Reich's music of gradual process is a composed music from which all improvisation is excluded; the sounds change slowly enough that all changes are perceptible. Reich does not endeavour to create the "musical object" that Schaeffer prescribed but rather a processional experience.

> Though I may have the pleasure of discovering musical processes and composing the musical material to run through them, once the process is set up and loaded it runs by itself.[66]

Although the pieces are totally composed, they are not totally predictable.

> The use of hidden structural devices in music never appealed to me. Even when all the cards are on the table and everyone hears what is gradually happening in a musical process, there are still enough mysteries to satisfy all. These mysteries are the impersonal, unintended psycho-acoustic by-products of the intended process. These might include sub-melodies heard within repeated melodic patterns, stereophonic effects due to listener location, slight irregularities in performance, harmonics, difference tones, etc.[67]

Moreover, the performing experience is integral to the music and certainly as important as the listening experience in the choice of compositional mode.

> This music is not the expression of the momentary state of mind of the performers while playing. Rather the momentary state of mind of the performers while playing is largely determined by the ongoing composed slowly changing music.
>
> 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. This is what I ask of my own compositions, those of another composer, and this is what I looked for and found when I studied Balinese and African 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 part of it.[68]

Luc Ferrari's work also was at variance with Schaeffer's doctrinal description of music. Ferrari was, until 1963, a member of the *Groupe de Recherches Musicales*. After 1963, he developed what he called "anecdotal music" which involved the taping of environmental sounds, purposefully retaining their causal references. Ferrari concurred with Schaeffer that an 'aesthetic object' had no meaning to the contemporary mass audience, but responded by retaining the dramatic element of environmental sound. His pieces became an interplay of associations. This was the 'dramatic' option that Schaeffer encountered in the *Etude aux chemins de fer* that had proved impossible under his musical directive.

In Ferrari's first anecdotal piece, *Heterozygote*, 1964, he admits wanting "to forge a language existing on a dramatic as well as a musical plane."[69] A juxtaposition of sonic images, *Heterozygote* was, (as Schaeffer described in *La Musique Ecartelée*) open to the creative imagination of the listener. Ferrari called it a "poor man's concrete music".

A later composition, *Presque Rien #1, Lever du Jour au Bord de la Mer* (1970), veers towards 'sonic photography' -- 'phonography'.

> *Presque Rien #1* is an undistorted portrayal, although in fast motion of daybreak on the beach: it is electro-acoustic natural photography, in which Cage's respect for reality is crossed with a dream of a sounding *minimal art*. If it should occur to anyone that this were no longer "art", he would be entitled to his opinion, and Ferrari would be happy.[70]

Once again, Schaeffer's paradigm is inappropriate to the artistic situation. From a perspective in which *concrete music* is one idea among many, Schaeffer's arguments that attempt to invalidate the works appear tautological. He simply establishes with some intricacy what precipitated the comparison -- that these works differed from his own.

If Schaeffer's premise -- that all contemporary composition is experimentation -- is adhered to, then the works of Cage, Reich and Ferrari were experiments of a totally different order. Schaeffer's experimentation followed a pre-established definition of musical experience. The works of these composers explored the nature of musical experience.

It is evident from Schaeffer's writings that the experimental method was not open-ended research but the active arm of the aggregate of his beliefs. When Schaeffer entered the musical field in 1948 there was a reciprocating relationship between his formative ideology and empirical experience. The direction of his experimentation, however, was already embryonically present. Schaeffer from the outset, for example, wanted to make pieces. This objective did not change even after he decided that this was an inappropriate aspiration and chose to call his work "experimentation" rather than "composition". Further, his compositional format involved the organization of sounds extracted from their causal source, as well as the maintenance of the subject-object-subject paradigm of musical experience.

By 1952, in *L'Experience Concrète en Musique* Schaeffer had formulated an ideology; most of the essay's analysis is directed towards its illumination. In a period of four years, Schaeffer had constructed the scaffolding for a new music: a clear idea of the ultimate nature of music, a directive-cum-justification for experimentation, and an empirical methodology. There is a resounding finality in Schaeffer's writings; they do not just describe a particular situation or the making of musical object. They are concerned with an unequivocal conception of a universal activity: Music. Schaeffer presents a first cause argument that is

unassailable. Any sound construction that counters its premises cannot be music. Moreover, the assertion of the definition of Music forms the argument of *La Musique Ecartelée*, a quarter century later.

Schaeffer's attitude can be seen as open and innovative in its empirical approach to material, yet restrictive in its ideology. This ideology, however, can be explained by the socio-historical situation that characterized music making in the early fifties; other composers besides Schaeffer self-consciously sought to define music and provide a framework for their compositions. The exclusivity of Schaeffer's answers to the questions about Music can only be considered negatively when they become prescriptive. In themselves, they simply describe Schaeffer's work.

FOOTNOTES

[1]To nineteenth and twentieth century French poets, music was an ideal poetry. They considered it an art of pure sound, unencumbered by rhetoric or representation. References to this idea can be found in Baudelaire, Verlaine, and Malarme. (cf. Martin Cooper, "Verlaine's 'Art Poetique'," *Ideas and Music* (London, 1965): 11.

[2]Pierre Schaeffer, *A la Recherche d'une Musique Concrète* (Paris, 1952): 11. Hereafter, referred to as *A la Recherche*.

[3]*Ibid.*

[4]Pierre Schaeffer, "Introduction à la Musique Concrète," *Polyphonie*, 6 (1950): 30. During this period, Schaeffer wrote six pieces: the five indicated studies plus a second piano etude. (The two piano studies were titled *Etude violette* and *Etude noire*.) Lowell Cross, in his article, "Electronic Music, 1948-1953," lists the *Concert de Bruit* as:

Etude aux chemins de fer;
Etude aux tourniquets;
Etude au piano I (Etude violette);
Etude au piano II (Etude noire);
Etude aux casseroles (Etude pathétique).

Schaeffer's list is more probable as Cross's list derives from a secondary source. The *Etude au piano* was probably the second piano study, *Etude noire*. This study appeared under the title *Etude au piano* on the first recording of concrete music. Schaeffer's article (*Polyphonie*, 6: 1950) was reprinted and annotated (*La Revue Musicale*, 303-304-305: 1977). His list of the contents of the *Concert de Bruits* was unchanged.

[5]Pierre Schaeffer, *A la Recherche*: 25.

[6]*Ibid*, 26.

[7]*Ibid*, 28.

[8]*Ibid*, 26.

[9]*Ibid*.

[10]*Ibid*, 22.

[11]*Ibid*.

[12]Pierre Schaeffer, "La Musique Concrète:" *La Vie Musicale* (July-August, 1951): 8.

[13]Lowell Cross ("Electronic Music," *Perspectives of New Music* (Fall, 1968): 44.) aptly notes that a composition of concrete music over twenty minutes long would convey a feeling of extended duration.

[14]Lowell Cross, "Electronic Music," *Perspectives of New Music* (Fall, 1968): 44.

[15]Pierre Schaeffer, "Sound and the Century: A Socio-aesthetic Treatise," translation with introduction by Donna Zapf, *Vanguard*, vol. 9,1 (February, 1980): 6.

[16]Jon Appleton in his article, "Aesthetic Direction in Electronic Music," *Western Humanities Review*, vol. 18,4 (Autumn, 1964): 345, employs this terminology with referral to Leonard B. Meyer. Appleton states that "(Meyer) demonstrates that the fundamental character of music prior to the avant garde was 'teleological', viz. orientation towards a goal." Appleton labels German electronic music in Cologne as non-teleological. Many complications would arise from a wholesale application of this terminology to contemporary music. It is, however, applicable to Schaeffer's endeavour.

[17]*The Compact Edition of the Oxford English Dictionary* (Oxford University Press, 1971): 504.

[18]Paul Robert, *Dictionnaire Alphabetique & Analogique de la Langue Francaise* (Paris, 1970): 322.

[19]*The Oxford English Dictionary:* 504.

[20]André Boucourechliev, *"Musique Concrète," Harvard Dictionary of Music*, 2nd ed., ed. Willi Appel (Cambridge, Mass., 1972): 560.

[21]Pierre Schaeffer, "Musique Concrète," *Encyclopédie de la Musique*, published under the direction of Francois Michel in collaboration with François Lesure and Vladimir Fedorov (Paris: Fasquelle, 1958-61): 570.

[22]Boucourechliev, 561.

[23]Conversation with Hildegard Westerkaamp, composer with the World Soundscape Project. (June 18, 1980).

[24]see Luigi Russolo, *The Art of Noise* (Milan, March 11, 1913); *The Futurist Intonarumori* (May 22, 1913); *Enharmonic notation for the Futurist Intonarumori* (March 1, 1914) published in translation in Michael Kirby, *Futurist Performance* (New York, 1971).

[25]The harshest criticism came from Maurice Lemaitre in his introduction to a French translation of Luigi Russolo's *Art of Noise* (Paris: Richard-Masse, 1954). Schaeffer's disavowal of the futurists (A la Recherche d'une Musique Concrete: 31) was termed by Lemaitre "cultural assassination". Schaeffer is also mentioned, however, by Michael Kirby in *Futurist Performance:* 40 and by John C.G. Waterhouse in his article "A Futurist Mystery," *Music and Musicians* (April, 1967): 26.

[26]see Michael Kirby, "Russolo and the Art of Noise," *Futurist Performance;* and John C.G. Waterhouse, "A Futurist Mystery."

[27]these pieces appear in translation in Michael Kirby, *Futurist Performance.*

[28]Pierre Schaeffer, "L'Experience Concrète en Musique," *A la Recherche d'une Musique Concrète* (Paris; Editions du Seuil, 1952): translated below: 60. Hereafter, referred to as *L'Experience Concrète.*

[29]*Ibid,* translated below: 59.

[30]*Ibid,* translated below: 59.

[31]*Ibid,* translated below: 57.

[32]*A la Recherche:* 16.

[33]*Ibid,* 48-53.

[34]*Ibid,* 50.

[35]*Ibid,* 51

[36]*Ibid,* 35.

[37]Pierre Schaeffer, *Solfège de l'Objet Sonore* (Trois microsillons d'examples sonores illustrant le *Traité des Objets Musicaux* (Paris: Ed. ORTF and Ed. du Seuil).

[38]*L'Experience Concrète:* translation below: 76.

[39]Pierre Boulez, " 'At the End of Fruitful Land...'," *die Reihe,* vol. 1 (Vienna, 1955; English edition: Theodore Presser Co., Pennsylvania, 1958): 21.

[40]*L'Experience Concrète;* translated below: 76.

[41]*Ibid,* 77.

[42]*Ibid,* 55.

[43]*Ibid,* 58.

[44]*Ibid,* chapter IV: "From the Subject to Language."

[45]*Ibid,* 112.

[46]*Ibid,* 55.

[47]Herbert Eimert, "What is Electronic Music?," *die Reihe,* vol. 1 (Pennsylvania, 1958): 1.

[48]*L'Experience Concrète:* translated below: 57.

[49]*Ibid,* 86.

[50]*Ibid,* 58.

[51]*Ibid.*

[52]*Ibid,* 73.

[53]*Ibid,* 101.

[54]*A La Recherche*: 20.

[55]*Ibid,* 21.

[56]*Ibid,* 34.

[57]*Ibid,* 75.

[58]*Ibid,* 76.

[59]*Ibid.*

[60]Pierre Schaeffer, "La Musique Ecartelée," published as "Sound and the Century," trans. Donna Zapf, *Vanguard*, vol. 9,1 (February, 1980): 6. Hereafter, *La Musique Ecartelée*, translated below, 155.

[61]*Ibid*, 156.

[62]*Ibid*, 143.

[63]*Ibid*, 142.

[64]John Cage, "Experimental Music," *Silence* (Wesleyan University Press, 1961): 8.

[65]"Hearing my thoughts he asked: Are you a Marxist? Answer: I'm an anarchist, same as you are when you're telephoning, turning on/off the lights, drinking water." "Diary: How to Improve the World (You Will Only Make Matters Worse) Continued 1966," *A Year From Monday* (Wesleyan University Press, 1967): 53.

[66]Steve Reich, *Writings About Music* (Halifax Nova Scotia: The Press of the Nova Scotia College of Art and Design, 1974): 9.

[67]*Ibid*, 10.

[68]*Ibid*, 44.

[69]Luc Ferrari, Notes to the recording: *heterozygote*, Philips 836.885.

[70]Hansjorg Pauli, Notes to the phonograph recording:*Presque Rien #1*, Deutsche Grammophon 2543 004.

L'EXPERIENCE CONCRETE EN MUSIQUE

I. The Development of the Concrete Aspect of Music

Debussy made the following observation early in the century: "Although I admire *Petrouchka*, the *Sacre de Printemps* disturbs me. It would seem that Stravinsky is attempting to make music from non-musical elements, just as during the 'great war', the Germans made beefsteak from sawdust. The African drum cannot be considered musical material."

Ernest Ansermet continued these sentiments in a statement which he made at a remarkable conference in Geneva in 1948[1]; I will refer to this statement extensively.

"It is impossible to determine from his behavior if the composer still knows how or what to create, or even why he is creating. The creative imperative, no longer present, must be continually fabricated. During the inter-war years, composers assumed procedural hypotheses, seeking music outside of its realm, their search exacerbated by a sense of lost time. Less concern was directed towards composition than to new methods, new techniques, or new objects. This resulted in a rapid succession of absurd and bizarre forms, fashionable rather than aesthetically directed, that disconcerted the public.

When art loses its motive, dogmatism and formalism are substituted for creative purpose. This is demonstrated by current aesthetics, and is similarly present in the works of Stravinsky and Schoenberg, the most striking musical activities of recent times."

Since it is unlikely that Ansermet had heard of concrete music, it is interesting to find, in his lucid analysis, premises that agree with my own. Clearly, concrete music appears on the horizon as a 'new procedure' applied to a 'new object'. I, on the other hand, with no

pretense about creating a piece of music or asserting a new procedure, have undertaken technical-aesthetic experimentation. My confidence in the potential and validity of this method has wavered only because of my conditioning in traditional music; I felt ill at ease in the midst of uncertainty.

Moreover, I cannot conclude that the interest in my work has been generated by providence, the public or the work itself. I, with Ansermet see only uncertainty, undiscerning acceptance, and a paucity of reliable criticism. Concrete music could very well become fashionable, following the caprice of public taste, but at the moment, demands such as these are irrelevant.

On the contrary, concrete music is more intimately connected to what Ansermet aptly characterized as "the most striking musical activities of recent times". It has burst forth between the opposite referential frames defined by Schoenberg and Stravinsky. But if it finds correspondences in each, it does not reconcile them. Rather, it widens the gulf between them by revealing what each portends for the future, as well as what they bear of the past.

I have no desire to appear authoritative or to pretend musical expertise and have approached this commentary in the experimental spirit of the new musical method which I developed. I have no theory or musical system to present. I am guilty, rather, of breaking into a new attic in an old house. It remains to be seen if the new space will be inhabitable for any length of time. My conclusions, however, have at least been verified through real work presented in my journals[2], and not through dogmatic argument. In fact, the journals would have been sufficient had

I not wished to communicate some personal reflections. My thankless task would not be complete if I obscured the reality of the enormous loss of time, the confusion and misunderstandings inherent in the complex musical problem facing contemporary composers.

Certainly, if a "concrete" school exists, the word "concrete" must be taken as a broad appellation that is both provisional and incomplete. The concrete aspect of concrete music is evident to the point where it demonstrates the need for abstract methodology. If concrete music meant only the "concretization" of music, it would only continue an historical evolution in which composers and instrument builders, (the makers of viols and keyboards, wave generators and trautoniums) rival each other's ingenuity. It would be nothing more than new instruments substantiating conventional procedures. (German electronic music is a case in point.)

As soon as the concept of concrete music arose, however, it was exceeded not only by an abundance of new materials but by an explosion of formal possibilities. But unlike the new instrument makers, concrete music is not seduced by this proliferation. Instead, it demands an enumeration of these haphazardly liberated objects, an inevitability in their use, and a methodology, even if founded only on hypotheses.

Thus, concrete music is not a solution to music's immediate problems; nor can it be superficially connected to the music of Schoenberg or Stravinsky. It is no longer possible to compare the musical concerns of our predecessors with our own. They are like two approaches to geometry, one harbouring an additional dimension. New propositions broke the deadlock of classical geometry, invalidating old ideas while remaining on

known territory. Obviously, an exploration of the concept of melody must refer to melody itself, just as a consideration of instrumentation must involve the orchestra. It is important to maintain an awareness of the continued validity as well as the obsolescence of traditional music.

Referring again to Ansermet's cogent statement, occidental music is defined by the function of the dominant. Further, every tempered or non-tempered scale (as defined by Zarlino, Pythagoras, or Bach) is based on some approximation of the fifth and octave, intervals described by the simplest ratios (2/1 and 3/2). It follows that "all melody is a *path* which uses or avoids the fifth. Since the dominant determines the key, it is implicit in all melodic motion, and continually reiterated."

Ansermet has shed light on an aspect of traditional music that most musicians have never considered. He points out a correspondence between the musical object and the subject, which provokes an authentic interior resonance at the depths of human sensibility. The mystery of music is contained in an affective correspondence between human sensibility and a ratio representing a relationship of frequencies. Musical gratification or beauty are peripheral considerations in comparison with this inner connection to the dominant. "Melody is significative only when experienced causally. It is then heard by the listener as a trajectory whose outcome is internalized; the *path* is affective as an internal event."

This is an explicit way of applying ethics to music. When the dominant is present, the degrees of scales can be qualified. But apart from the dominant function there is no security. This interior experience must be replaced by a new communication through another medium than pitch. It will be found in a continually present although secret relationship between man and the cosmos. Sartre has called this "the metaphysical tenor of the tangible."

It may be necessary at this portal, for the public to recollect the inscription on the door to Dante's Inferno. The only hope that must be abandoned, however, is that which would reinstate the emotional satisfaction that the dominant function provides. And the vertiginous journey to less comfortable heavens will require a new asceticism.

In order to clarify later discussion, I will define the development of the concrete aspect of music. A fixation on the contexture of sound rather than pure form is evident in the work of instrument makers seeking refinement, or the increasing importance placed on the orchestra. This tendency is apparent in Wagner's emphasis on the timbre of the horns rather than their melody. It continues in the significant experiments of Debussy and Ravel, and leads finally to Stravinsky, who, according to Ansermet dealt the first blow to "interiorly affective" music. Stravinsky's works took contemporary music beyond authenticity.

The opposite trend towards complication was characterized by the introduction of an increasingly subtle syntax. The same 'words', however, or at least the same signs signifying the same values, continued to be used. This is apparent when the forms of each period are seen as an expanding utilization first of consonance, then dissonance (although the terms "consonance" and "dissonance" are relative and serve only to confirm listening habits.) In this regard, Debussy's use of six-note scales is notable, as is other experimentation with scale systems such as Messiaen's scales of limited transposition and finally the dodecaphonic system.

Contemporary music is restricted by maintaining traditional methods of "making music". And this applies to abstract, formal considerations

as well as to the concrete aspects of music. The contribution of concrete development becomes apparent at this point.

The evolution of music will always be limited in its form and material by the use of traditional instruments and symbolism. Stravinsky's disciples would emphasize the fortuitous expansion of the material of music, and indeed there are many who are exploiting the sound possibilities of the traditional orchestra. Schoenberg's followers, on the other hand, pursue continually more abstract designs, using pitch relationships that ignore the traditional base of musical experience.

In order to convey my argument, however, I cannot acknowledge only Schoenberg's abstraction and Stravinsky's concretization. These tendencies can also be reversed.

The world of Stravinsky is, in fact, pre-occupied with abstraction, just as Schoenberg's is defined by ideas that intimate a concrete context. Stravinsky uses a meter that is dissociated from the melody in order to escape the mono-dimensionality of pitch. In this he approximates a rhythmic series in which variously structured measures, rather than single notes, succeed each other without repetition. And Schoenberg, in his harmonic treatise, speaks of future *Klangfarbenmelodie*, a timbral melody on a single pitch. Concrete music sheds light on Stravinsky's preoccupation with the abstract, and Schoenberg's with the concrete. They created new and autonomous possibilities for musical expression beyond the parameter of pitch.

Even though Stravinsky did not have the means to create cells as in concrete music, he approximated them with 'cellular' measures of notes

and rational rhythms. Schoenberg's *Klangfarbenmelodie*, a succession of different instrumental timbres repeated at the same pitch, would quite possibly be heard as a unison. These precursory ideas, however, might have reached fruition if new materials had been at the composers' disposal. Instead, Stravinsky's polymeters, and Schoenberg's timbral melody represent minor aspects of the composers' works -- experimentation without development. Stravinsky and Schoenberg are associated instead with polytonality and atonality.

A musical evolution ended. It is presumptuous to think that composers such as Bartok or Ravel will never again be accommodated. But it is equally presumptuous to think that there is nothing to be said or done in the world of sound. At present, even the most rebellious defectors from the traditional system still make use of the "material" which for centuries has served to express the dominant function. Even the most audacious transgressor cannot obliterate the past. Anything that deviates from the accustomed patterns of occidental music, whether six-note scales or systems of twelve notes, is not heard.

The addition of thirds, seconds, dominant sevenths did not herald a new music. It merely enlarged the language, or deviated from the accustomed practice of traditional music. And since the process is accretive, the listener develops with the composer. In every period, a new word or figure is assimilated into a perduring rhetoric that is recognizable and comprehensible. Debussy's six-note scale, for example, is heard only in reference to the traditional system maintained by cultural sensibility. Even Debussy himself would not hear his music as a newborn would, or a Hottentot suddenly initiated into this sound universe.

Similarly, the dodecaphonists erred in thinking that it was possible to construct an atonal series. Whoever hears their works will perceive the forbidden fruits of the traditional system, which doubtlessly some of the dodecaphonic composers secretly employed. Further, the most scrupulous of these composers are motivated by destruction. An unfortunate paradox confronts those disciples of Schoenberg who lack creative genius. They must employ conventional musical material yet completely disfigure it. The results might demonstrate a sublimated tonal intention that is fragmented and seemingly clandestine. Or else, the series might be so rigorously applied that the work cannot be experienced in the traditional ways. In the latter instance, the note plays a similar role as the letter in a *lettriste* poem[3]; the composition has become a construction of sound objects. Serial music in this instance is like a *lettriste* poem where all verbal or onomatopaeic suggestion has been eliminated. At this point, serialism is aligned with concrete music in separating itself completely from traditional musical discourse. Serial music, however, continues to use musical instruments and symbols; concrete music, from the outset, has been concerned with noise and plastic structure.

Musical sonority must be expanded to accommodate an extended roster of timbres. The evolution of timbres must gain expressive value, and pieces must be composed whose structures derive from other factors than the interplay of pitch. With Stravinsky, who can hypothetically be considered as sympathetic to concrete music, this appears as a chosen direction. However, it was inadvertent in the work of the dodecaphonists who were antipathetic to concrete music. (Although some were mysteriously attracted to it.)

Since the twelve note series cannot escape tonality, true atonality exists only in concrete music. But conversely no doctrine prevents concrete music from associating with tonality although my dodecaphonist colleagues (or dare I say disciples) rigorously exclude it from their work. It seems arbitrary and inhuman to forbid known elements from construction in which the results are as yet unforeseen. This is both snobbery and a very modern prejudice to which I do not subscribe.

Although I have failed in my attempts to construct concrete works that employ the traditional system, this does not mean that it is impossible. I hope that others will follow me in seeking a renewal of the traditional system and not just fill old flasks with new wine. Without denying or destroying the traditional system, this evolution will allow new sounds to co-exist with our present musical culture.

In spite of my estimation for Stravinsky and Schoenberg, I must agree with Ansermet's assessment of atonality and polytonality as decadent and inauthentic. The appearance of the word "tonality" indicates its presence, whether through excess or by default. The exciting impurity of Stravinsky's exploitation of cliche is piquant, just as serialism is specious and desolate. Yet these techniques have gained tacit support as well as vocal apologists who have no reasonable arguments.

I was pleased to discover in a recent issue of *Cahiers du Sud*[4], a compelling article on Arnold Schoenberg written by Luc-André Marcel (who is probably not cognisant of concrete music). I would like to incorporate part of it as an outline of the "development of the concrete in music" even though the perspective is somewhat cerebral. According to Marcel, it illustrates Schoenberg's temptation and ultimate downfall.

"Absolute sound can be nothing other than a universe containing all sounds. It is a surface or sphere where silence does not interrupt the perfect relationships between notes. No sound can succeed any other, as everything is prolonged to infinity. Limitless and without height or depth, it is perhaps best characterized as a circle, a single sound, or a silence. Music is a precarious meditation on this absolute but inaudible sound, an accidental or arbitrary division of unity to form diverse scales. A single silence introduced into this all-inclusive field of sound changes everything. Differences are perceived that permit successive organizations. Music is then an art of organizing silences, annulling sound spaces in order that others might arise, and drawing the connective lines between them.

Schoenberg, I imagine, must have dreamt of this absolute, but to attain it had only the primitive possibilities of available sounds. In order to be heard, he was forced to submit to the technical limitations of instruments, utilizing the tempered occidental scale. More than anyone he sensed the inherent imperfection and poverty. He was aware of the abyss between an *f* and an *f#*, but before composing microtonally, it was necessary to establish dodecaphony. Perhaps he thought that others would establish a more subtle scale when ears and instruments became more refined."

II The Experimental Method

I have quoted Luc-André Marcel because his prescience of another music is expressed in intangible as well as tangible terms. Once art or civilization becomes decadent, it is difficult to describe the circumstances or speculate on renewal. Rarely is the pre-figuration of a new art object, or the style of a new civilization prophesied. Marcel perspicaciously describes how Schoenberg's system defaulted through arbitrary limitations and internal contradiction. He also indicates that the impasse can be over-reached through a renewal of what he calls physical sound. He ceases to be prophetic, however, when he gives in to his own musical enculturation; he opts for an increased refinement of the instrumental means of producing sounds, parallelled by increased ability to perceive sound.

My experience in concrete music contradicts this projection. The scales, apparatus and even the appreciation of concrete music might indeed be more subtle, but not in a predictable sense. On the contrary they might seem coarse or imperfect when compared to the old system. Regeneration occurs when the status quo is opposed. The result, however, breaks new ground. It completes nothing. Rather, it adds to the old system, or replaces it with a new mode of existence.

Centuries of historical continuity in music have not prepared us for the radical nature of certain changes, we are uncomfortable, even though change characterizes our epoch, as seen by contiguous revolutions in thought, politics and technology. But I would caution against the facile attitude that assumes the present epoch to be extraordinary. Instead, I advise the infatuated to consider eternal repetition. In cyclical

evolutions, the cycles, not the events are repeated. It is therefore important to know if one is *in medias res,* or at the decisive point in the process where everything will be renewed.

Musical evolution can illustrate this hypothesis. The *piano-forte* and equal temperament were incontestably at the beginning of a cycle. The orchestra loomed behind the piano, while the equal tempered system allowed harmony to be established and notated. In fact there has been no real revolution from Bach to the present. Beethoven, Wagner, Debussy, and Stravinsky did not reveal anything new, but rather explored the *terrae incognitae* of their own planet. Moreover these important figures were not alone, for individuals cannot exhaust a system, however innovative their contributions.

A scientist, not constrained by an artistic mandate of originality, can apply the discoveries of his predecessors without being accused of plagarism. This was true also for the Bach family. In the eighteenth century, artistic competition was less overbearing, and for most artists and their public, the only obligation of art was to please. In short, the contemporary composer is hounded by the same imperative that goads the contemporary scientist who would attain distinction. He must discover a new body of knowledge. The pedagogy of the academies, where composers are schooled as engineers and expected to apply only known and duly taught procedures, is therefore completely laughable. For the contemporary composer is expected to discover a music that is not only innovative to himself, but effects the objective domain of musical knowledge.

Writing is not parallel to music, in that the writer is not always directly concerned with language. The playwright, the novelist or the

philosopher use language to ends unconnected to its material and form. A writer might be indulged even if his work lacked style. Only poetry can truly be compared with music. For the past decades, poetry also has been consumed to the point of exhaustion, and poets have no audience unless they too are innovators.

This tangent is necessary to underline the unacknowledged position of today's composers. The young composer is like newly graduated mathematicians, who adhere to the Academy of Science in lieu of making real inroads in mathematical theory. They do not aspire to true mathematics but are infatuated with anyone who would present it to them. Schoenberg revealed a path and a methodology (Stravinsky can only serve as an example) and is therefore emulated even though the results are ungratifying. To the most courageous, music today appears as scientific research, not art. A naive willingness to embrace serialism is not unexpected. Serialist composers calculate intervallic and rhythmic proportions and in rare cases actually convey the result to an orchestra. They defend their calculations, moreover, with romantic sentimentality without ever suspecting that they can be appreciated only as experiment and not as purposeful design.

This paradox is such a tragi-comedy that I am cognizant of it only through personal acquaintance with some of these composers. It is impossible to communicate the irony of their undertakings without awakening a realization of the need in music for a new method research. This awareness is invaluable.

I do not wish to play devil's advocate to dodecaphony. A precise and dispassionate criticism can be found in Marcel's article on Schoenberg.

I am even less inclined to be critical, as dodecaphony can be seen as a preparation for the concrete method. Numerous problems posed by the concrete method were implicit in dodecaphony but in less radical form. It is imperative, however, to renounce the current musical language and its underlying sensibility. Moreover, a new attitude to the musical object must be cultivated that will extend beyond dodecaphony.

I agree with Luc-Andre Marcel in exposing the "pretention of Rene Leibowitz's students. From the intellectual heights of their grade-school texts, they judged Stravinsky, Bartok, de Falla and even Schoenberg as inadequate. For Schoenberg, dodecaphonic principles were justified as a means of transformation, and as research premised on empirical experimentation. It was only later that the investigations became categorical imperatives. The disciples sought miracles on demand."

It is anathema to me that the works of Leibowitz are akin to those of a musicologist who pursues detail regardless of theoretical foundation or practical value. How preferable if they were like the works of a modern mathematician preoccupied with functional formulae. An imperious attitude *vis-a-vis* dodecaphony has backed Leibowitz and his school into a corner. They extend nothing of the past and can no longer prefigure the future.

All of this would be different if the dodecaphonic system could again become experimental. If its base was scientific and open rather than authoritative, it might have evolved naturally to a positive conclusion. Still, the dodecaphonists would have to see their error. Instead of blindly asserting aesthetic value or posting theoretical justifications, they would have to develop those compositions which appeal instinctively

to a musical sensibility. And this selection must take place, even though the pieces probably will appeal despite and not because of the dodecaphonic system.

The bitter conflict between dodecaphony and concrete music stems from this variance in methodology. But concrete music is already divided into two schools of thought. One is empirical and depends on the discerning ear. The other, like serialism, arbitrarily applies preconceived schemes to concrete materials, expecting everything to result automatically[5]. Even though the second method appalls me, it is more justified in concrete music than in music intended for piano or orchestra. Concrete music, as yet unfettered by rules, is neither linked to the past nor uses sounds that allude to traditional musical material. Series formed with sound "objects", therefore, do not risk caricaturing traditional music or creating music that is unnatural. The processes and results of the schemes are analysed aurally. Moreover, since these studies must be heard through a loudspeaker, they avoid the confusion of the concert and escape the illusiveness of compositions requiring performance.

The conclusion is that the entrenched paths of the dodecaphonists are specious. They are obscured by the twelve-note scale and the precision of the keyboard. In order to expand from a series of twelve entities to one of thousands, (expanding from the tempered keyboard to the *phonogène*, for example) obsolete and false limitations must be forgotten. Another method must be adopted which at first appears scandalous because it is so approximate. This is also true in mathematics where approximation, far from producing fear, is the only real

approach to phenomena.

In concrete music, governed by the ear and an undefineable instinct, designs like those of Stravinsky, iambic studies or groupings of empirically chosen sounds, are all possible. If I had at my disposal an infinity of sounds whose pitch, timbre, rhythmic structure, width and depth could be varied at will, a linear arrangement as in dodecaphony would be inadequate. The twelve-note system is simultaneously too complex and too simple. It would be more efficacious to sample the sounds and then find the associations between them. Those effects especially should be cultivated that would facilitate the comprehension of these foreign experiences. / Repetition, for example, which marks the progression like stones on a path, is present in all primitive musics. ** It should be used in concrete music, rather than excluded for no reason other than it was forbidden by Schoenberg. Schoenberg banished repetition from his work in order to defeat tonality. I would prescribe it in order to recover music. /

In Stravinsky's orchestral compositions, melodies are often sketched, or ensembles suggested that are more like trajectories or designs, more concerned with architecture and colours than with harmony, themes or counterpoint. Stravinsky should be emulated in this. And ultimately he will be surpassed through the application of plastic means of construction unavailable to him.

We are anticipating ourselves, but this is inevitable when the narration cannot begin at the beginning. Composers and listeners are too quick to espouse concrete sounds, seeking in them the resurrection of old habits of thought, technique and expression. If musicians wish

to pursue concrete music, they must abandon the residue of their past behavior. They must turn a new leaf, and above all avoid inapplicable scientific methods. The indiscriminate worship of science is another and more serious pitfall.

When first encountering concrete sounds, musicians are initially frustrated in their efforts to make them conform to any system. Frequently, they appeal to technical apparatus to measure sound in all its parameters (pitch, timbre, amplitude, etc.), making exacting demands on the sound engineer. The engineer, however, responds out of his own studio experience. For example, he behaves more like a musician than a technician when transmitting a broadcast. He looks at the modulameter in order to 'frame' a crescendo; he manipulates the potentionmeter with the facility of an instrumentalist, using his ears and the resources of his instrument. The complex charts of the serialists mean nothing to him. It would be better if musicians expected the engineer's apparatus to be used aurally. The engineer would then expect experimental tests for musical-acoustic or psycho-acoustic study.

A sphinx guards the entrance to every human endeavor; the composer must proceed with care. Whoever would make music must use the ear, whatever the concomitant difficulty. Whoever would experiment with numbers and equipment must use physics and experimental psychology whatever the intention. This work must not be in vain.

It is possible to experiment with the apparatus of concrete music, which in effect renews the means of making music. Sound can also be classed and analysed for their material formal, semantic and psychological content. Art is made when the technical means concur with the

aesthetic results. Science and technology are beneficial if they facilitate an art that acknowledges both subject and object. Art is a relationship between subject and object and the exercise of this relationship is its practice.

III The Musical Object

The contemporary composer who chooses to deal with Music concretely veers from the deadlock described in the last chapter. His creation is without precedent. He writes as no-one before has written, and therefore with a style that is unquestionably original. Throughout, his directive is discovery, not the creation of expressive compositions.

/The dodecaphonists did not reveal new expressive possibilities, but were instead involved in experimentation./ I will continue to maintain this despite objections. Without a consensus about musical language or procedure, an expressive object cannot be constructed or perceived. /A composer who is restricted by preconceived schemes is an artisan serving an aesthetic automatism./ Similarly, a listener who references his impressions to the past, or experiences music intellectually rather than musically is a commentator on a text or diagram. *Musical language* no longer exists. There is no relationship between composer and listener through the intermediary agent, the "musical object".

The concept of the musical object has no traditional basis. Moreover, even to pronounce this term in the music world arouses controversy and misunderstanding. The innovative importance of the musical object, however, is its provision for the objective study of music.

As long as musical theory involves only solfege, harmony, composition, or analysis it excludes the musical object. Musical construction in this closed universe is concerned with notation, formal structures, and results. The musical object cannot be discerned in the relationship between the twelve pitches, the composer and the listener. (It might be pointed out also, that the role of the performer in the process is minimal.)

The question arises as to whether music can exist as an entity independent of the composing and listening subjects. In fact, I put this query to musical experts at a recent conference, chaired by Roland Manual, in Aix-en-Provence. Music would have to exist in the form of a score or as a performance; its provenance would lie between the last moment of the compositional act and the instant that the listener perceived the music. Classical music theory cannot be expected to scientifically measure the musical object any more than it is expected to provide a phenomenology of this object in relation to the two subjects. It must be acknowledged that there is a deficiency, a *no-man's-land*[6] that no-one chances. It is not surprising that there has never been a true science of music since the object of the study has never been clear.

This also pertained to language. Semantics is a recent discipline whose undeniable value has been masked by phonetics*. In reality musical knowledge is a kind of phonetics consisting of artificial rules of a fabricated art. The study of musical structures has never been broached, except for the consideration of sonata, symphony, *et alia* grouped under the misnomer of "form". In truth, these "forms" describe a use of sound ensembles that has been dictated by conditioning. An inquiry into the symmetry of the melody cited in chapter XI (of *A La Recherche D'Une Musique Concrète*)[7] must employ *Gestaltheorie* (sic) not the rules of harmony. The theory of forms is preoccupied with the details of the preferred symmetry. The new method of inquiry, however, would explore the

---

*Semantics, however, has not endorsed the relationship between the word and the subject who uses it. An exception is *General Semantics* of A. Korzybski.

relationship between the musical object and the subjects who chose, composed, and in turn perceived and responded to it.

There are practical reasons for the misunderstanding that surrounds the concept of the sound object. Until recently, it appeared as a human event rather than an objective entity. It was bound to irreversibly unfolding time, evanescent and not recoverable. The object of a scientific investigation, on the contrary, must be repeatable, discernible in chaos, capable of being isolated, and able to maintain its identity under examination. Time, for example, music's milieu, is outside of the experimenter's jurisdiction because it cannot be repeated. In traditional music, therefore, the sound object can be investigated only as a score which dictates a performance, or as a memory of a performance. And the performance would be inextricably bound to the psychological complex of the concert. Traditional music obstructs objective investigation; it is limited, moreover, because its material is restricted to what can be notated or performed.

That is not all. The dissimulation of the musical object also maintains the separation of musical sounds and noise. Civilizations in a very human way have organized sound signals into assimilated or musical sounds, and noise. It is difficult to imagine or justify ending this age-old classification through the introduction of a sound object that cannot *a priori* be categorized. Transitional zones between musical sound and noise do exist in nature and in some primitive musical instruments. But instead of being objectively considered, these ambiguous areas have been exploited by poets, playwrights and even musicians for their expressive propensities. This facilitates the prejudiced

distinction between music and noise, especially since the term "sound effects" has gained such universal currency. The musical object has still not been revealed.

My journals illustrate two results of the new procedure. The instruments now at our disposal provide access to an infinity of sounds that are neither noise nor music in the traditional sense. They assume an integrity of their own, spanning the abyss between the explicitly musical and explicitly dramatic. These same instruments extract the sound entity from its ephemeral milieu, allowing it to be reproduced. Its identity is crystallized. This music exactly corresponds with its performance integrating design and realization, mind and matter. Thus, the record or tape irrefutably contains the "musical object".

Whether or not this seminal fact is accepted, it shakes the musical universe to its depths. The consequences are legion. Traditional music is limited to sounds that can be notated or performed. These are misrepresented as natural when in fact they are artificially derived. Formal archetypes are therefore employed as the only "musical" options. In mathematics, it would be the same if irrational numbers had never been introduced it was necessary to square a circle with algebraic numbers. Functions, theorems, systems and solutions, the whole of mathematics, would be stifled by the restriction. The introduction of imaginary numbers precipitated new mathematical constructions, yet they are conceptually far more absurd than is concrete sound in music. The concept of the "note complex"[8] opens the musical domain to a field far more vast than that circumscribed by the "pure note".

Because traditional music must be performed, its realization, like

its choice of structure, is limited. The roster of available instruments or the technical facilities of performers, however, do not cause the limitation. In fact, I would deem them to be adequate. The most perfidious and also the most seductive limitation is the mensurable beat to which musical ensembles conform. Music that is conducted bears the marks of simple muscular processes. To consider this as providentially human would be to misconstrue the ubiquitous aspiration to over-reach anthropomorphism and address meta-rational and universal structures. In this light, Debussy's comment about the African drum can be reversed and the contemporary orchestra judged a retrogressive battery in the atomic age. /

Science leads minds to conceive the inconceivable. It opens dimensions beyond those that our sense can perceive. In this instance, it demonstrates that the physical and metaphysical rhythms of the world cannot be measured with muscles or metronomes. If music aspires to the language of gods, more complex and therefore more objective construction must be investigated.

The meaning of music must be probed, as well as our expectations of it. Is it an *agrément*, or does it have a more austere purpose as a specific path to knowledge completing and complementing science? The answer cannot be reached in the context of my discussion. Music must first be considered in a generalized perspective that would connect it to other experiences and to the spiritual destiny of the epoch. Perhaps I will pursue this in future. For the moment, however, I will concentrate on the musical object in order to provide examples of its recognition, generation, and experimentation.

The sound of struck piano strings is chosen from infinite possibilities and recorded. This "sampling" (in the terminology of concrete music) implies a specific treatment which generates diverse objects. Numerous factors determine the sonority and "width" of the sound, as well as its approximation to musical sound or noise. Everything depends on the mode and speed of the attack, the pressure applied to the strings, the way that the sound is damped, and particularly the number of strings effected. This is far removed from the micro-tonal refinement prescribed by Marcel. It involves instead the movement of a block of sound called a "wide sound" which consists of several semi-tones. This sound would be used in a manner analogous to the so-called pure sound which has a single fixed pitch.

Different constructional possibilities are implied by the sound object. First, pseudo-melodies can be constructed. Available apparatus make it possible "to play" with this note, altering its tessitura, making rhythms, etc. (See figure 1) But there are less banal options. A family of objects can be derived from the progenitive sound through the interjection of formal considerations. The intensity or clarity of the attacks can be changed, the internal rhythm can be augmented, or the extremes of the sound can be accented. (See figure 1) A sort of *anti-melody* results. The original sound of the piano is like a theme from which a suite of variations proceeds.

The first organizational possibility is akin to a traditional ordering of sound. The second is a plastic alignment which arranges sound through changing affinities. A compromise exists, however, that is neither so musical, ergo traditional nor an unpredictable, anti-musical

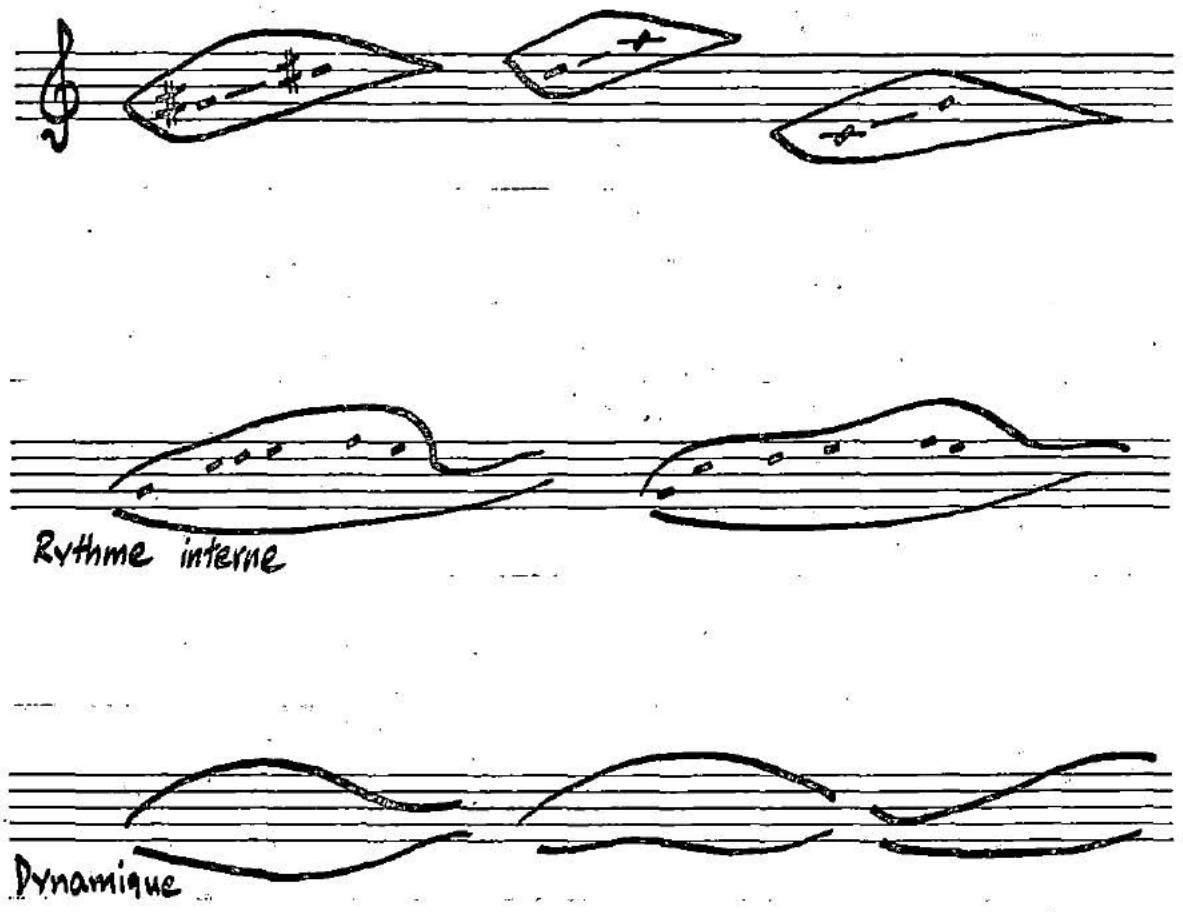


Figure 1.

process which architecturally aligns objects according to intrinsic relationships.

This third option can be realized when other parameters besides pitch become prevalent. A succession of the same object with varying intensities would be a "dynamic" melody. The effect would differ from the crescendo, diminuendo, or sforzando of tradition because the sound possibilities of the "note complex" are more extensive than those of the simple note.

It would also be possible to realize Schoenberg's *Klangfarbenmelodie*. The width of the note complex permits tessitural and timbral melodies as well as a simple variation of its timbre. We are just beginning to possess the ability to create melodies from the fusion of musical parameters. (These chapters contain certitudes not present in the *Second Journal*.) These are no longer arithmetic variations of pitch, intensity and timbre through duration, but subtle, refined evolutions shaded by the correlation of these parameters. This effect can hardly be imagined without actually hearing the result in the studio.

Further, the original "sampling" was initially transformed. From the discontinuous, heterogeneous note complex of the piano it became a homogeneous, continuous sound that could be sustained like an organ. Moreover, any attack could be applied. Subsequent to this process a three-dimensional melody can be produced that has little in common with the recognizable original "sampling". And the listener, initially surprised by the multi-dimensional evolution of material quickly adapts and is pleased by the play of colour, form, permanence and fluctuation.

The "wide" sound can also be narrowed, its shape changed, or its

timbre varied from penetrating to sombre. These fluctuating nuances exceed the crudely linked events of the first examples. With the realization that a sound object can simultaneously rise in tessitura as its timbre darkens, a new counterpoint becomes possible.

The phonogène[9] plays a major role in these manipulations. Although it is a more general instrument it is not yet as commodious as conventional ones. This generalized instrument, however, does not merely produce a generalized but traditionally based music. If the entire constructional process is considered, it is evident that the result is absolutely different.

After the original sound object has been "homogenized" into a material that has no definitive qualities (the attack, individual shape and dynamic profile of the original sound object have been lost in the process), it can be enriched to form a "weighted note"[10]. In chemistry, similarly, certain molecules exist which are considered more important than larger cells, because of their internal conjunctions. Analogous examples can be found in traditional music where a preoccupation with the material of sound overshadows the harmonic effect. (See figure 2)

Since the sound of the piano had a particular width, it might be assumed that its tessitural evolution would be symmetrical. However, the upper or lower edge of the sound can be altered while the other remains constant, or both can be developed in parallel or contrary motion. (See figure 3) The note can be made constant simply by sustaining it without a second attack. However, as soon as the pitch alterations at the edges of the "weighted" sound becomes perceptible, two voices are heard. Between them is an obscure zone of sound that sinks to the background.

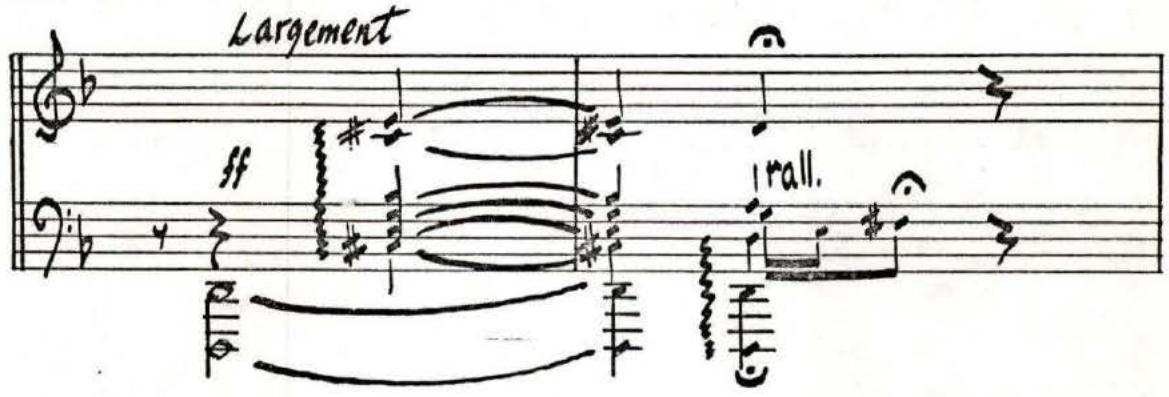


Figure 2.

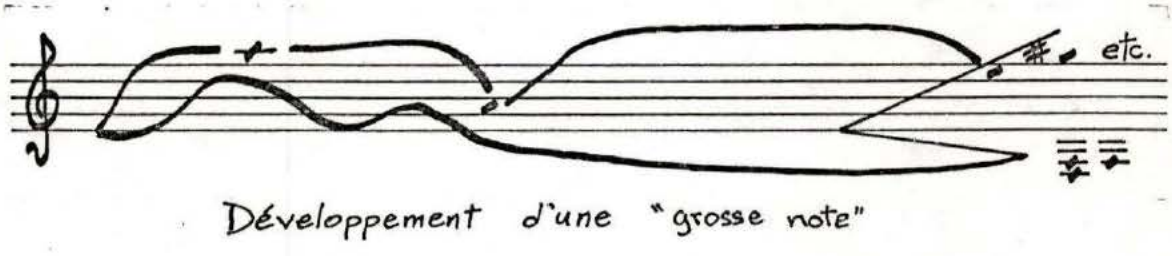


Figure 3.

This single cell, this unique note has propagated contrapuntal voices that are dynamically modulated and composed of elementary notes. The "weighted" note becomes a composite of single notes. The usual musical process, in which groups are constructed from notes, is reversed.

Now consider another example where the musical object is freed from metrical performance. The instruments of concrete music not only engender new structures, or enable these structures to evolve in independent or correlated parameters, they can also create polyphony, or more precisely an ensemble whose different parts develop according to laws of synchronicity. The simplest of these procedures is "total transposition". Pitch and duration can be simultaneously transposed by proportioning the playback speed.

This phenomenon can be described in conventional notation complete with bar-lines. All occidental music, however, presents *ipso facto* obvious metrical correspondences between notes and rhythms. A binary or ternary meter defined by pulse, coinciding harmonies, or double bars is inappropriate to total transposition. It is difficult to cancel the ubiquitous, repeated measure from the score. A three voice fugue, on the other hand, can be created by setting three turntables into motion at different speeds. This fugue, although strict in tessitura and duration, is not the product of compositional or performance facility. Rather, it reflects the perfect adaption of machines.

In order to produce such a fugue, it is important that the material and formal properties of the initial sound object be considered. Those fugues which we produce in the concrete studio were frivolously entitled *bidules*. In the creation of *Bidule en ut*, Pierre Henry was at the piano

and I manned the turntable. We chose a sound object that was a compromise between pure and concrete music. Still, it was rich enough that its acceleration or deceleration in total transposition produced an interesting variety rather than banal homologies. The audible counterpoint that resulted surpassed a counterpoint of notes to define a total counterpoint of objects. Even more advantageous, the irrationality of this counterpoint, in the arithmetic sense of the barline, coexisted with an increased exactitude in a functional, analytical sense. The results, moreover, were engaging and their musical interest genuine, even if an uninitiated audience could not immediately analyse them. (See figure 4)

It is an error to dismiss an automatic fugue such as *Bidule en ut* as a tautology devoid of musical interest. The criteria of this judgement pertains to a music of notes, not of objects. The objects, while remaining mathematically similar are acoustically and aesthetically transformed. After successive auditions, the musician could recognize the three contrapuntal voices, but would have difficulty in realizing that they derived from the same object.

A classical fugue consists of a metrical relationship of voices whose individual tessitura is of no consequence. It is apparent, however, that a new well-tempered clavier could be premised on the law of the relationship between duration and tessitura. If I was attracted by dogmatism, I could very well espouse new rules for composing fugues. Psychologists could be hired to aid me in investigating whether the rhythmic proportionality of total transposition is beneficial to the audition of tessitura.

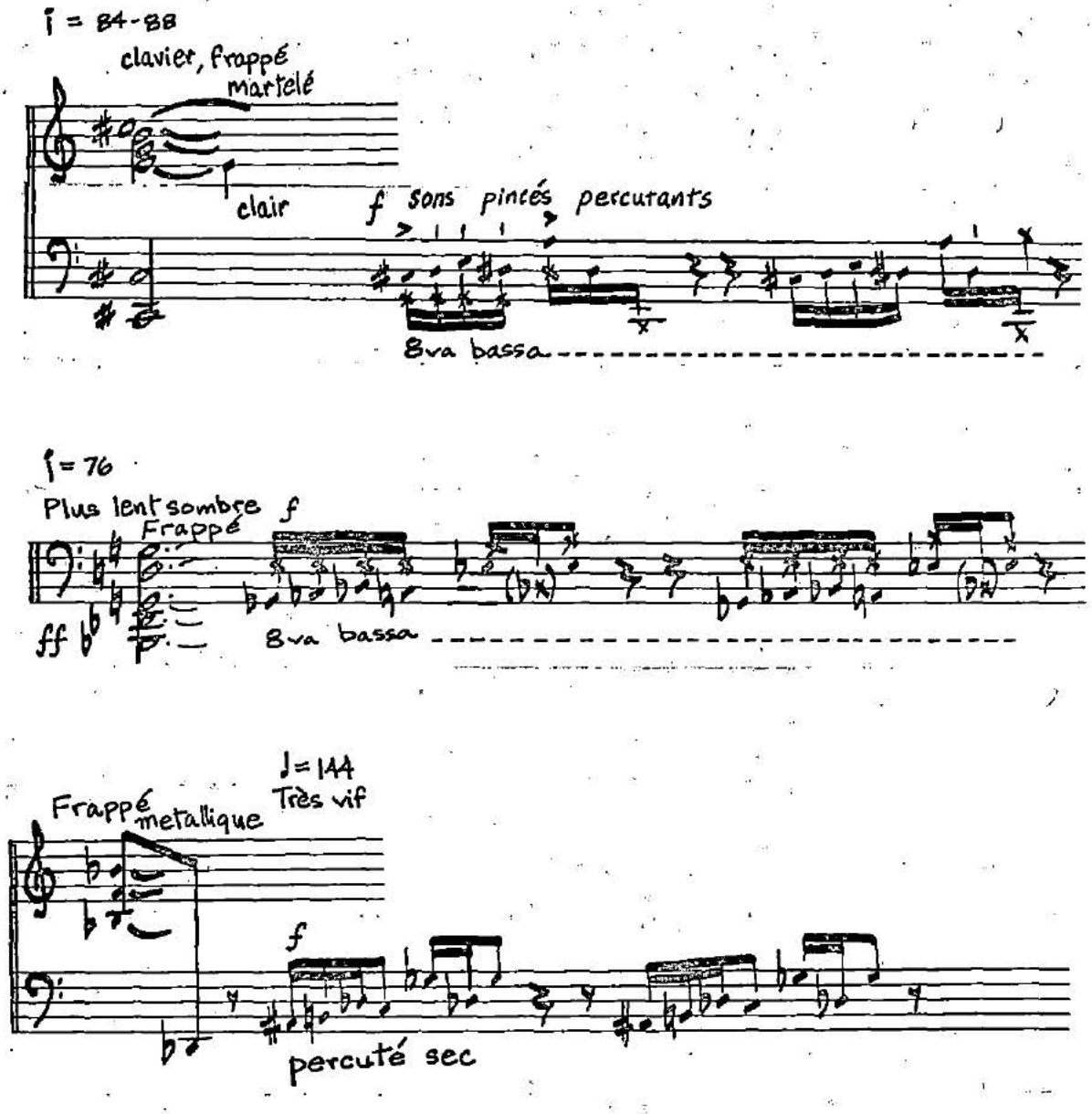

♩ = 84-88
clavier, frappé
martelé
clair
f sons pincés percutants
8va bassa
♩= 76
Plus lent sombre
Frappé
f
ff
8va bassa
♩= 144
Très vif
Frappé metallique
f
percuté sec

Figure 4.

Perhaps there are natural logarhythmic principles which underlie a demonstrable preference to hear low sounds more slowly and high sounds more quickly. Maurice Le Roux has even discovered examples of total transposition in traditional scores. His intellectual curiosity led him to search for correspondences in other sources. This investigation was rewarded by a particularly convincing example from Berlioz's *Symphonie Fantastique*. (See figure 5)

Theoretical as well as practical areas of research are exposed. Not only is the impass over-reached, but the new territory is so varied that its exploration requires a pullulation of inventive minds. Every talented and perservering novice introduced to concrete research will be involved in innovative work. The inherent possibilities of the note complex have not been defined; the resources of total transposition have not been explored. Concrete research, moreover, does not rigidly pre-- scribe procedure. Instead it counsels discretion, reliance on the ear, and respect for the inherent properties of the object under examination. For example, nothing would prevent transforming the object as it is transposed. Segments could be added to it or removed at will. (See figure 6) The objection that concrete music is without form no longer holds. It offers forms that are too precise. The contours of sound objects are even more exact than if they were expressed in notes.

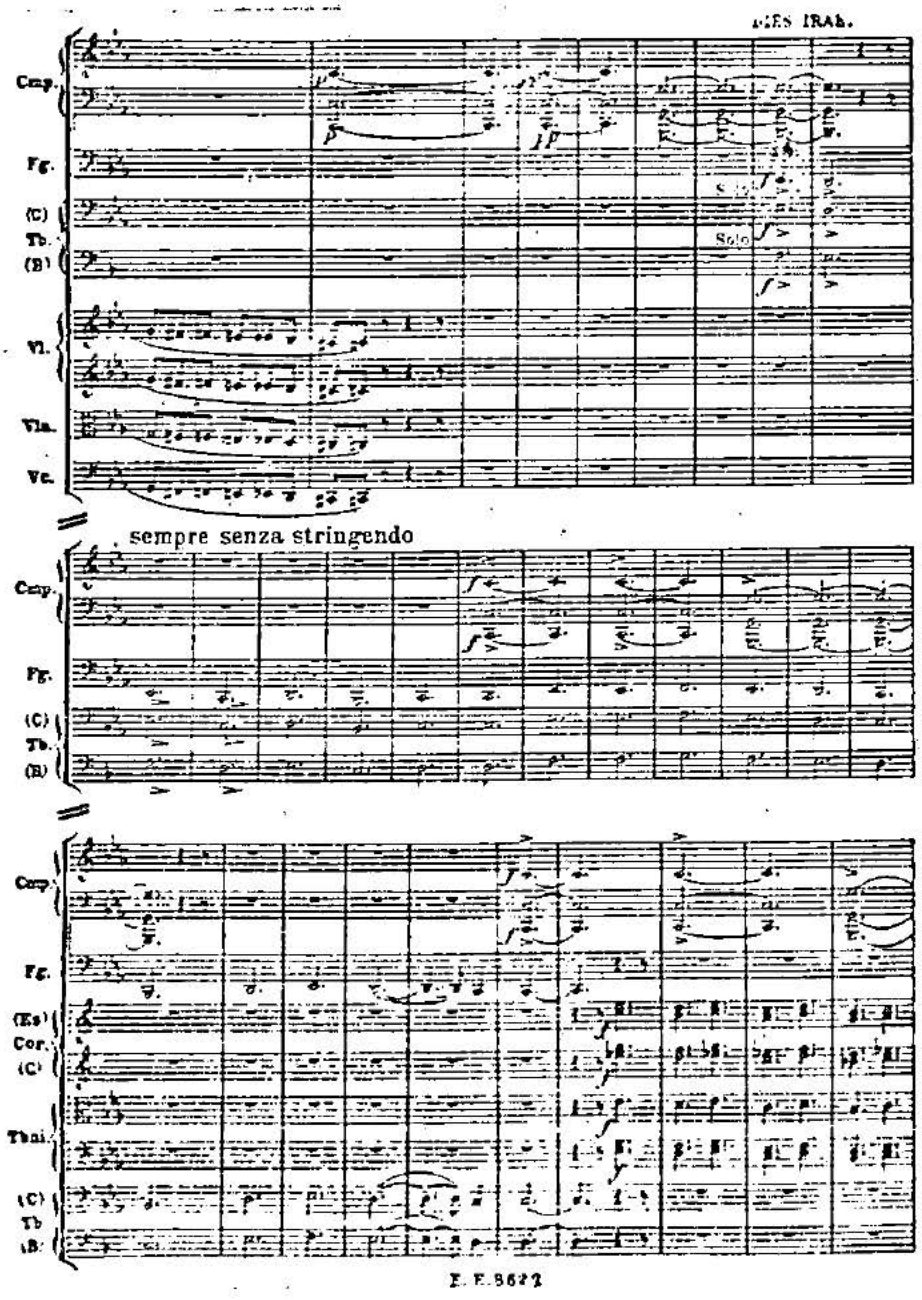


Figure 5 (continued on next page)

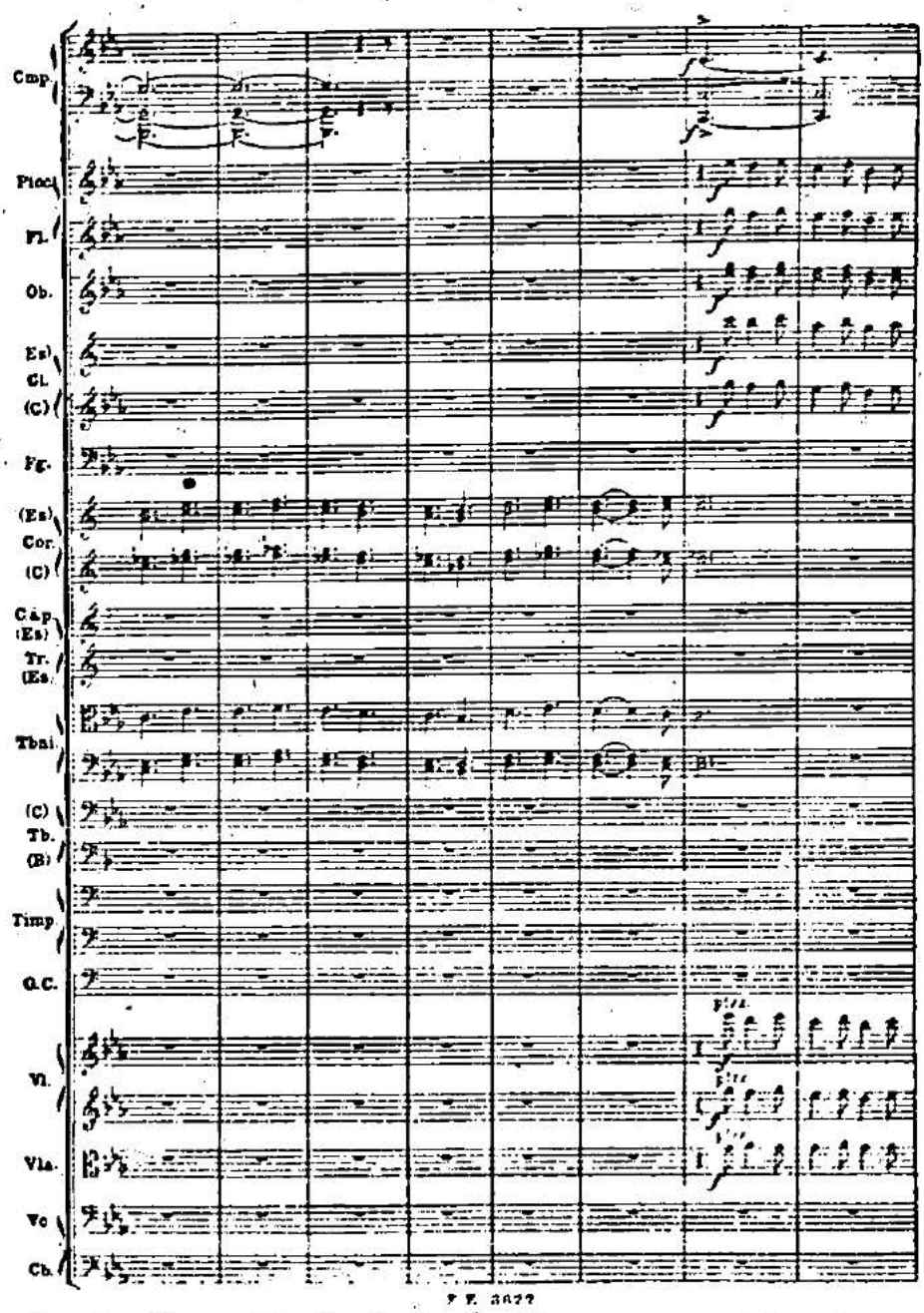


Figure 5. Berlioz: *Symphonie Fantastique*, movement 5. An example of "total transposition" in classical music found by Marice Le Roux. Following the glockenspiels, the Dies Irae appears in the tubas and bassoon. The theme is repeated in the horns and trombones at twice the speed and in a higher tessitura. Finally it appears four times the speed in the violins (p.177), higher again. Total transposition is therefore effected. The change occurs not only in tessitura and tempo but also because of orchestrational changes, in timbre as well.

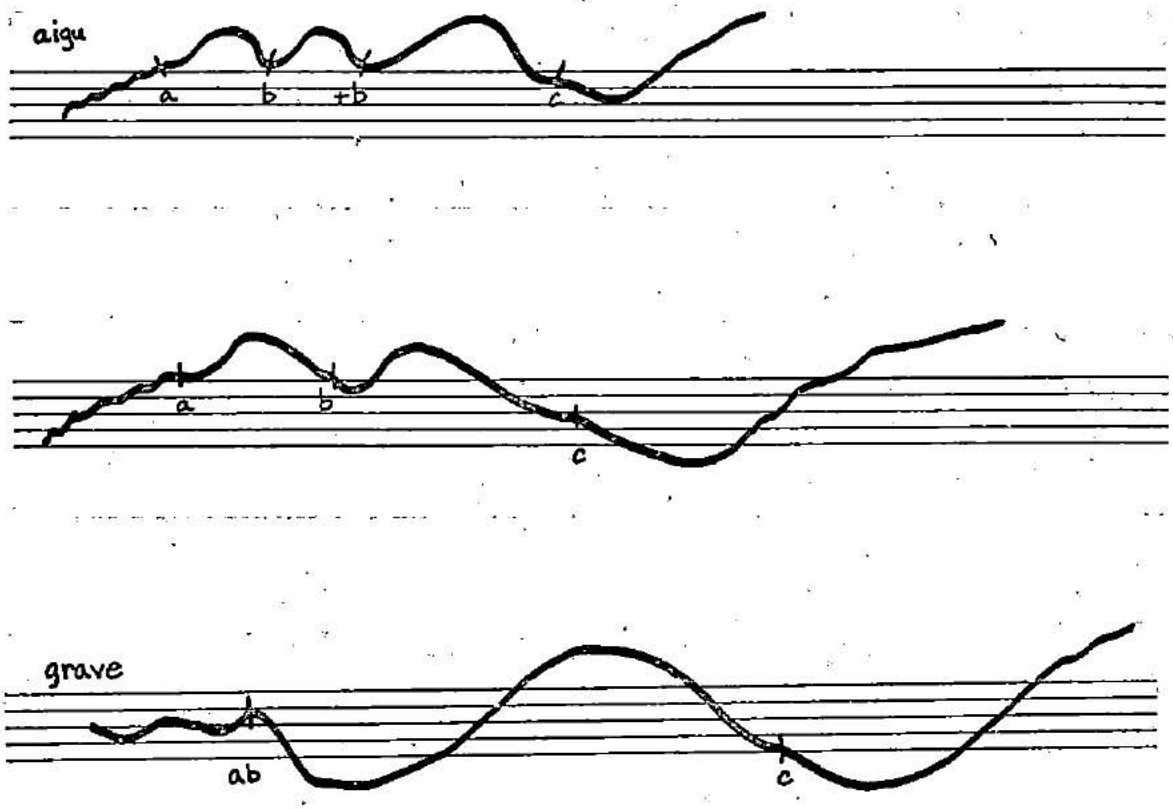


Figure 6.

IV From the Object to Language

". . . . Considering this sea shell, in whose shape I discern a certain 'construction' and the work of some deliberate hand, I ask myself: *Who made it?*" In this quotation from his essay *Man and the Seashell*, Valery indicates the passageway that leads like a strait or isthmus from the world of found objects to that of created objects.

"But soon my question is transformed. It pushes farther into my naivete, and I ask how one recognizes whether or not a given object is *made by man.*"

The expertise of the observer determines his attitude when confronted by an object. (Sound in this case, but I will continue the analogy with the sea shell.) If the observer is naive, his encounter surprises him. "The most valuable discoveries invalidate more often than they confirm our intentional machinations. They consist in facts that are not yet *humanized*, that no imagination could foresee." The experienced mind, however, the connoisseur of sea shells, reflects on his ability 'to make a shell', since its shape recalls an endless number of similar figures." When he asserts that he can make this object, he also indicates that he has understood it. "I have explained it by a system of acts that are eminently mine, and I have thereby exhausted my problem: any attempt to go further would modify it essentially and lead me from an explanation of the sea shell to an explanation of myself. Up to this point, consequently, I can imagine that *the shell was made by man.*"

Valery's authority is reassuring. I am of the opinion that a sound object is effectively humanized when it is chosen, when its construction is perceived, and it is reproduced. It gains the value of a musical

structure. This conclusion is no different from that of the shell collector and his sea shells.

When the found object is compared with those already possessed, two attitudes again surface. The shells would appear complex and disparate to a marble fancier, arranging his objects into piles and series. (Need I add that traditional musical structures are analogous to the marble's simplistic shape?) In the context of a marble collection, the sea shell has either too little or too much meaning and is therefore rejected. The shell collector on the other hand reverses the judgement by asking the marble fancier whether his collection and his actions have increased his self-knowledge. Valery says that the marble collector is able to make only a single thing and in a single way. This object "almost makes itself, and therefore such an action is not truly human (since thought is not necessary to it) and *we do not understand it.*"

Traditional music might also be considered in this way. Music is composed, but it is not certain that it is understood. The simple structure of marbles can be preferred. The sea shell, however, an object from nature, can reveal more about man than can the over-manipulated marble. I am led to consider, as I did in the program of the first concert of concrete music, whether the sound object has any knowledge to impart to us. Concurring with Valery, this knowledge would be essentially human, in that "our deliberate designs and intentional constructions or fabrications seem alien to *our underlying organic activity.*"

I will turn to another of Valery's essays, *Poetry and Abstract Thought,* in order to determine how the shell collector uses the chosen object to communicate with others. The pivotal question is whether music

is a language. At this point, any misunderstanding deriving from a restrictive definition of language must be immediately set aside. If every series of objects that are collected, classed and used in communication can be considered language, then the term can be ubiquitously applied to all the arts, from the stones of sculptures, and the painter's colours, to the images on the screen.

Still it is necessary to differentiate two languages, or more precisely the use of language according to the dictates of poetry or prose. This dual acceptation of language can be illustrated by comparing Paulhan or Parrain to Valery and Souriau.[11] The different aspects of language are contingent on whether language is used as sign or signification, or signal or substance. In the first instance, prose, it is a relational factor whereas in the second, poetry, it is completely autonomous. When language is used as signification, a minimum of material is abstracted to allow the transmission of meaning. When the substance of language predominates, however, language use becomes concrete. The total psycho-sensorial content and all the potential associations of the verbal phenomenon are involved.

One of the pitfalls of the phenomenology of music is that music is used in literature to describe the concrete acceptation of language.[12] Valery states that "every word is an instantaneous amalgamation of a sound and a meaning, without any inter-relation between the two." The conclusion that the poetic content of a word is contained in its sound is followed directly by the conclusion that music is an aspect of poetry. This gives rise to numerous errors.

All the arts, in fact, contain this distinction between poetry and

prose. Figurative painting, for example, has a mimetic relationship with the subject. It plays the role of a sign and can be characterized as a plastic prose. Abstract painting, however, involves form and colour without verisimilitude; as poetry, its material demandssignification in itself, in order that the full potency of its "signals" be released.

/ If the concrete experience has been understood, it is clear that traditional music constitutes a prose rather than a poetic language. Every musical note, like a word contains a *sound* and a *meaning*. A 'c' on the trumpet is a sound that musicians cannot analyse or use; it is also an ensemble of abstract meanings. A mental process must first rapidly assimilate the sound without reference to the sensory ear. I am convinced that the trumpet is a sound imbued with the quality "trumpet", but conscripted to pronounce the word 'c' in a conventional dialogue. It might be thought that the sound must be recognized before the note. The listener would think "trumpet" and not 'c'. But that is the second error. If one thinks "trumpet", one would not escape language but simply take a more prosaic door. In this case, the perceived sound is referenced to a "language of things". This is the disfavoured twin, homonymic although deponent, of verbal language. If one thinks "trumpet", the word is simply being stated through the intermediary of the sound "trumpet". The sound phenomenon has no other effect than the signification of the object. It merely names the object. Through a curious paradox of habit, the concrete aspects of the sound are obscured from the listener. Abstraction, and the causal relationship, in particular, automatically sets in. The totality of the object is obscured. It is impossible to ignore the associations such as wars or historic events that the sound of the trumpet

instigates. These associations are all inherent in the object-word. If "language of things" is anything other than prose, it is akin to verbal poetry, not a poetry of sound objects.

The poetic phenomenon occurs in music only when the ear perceives an unusual sound object that is distinct from the musical language signified by the note, 'c' and distinct from the language of things implied by the object-word "trumpet". Neither a musical sound nor a noise, the pure sound object opens the domain of musical poetics for the first time.

The contradistinction prose-poetry is not only a dual acceptation of the same statements. The prosaic or poetic aspects of language signal two distinct usages whose employment depends on which is most efficacious in a given situation. It appears that poetry was born from play. Man was forced to compose alphabets, manipulate objects, assemble solids, use his limbs in order to survive. Consequently he perceives poetry as gratuitous and without use. In fact, the prose-poetry distinction exists in many domains. Walking has dance as a double. Writing and utilitarian design have the obscure symbol, or the figurative design which is itself divided into the mimetic and the abstract.

If the poetic aspect of human action was long considered an *agrément*, for dream or pleasure, it was also detoured from its gratuitousness and used for august, utilitarian purposes. This is the case of the dance, symbol or chant that is consecrated to religion. Thus, historical periods can be categorized according to their poetic or prosaic use of symbols.

A civilization is prosaic if its symbols are completely adequate to

its needs. If this is not the case, the symbol becomes blurred, loses its content. More importance is given to its form and shape than to its meaning. The middle ages had a verbal poetry, and music vague enough to be poetic. The seventeenth century, however, had almost no trace of poetry. The tragedies of Corneille and Voltaire are not poetry; the music of Lully is discourse. It is language that signifies *la gloire*. The language of the seventeenth century used rhymed alexandrines and was refined in its own way; secondary characteristics did surface. But language made use of poetry as a train uses rails. The alexandrines of the seventeenth century represented a railroad of prosody. With rails of a dozen feet in length, and rhyme like the train bell, it was a more efficient means of travelling. The discourse determined the direction. The poetic aspect of the prosaic alexandrine, subtle and focused, is extremely seductive. This does not warrent a scholarly or imaginative conclusion that it is poetry.

Poetry is born when, as H. Michaux says,"the words turn from the author's flock." The author, moreover, participates in the mutiny. The symptoms of the poetic phenomenon in language are indisputable if not altogether desirable. Rhyme conditions the discourse instead of underlining it; assonance flourishes to the point where sound prevails over the meaning of words. From here to verbal surrealism, from M. Sully Prud'homme to Prévert in the *Diner de Têtes*, (passing other participants in the poetic adventure such as Verlaine and Rimbaud), there is little to anticipate, and little to lose.

Words are used now almost as in lettrism. Within a few years, the surrealists have exhausted the sound of words in a rapid outpouring.[13]

It seems that the motherlode of poetry is exhausted. Like musicians, poets must acknowledge that they can no longer function as poets. They have no choice but to align themselves with experimental poetry.

It was more than caprice or intuition that led me to open the concrete music studio to poets who had broken with verbal poetry just as I had offered it to musicians who no longer were concerned with melody. I anticipated new ground to be broken through a collaboration of poets, musicians, plastic artists accustomed to the abstract, and engineers who are the artisans of concrete sound. Still, it is necessary to renounce everything known or representational, all words or conventional figures, all semblance of language. As poetry gains the ascendance, the musical object will replace the word.

I seem to have contradicted the hope which I mentioned earlier, that music would maintain a connection with language and particularly musical discourse. In order to evaluate this contradiction, I must advance onto uncertain ground. Optimally I will justify the isolation that has been the tenor of my last years in the studio.

It is now necessary to advance personal opinion resulting from my acknowledged preferences. This is in contrast to the demonstrable objectivity of the above which should be valuable to anyone attracted to concrete music. I am always astonished by the disparity in my personal tastes. Despite my musical training, I am indifferent to Mozart, while I have a growing esteem for Bach. For this reason, I have considered the way that these composers use musical language.

Although I would have preferred to discuss lesser composers, the music of Mozart and Bach is not imbued with the heightened sensibility

(such as in Schumann, for example) that I find continually more abhorrent. The fact that the same theme in Bach or Mozart can signify different emotions attracts me. /Sentiment in their music is defined by exterior motivation rather than the composer's frame of mind. This music can therefore have sacred or profane intentions, derive from ceremonial or intimate circumstances, or be circumscribed by an explicit text./

Before the nineteenth century, musical discourse displayed exemplary dignity. It never inherently specified sadness or exaltation, for example. This is certainly not characteristic of Beethoven's music which consequently interests me less. Beethoven is lauded for opening the gates of the heart. He made the string quartet into a vehicle of confidences, and composed a summons from the drums that is so compelling that it was appropriated one hundred and fifty years later as a war-time radio signature. It would be difficult to extract such pathos or pugnacity from the music of Bach or Mozart. Beethoven was the forerunner of increasing musical rhetoric. /Music's progression into self-consuming explication need hardly be mentioned. It is evidenced by all the symphonic poems, romances without words, and questionable lyrical ensembles which preoccupied the imbecilic nineteenth century.[14]/ If music is capable of revealing the language of gods as the Greeks believed, men must stop humanizing it. Under the pretext of greater emotional refinement, they deprive it of interest. Men have efficacious means of intercommunicating but few unsullied by anthropomorphism with which to communicate with the universe. Mozart and Bach speak a language that could possibly be a language of gods.

Mozart, however, with excessive clarity imparts too much information for my taste. I would make the treasonous judgement that his music is

loquacious and simplistic. He offers a musical object that is too easily assimilated and without internal contradiction. Although it is not bound to expressiveness it has no linear development. This object neither interests nor moves me. Mozart serves music adequately, but he has enclosed himself and his listeners in this sphere. He has constructed a closed world, a kind of tautology.

With Bach, however, I experience not only music but a microcosm of the real world. The sphere that the music of Bach defines is both interior and exterior to man. Bach's constructions are replete with contradictions and counterparts, and full of inner tensions. Yet, they maintain serenity in the maelstrom. I am rested and revived in this music. Rather than turning in upon itself Bach's music is an image of the world as an open universe.

It would take a better musician than I to determine the technical explanation for the discrepancy between Bach and Mozart. Still, I would like to advance a hypothesis. Mozart's music is based on a rhetoric comprised of relationships between notes or words. The exposition, development and conclusion are perfectly clear. I experience it as light conversation. It charms some but to me is an imposition. In Bach, however, what the voices say, is inconsequential; I am sensitive to their articulation. They no longer circle within a universe of the dominant pursuing trajectories that dead end. In fact the trajectories are immaterial to me and it therefore matters little whether they trace beautiful themes. I am attracted rather to the intense, obscure relationships between them. Contained in the universe of the dominant, these trajectories suggest relationships and generalizations that are universally applicable.

In observing how certain geniuses utilize language, it is evident that some turn inward with it; their work becomes transitory and limited to their expression. Others traverse the obstacles that language presents and like physicists use symbols to surpass symbols. Their imagnations conceive the inconceivable. They create open worlds which implicate an all-encompassing design that underlies tangible reality.

The direction of my discussion is now evident. Mozart's compositions are of no consequence to concrete music because their simple self-oriented structure are not applicable. In Bach's music, however, the relations between structures are paramount, and appear transformed in concrete music. The functions of the dominant have no commerce with concrete music, but the inter-relations between objects always do.

The question of poetry is now altered. Poetry is to language as philosophy is to thought. These terms, "philosophy", "poetry", are used to indicate an absence of strict conventions or rules. If prefiguration is avoided this freedom is fortuitous; if an interplay of words or ideas is obscured it is regrettable. Poetry and philosophy are reservoirs of expectation, limbos before an adequate language or more audacious thought. For *Gestaltheorie* (sic) to be more than philosophic jargon, it must usher in a new scientific methodology. It is not profane to apply *Gestaltheorie* to the music of Bach. Rather, it would apply the entire man, his intellectual as well as his somatic existence to the study of this expansive musical object, Bach's composition. Not only is a more universal music revealed, but also the universe beyond music. The key to the relationship between objects, and between subject and object proceeds from these principles.

If the object can offer us anything it will not be in the manner of tired words or symbols that are exhausted of all evocative power. It will be as stars or atoms out of which all poetry will proceed: a new level of knowledge.

V From the Object to the Subject

Our curiosity returns us to the sea shell. A gift of nature has no commentary. When man is confronted by such a gratuitous object he acts like a young and heedless animal, quickly abandoning one occupation to pursue his new find. There are many contemporary examples of this behavior. I fear too much success in my endeavour. The concept of the object has been completely rejected by those who espouse direct communication between subjects. But new initiates to concrete music are fixated on the object. This is the root of my apprehension. In considering only the object, they ignore the actions of the subjects; they do not acknowledge that someone made or selected the object, and in turn someone perceived it, and in some mysterious, ingenuous way was affected by it.

I would prefer that concrete music involved both the object and the subjects, ergo the complete process. An objective zone would be circumscribed in music where the object, its perception and creation would be susceptible of analytical examination. In addition there would be an awareness of the two symmetrical relationships that trace the interplay between the object and the two subjects. In principle these active or passive relationships allow the object to be used to communicate, following the hypothesis of language. More simply and mysteriously however they connect the two subjects into communion with the object.

I am concerned that I will encounter two mind-sets. They accept scientific methodology and are certainly not conservative but neither is receptive to my new approach. One line of thought presumes everything to be language, allowing no direct relationship between the subject and the object. The same argument from a relativist standpoint dictates that

any human use of an object would necessarily be conventional. The other stance, ignoring all precedents, would agree that the subject and object condition each other, then slavishly set about measuring the influence. The human body would be hooked to a galvanometer like a frog. The ear is assaulted with concrete sounds deprived of poetry, and the responses are measured as was the saliva flow and the muscular contractions of Pavlov's dogs. Far from fantasy, experimentation of this sort is already being pursued. Biologists have found that body "impedance", conditioned by awareness in general, is stimulated by sound. From here, one might formulate a roster of sounds measured in psycho-galvanic megohms. Since body impedance is materially modified by sudoriferous glands, perhaps scientific laws could be found which governed the relationship between musical impressions and perspiration. But to what purpose?

I observed a respectable couple at a concert. The music made them euphoric as their feet synchronized with the baton of the conductor (who is revered as a magisterial metronome, a master oscillator). These same liberal minded people would smile patronizingly at a film of equally respectable Africans aroused by a drum. They are certain that their own music contains the elixir of untainted spirituality despite the revealing feet, the ingenuous, uncontrolled tapping.

The composing *subject* must also be considered. He might be isolated in a studio near the Roman pines immortalized by Respighi. Surrounded by writing accoutrements, perhaps he chews his pencil, or like a student in an examination sticks out his tongue. Without doubt some scrupulous scientist is eager to measure its length.

There are, however, unconscious composers who create concrete music

although they are unaware of their actions. These adolescents are amateur practitioners of onomatopaeia. They imitate war-whoops or with labial sounds, explosives, raucous whistles, noises of the lips or cheeks, forceful exhalations of breath, slapping the thighs, comment on some event and communicate their personal vision or frame of mind to their chums. They are unconcerned with the dominant function or six-eight meter. No pitch-interval or rational rhythm would suffice to exteriorize this somatic communication.

Melody is not only predetermined by the contractions of the larynx.* The thoractic cage, the thighs and the tongue have *designs* of their own to reveal. Man is connected to sound with more than his voice or resonating vocal chords. He aspires to perfect Pythagorean intervals with his throat. Yet, his entire body is responsive to sounds other than the pitched scale. Just as an "inner melody" exists, so the human body contains a nascent concrete music.

I must point out an ideological convergence between Motherlant who entitled a chapter of *Rélève du Matin,* "The Profound Melody"; Charles Lalo who, in *Eléments d'esthetique Musicale Scientifique,* used the term "interior melody" in a literal sense; and François le Lionnais who in a recent conversation informed me of his belief in a hidden correspondence between musical forms and forms intrinsic to man. The subject responds to the object following a chain reaction that moves from the sensorial

---

*This is more than metaphor. It has been demonstrated that when a melody is heard the larynx contracts and details it without emitting sound. It involves a general principle of the psychology of sensations which specifies that "every image is realized by a movement". (cf. Charles Lalo, *Elément d'une esthetique musicale scientifique)*

to the spiritual by means of a material or somatic realization. In music the chain (subject-object-subject) is extensive, linking worlds that otherwise would be hermetically sealed from each other. This constitutes one of the primary attributes of music. In this context, it is difficult to explain those musicians who are preoccupied exclusively with the object or with one of the subjects. They are indifferent towards the most compelling musical phenomenon.

An investigation of the object at the centre of the chain would be more concerned with consciousness than construction. How is the object made? How is it perceived? The question of its perception is contingent on science. It is answered through the work and interaction of biologists, psychologists, historians, philologists, ethnologists or accousticians. There is much to do, particularly if these diverse specialties are to become interconnected rather than remaining isolated. Studies of music in individual disciplines are not without interest, but they remain particular to the discipline involved (a biological study, for example, or a historical study). Music is connective and must thus be understood. There is every chance that these specialists would overlook the essential.

The study of music must primarily be concerned with the relationship between the subject and the object. The advent of this study accentuates a regressive isolationist tendency that affects all disciplines. A new discipline, concerned with inter-relations, would be necessary to bridge divergent specialties. The relatively unknown area of cybernetics would seem to meet this requirement. According to its founder, Norbert Weiner, cybernetics is "the theory of communication and control between living

beings, societies, or machines." In our civilization, man is always the poorly shod shoemaker. Although such a theory could have vital applications to human health, societies and self-knowledge, cybernetics has been sequestered in the world of machines where this discipline was first directed. Motivated by a sordid utilitarianism, cybernetics investigates machines as if they were gratuitous and natural rather than man-made. This situation is remarkably reversed, however, when it is realized that this study of machines-cum-natural entitites can indicate how man might investigate himself. This is not a triumph of materialism, it is rather an approach to spirituality, clarity, and revelation through radical materialism.

Man's use of cybernetics to study himself is analogous to a similar use of music which I have intimated. Man creates machines according to an interior mechanism instead of an interior melody. These machines must therefore in some way be finite and partial replicas of man. Machines enlarge or caricature man, allowing him to probe inpenetrable aspects of himself. Similarly, the study of music is partly the study of man. It should not, therefore, merely circumscribe a superficial relationship between subject and object. It is infinitely more probable that this relationship marks an intrinsic correspondence.

It is apparent which musical attitudes, whether traditional or modern promote the perception of these relationships. Objective impressions must prevail over decadent expressiveness in music. Words, however, cannot explain this. A falsely explicative language is inadequate to a phenomenon that has more need of being felt than named. Music is a specific kind of language if it is one at all. There is no more parallel

between music and discourse than between sound and light. Sound and light provide different categories of information. Intelligence and feeling are complementary, interconnected spheres. Music must remain in its own domain. Like language in a classical epoch it would then be used to its fullest extent.

The question of "how music is made" has been answered. Now the question of "why it is made" must be broached. The obvious reply is that music is necessary for the comprehension of man. At this point, because of its particular course, my argument may provoke facile agreement. If the same question had been approached another way, it might have met denial or indifference. If I had asserted that music is a gratuitous or a utilitarian art, for example, I would have raised indignation. Instead, there is agreement to the contrary. It is important therefore that the difficulty be exposed.

I particularly have in mind some questions that were asked during a discussion of concrete music held at Aix-en-Provence under the auspices of UNESCO. The session, entitled, "Humanism and Music" was intended to probe the purpose of music. The meeting resulted in cacaphony. Vague speculation and the most extreme sentimentality were given free rein. It was said that music was a communication with the infinite, or a cause of Joy. More moderate hypotheses sought historical justification, sketching an evolutionary path which began in ancient Greece. Idealism metamorphosed into historical determinism. Then someone stated that in *an earlier age* music originated in the sacred. Although the proposition lacked substance and seemed to be without foundation, it was not contradicted. When and how music had lost its sacred ties cannot be ascertained. Yet, the most

conservative delegates concurred with this version of the genesis of music.

Unanimity was also reached in the unconditional condemnation of "functional" music as used in factories to increase production. Yet music might feed the worker's inner life, alleviating a situation where his hands are occupied but his mind scours a countryside of boredom and spiritual misery. No-one was concerned by this possibility. Universal consensus of the musical orthodoxy can be reached in a condemnation of any music pigeon-holed under the infamous, simple-minded term of "functional". But the same congregation venerated gregorian chant. They were able to accommodate the image of chanting monks without ever considering that this music exists precisely because it is exceptionally functional.

The musical orthodoxy will admit some of traditional music's limitations. It is generally agreed, for example, that music cut off from the senses or the concrete aspects of sound is intellectually restrictive. Similarly, historical and geographical limitations are voiced. But the contradictions and the limitation of music's function through the persistence of a dubious aesthetic is never acknowledged.

In this regard, reference is given to eighteenth century Art motivated by pleasure; or a vague and mystical sensibility is invoked which in truth is raw emotionalism. Spirituality is intrinsic to Bach, but excluded from African music. An abyss separates the sacred according to Bach and sacred in the terms of another culture. Yet nothing in the human body will explain or corroborate these differentiations. While the musical orthodoxy pursue such attitudes, their children ape African primitivism. The

frenetic dancing in nightclubs perhaps indicates that more divinity and humanity, or at least more fervour and instinctive warmth resides in hot jazz than in the music of the *prix de Rome*. And perhaps ultimately it is more *useful*.

A consideration of Bach will demonstrate the evolution of the relation between subject and object. Good intentions do not make artists; it is necessary that genius be initially present. Bach's compositions, therefore, cannot be considered outside of a religious context. The mysticism of Bach's music is not invalidated by image of the composer as a domesticated patriarch, dutifully conducting his cantatas every Sunday. On the contrary, miracles and visions often come from ordinary men of strong constitution. We project our own dislocation onto the extraordinary output of Bach; we recognize one aspect as ingenious and the other as mystical. Yet, when Bach expresses mysticism through the musical object, the two aspects are united. Mysticism merges with technique. Bach develops fugues, constructs compositions in the exacting universe of the dominant, calculates affinities and aversions. I imagine him as an architect-priest meditating on the fugal voices and revealing the identity of the divine and the human. He participates in the mystery of incarnation.

Bach, however, cannot be heard without reconciling spirit and technique. A poor musician would never penetrate this edifice. He would only gain a vague impression of an alien world. Similarly, a theorist who drily analyses the cantatas without invoking the world of faith would contemplate lifeless stone. There can be no cathedrals without prayer. Music is far more than entertainment.

Valery's idea is again appropriate. The object cannot be understood unless the listener can reproduce it. Bach's music must be heard in the context of musical understanding and spiritual preparation.

I used Bach in order to benefit from apogean perspective of music. I cannot say what other less sublime examples would demonstrate. Bach's music implies a civilization, a specific technique, and a conception of the world. The musical object addresses particular subjects. All humanity regretably do not have access to it. It must be admitted then that all musics partake of this relationship with the spiritual, even if the manifestation is humble. African music appears non-intellectual, appealing viscerally to the instinctive man. Form in this case is not a variation of the object. As the repetition suggests, it is an interior journey that the subject creates himself. (This has never been completely discerned.) The journey may be primitive or directed towards eroticism or violence. Still, it does not lessen the necessity of confronting the subjective reality of music.

The first experience of concrete music is more shocking to listener than to composer. This forces an examination of the subjective experience in music. There is something hubristic in listening to an evolving sound object, for one does not only listen. The experience is visceral and involves nerves and muscles. Our psyches may be affected, or sounds may be injurious to the body. In fact, concrete research has affected my health. There can be no doubt that music is dangerous play.

I anticipated that concrete music would continue traditional games with known rules. But the object resisted and would not participate. When cast in an outmoded style it froze. It asserted itself.

Consequently, I have learned to listen to the real substance of the object rather than referencing it to something else. The object may seem trivial or refuse to conform to compositional intentions. One must be silent after listening; in this silence new possibilities will emerge.

Melody, as Stricker indicated,[15] is not sketched only by the larynx. Concrete sound penetrates some part of man that is disquieting and obscured. The associations that diverse results are confused; they point out the misunderstanding that separates composer and listener. The question must again be raised if language can exist under these circumstances, or if concrete music, at this stage, must communicate.

When series are constructed that conform to traditional schemes, new possibilities are over-ruled. An instinctive onomatopoeia might result in a more visceral music. Certainly, one result of the release of concrete sound is fear or distress. Young composers pursue such results; they have insufficient human experience to be concerned about the effects of their sounds. I desire a more visceral music, but not if it is violent or injurious.

The opposite possibility, however, is more distasteful to me. Extreme intellectualism, uncontrolled by instinct, causes only anguish. This is a very contemporary phenomenon. The creation of sounds in this manner illustrates lesser men at their work. They are like the sorceror's apprentice whose sorcery outdistances his ability. I am not interested in success at this price. I advise concrete composers to consider the sounds that they release, rather than abnegating responsibility by adopting automatic formulae. Finally, they must consider who might be injured and who might profit from their work.

VI Concrete Music: The State of the Art

A man who forays into virgin country away from the cultural paths of his epoch, is often astonished years hence to find himself surrounded by other fugitives. Like Birnam wood at Dunsinane, inanimate trees prove to be adventurers camouflaged in foliage. When the precursor pauses, however, he drops to the rear-guard. Previously separated from his age, it seems more attractive to him on his return. He relinquishes his place at the forefront, content to support those who follow.

Astonishment is particular to the self-taught who are always somewhat solitary and incult. A more experienced man would never have ventured the exploration; its embryogenesis was ridiculously outmoded. An aesthete in the crowd, in fact, would affirm, "*That* was done in 1924. . . " But ignorance of precedents has its benefits. It allows ideas to be tried, and consequently the chance exists that the predecessor will be exceeded. Knowledge is even unfortunate when, corroded by snobbery, it has no experiential base. Another, double-edged snobbery uncritically admires the latest discovery while despising the technique of its creation. As if the results were sewn with invisible thread, the procedure is not perceived.

Handlebars are put on a bicycle and we are transfixed. It is an audacious act, especially if it foreshadows the future. It is also infantile and derives from an elementary psychology. The action is interesting in both lights. Further it is a bluff. I am surrounded, for example, by composers who no longer love music. Rather than listening to their work, they form enervating presuppositions. From the perspective of simplistic graphs and half understood 'parameters', they consider

their music to be masterly. In truth their results are shocking. Although I retain the intellectual and technical procedure of these machinations, I reject systematization and blind application. Strictures are increased and referential material is forbidden; the race for the outrageous is intensified. I am thanked for facilitating the means, supplying the cyclists with pedals. They go faster in the fog.

One of life's curious paradoxes led me to propose an experimental method in music. This presupposes scientific methodology in which theory is controlled by result. The response to my work varies. Traditional musicians perceive it as unnatural because they are suspicious of any experimentation that is not directed towards an intelligible composition. Others invade the studio; under the pretext of experimentation, they immerse themselves in theory, insist on measured values and ape the engineers. It is assuring to them to assign a number to a sound or measure a pitch to a double decimal. They bewilder their students. I would suggest that they apply an experimental method to their work. This would confine it within a musical objective. As it is they are involved in sonic algebra, a combinatory analysis of an isolated object.

I too studied the musical object; but I considered the subject as well. Experimentation in music involves *listening* to the entire process. The courage of the enterprise lies in attempting to define humanity and beauty in an unfamiliar object. This is an exercise of choice and taste, not an adherence to a kilometric and calibrated road. Courage is also inherent in the requisite honesty that rejects untenable or injurious objects. One must be prepared to burn one's furniture in order to discover a purer and more durable lacquer.

Birnam wood is in motion. I am able to see the work of those compatriots whom I have fortuitously encountered. Nothing can be more exciting than discovering others whose work is similar to one's own, even if their perspectives differ. John Cage put screws into a piano; it is not criticizing this action to say that it was unconscious. He is a Columbus who, fascinated by the first island that he encounters, builds a villa. Varese elevated percussion, the poor relation of the orchestra, to the status of the orchestra itself. I do not know the details, but his electronic vignettes and noises are similar to my results. A French man, he did not remain in France. He did not have the fortune, as did the concrete musician, to be a prophet in his own country, although he was honoured in Germany and New York. Varese probed the potential of traditional orchestra instruments, without using devices such as the prepared piano. It is therefore remarkable that his music is so similar to concrete music.

The Germans have also applied electronics to sound. Not only do they desire to renew timbre, but they have touched the "essence of pitch", by creating percussion sounds in the bass frequencies. The effect of their work approximates concrete music yet is more transparent and impoverished. Although these colleagues use concrete sound objects, they are primarily concerned with exploring the instruments that produce their material. My Eureka is missing from their endeavours. They constantly "play" a music whose composition is informed by the instrument. Their fixation on the means of production has obscured the object from them. They are furiously preoccupied with this hidden object, although they have never touched it.

The work of Maurice Martinot has concentrated on traditional aspects of music, and as a result his instrument displays great respect for the nuance and clarity of pitch. (A man is defined by his work whether the material of the invention be steel, waves or electrons.) Martinot has created an instrument whose potential is not yet apparent to composers. At present, the Ondes Martinot parallels the conservative timbres of classical music. However, this instrument may ultimately serve to systematize the immense realm of sounds liberated by concrete music. Although the resulting series of sounds might be limited, it would serve to reconcile the divergent complex note with the classical note.

It is not remarkable that interest in electronic instruments has been limited. Conventional instruments provide sufficient timbral differentiation to delineate the polyphonic voices of traditional music. When timbre becomes a structural dimension of music, however, instruments such as the Ondes Martinot are not radical enough. Not only would it be necessary to extend the range of timbres, but to abandon pitch as well.

From the periphery of the traditional orchestra, the Ondes Martinot awaits the advent of a new orchestra. As misunderstanding might have arisen from the use of this instrument in concrete music, I am glad that it has never figured in my work. The Ondes Martinot will evolve towards a new function when there is greater surety in the use of timbre in relation to pitch, and further when the note complex can be better accommodated.

Acolytes in concrete music should be warned. They desire to play the new instruments that they encounter, even though it has never been ascertained that these are instruments of music. They might very well be

instruments of analysis or aids to the creative imagination. This strange realization might lead me to compose for orchestra, although I am hardly a *prix de Rome*. Drawing on my experience in concrete music, I would create orchestral works that were not connected to the dominant function nor to atonalism. I would incorporate otherwise unavailable sounds from the *phonogène* thereby entrusting to the orchestra the development of the raw, contusive, unmanageable sound object. This approach to composition would yield results similar to the "weighted note" (discussed in Chapter III). It would bridge the gap between a music of pitch and one of objects.

The process can be reversed. A musician experienced in concrete music will recognize certain kinship in *Wozzeck*, for example. Similarly, Messiaen is a precursor of these developments even though his music uses traditional means. His prescience does not lie only in his choice of material, nor is it defined by his experimentation with systematic constructions which employed traditionally oriented series. Rather, Messiaen was cognisant of the musical object before it was specified by concrete music. His use of birdsong, for example, was not inspired by sentimentality or a desire to imitate; it was a concrete experience. The discourse of birds provided Messiaen with an object that was also a language. The modulating birdsongs, although not human, contain designs of greater intrinsic interest than anything specified by an algebraic graph. A bird is a living participant in the universe. The algebra of birdsong is organic and infinitely more complex than a number series. Yet this algebra is simple; it is also more efficacious because it is mysteriously connected to human sensibility.

I will clarify my position by discussing two procedural possibilities that are more desirable than *a priori* mathematics. While the difficulties of construction have been discussed, it perhaps has not been sufficiently emphasized that the thorniest problems involved musical structure and few resources existed to facilitate their solution. Simultaneously, the *means* of creating music expanded enormously. Whether or not music is a language, or whether it can find inspiration in the plastic arts are pertinent considerations. The use of birdsong has demonstrated that a composer can escape anthropomorphism through models found in nature. Perhaps a leaf of holly could also be used to suggest a working method to the concrete composer. It has colour, surface sheen, and precise inner curves which define a variety of points that are subtle exercises on the same theme. The *morceau en forme de poire* was merely a whim. The *melodie en forme de houx* is not an empty proposition. Polyphony inspired by a bouquet of holly is a realizable experiment.

What authority decided that music is a language and not a piece of holly? A spoken phrase can be recorded then transformed so that all verbal content becomes rhythm and melody. This also is a viable compositional procedure. Although its melodic and rhythmic inflections are distanced from harmonic norms, it still corresponds with human sensibility through its constructions.

Contemporary composers, in fact, are entangled in their initial approaches to composition. The inevitability of *a priori* schemes are preferred over intuitive designs. Hitherto, the composer composed unconsciously at his writing desk.

Number series appear suddenly as the solution to the present compositional quandary which has resulted from an excess of choice.

Yet because dodecaphony is a negative rule, there is no longer an exercise of will. Positive directives such as representation or imitation must be substituted.

I recently viewed an excellent coloured film produced in New York by Ferdinand Leger. In commenting on his methods, the artist unhesitantly insisted on the object. According to Léger the subject (this word, of course taken in the context of the visual arts) has finally been replaced by the object. I can imagine Léger travelling through America, or in the streets of New York visually garnering diverse objects. These would be redesigned in a painterly way that displayed freedom as well as fidelity to the object. The artistic piece arises from this. Whoever sees the film will be seduced by its style, even if the viewer is not enamoured of Léger's entire output. Léger denies that his paintings are abstract and more likely would describe his work as concrete. Yet it would be imperceptive not to recognize that the origins of abstract painting are similar.

Either an abstract painting consists of meaningless markings and automatic designs, or else it is an intentional or unintended imitation of some universal pattern. Even if the presence of the exterior world can be denied, interior patterns are unavoidable. Forms are dictated to the artist at the level of somatic reflexes by an ever-present kinaesthesia. This is in accordance with Le Lionnais's statement that man projects his intrinsic forms into his art.*

---

*Stricker, as early as 1885, states, "After hearing a melody, subject retains something which is non-acoustic. He has a concept of melody not connected to any sonic image." (S.Stricker, *Du Langue et de la Musique*)

In composition, there is good reason to separate the instrumental means from the schematic directives. When technique is primitive, composition will be defined by the imperfections. The open strings of the violin, for example, were the first to be exploited, and music that used the early instrument was informed by this particular instrumental disposition. Military fanfares, similarly, are integral to the bugle. Formal directives on the other hand, must be consciously experienced. Otherwise, they are transformed into systematization, complication, or arbitrary simplification.

The Conservatoire's demand to study technique, is apropos. Concrete technique exists at a compositional and a technical-instrumental level. First of all, however, it must be considered at the level of solfege.

A new solfege has not been defined or clarified, and as a result to most concrete or non-concrete composers are unaware of it. These problems, therefore, remain obtruse. An extensive dictionary of terminology pertaining to a new solfege cannot be included at this point, although I will cursorily touch upon seminal ideas. The three traditional musical *variables* (pitch, duration, and timbre) are insufficient to accommodate a generalized music. Of course, these *variables* are the three physical dimensions of sound which, at one time, completely defined music. In organic chemistry, compounds must be analysed in terms of radicals, as well as in terms of elements such as oxygen or hydrogen. Similarly, in music which is also organic, it is necessary to recognize series of musical entities. These form basic sound families to which any sound can be appended.

Beyond the *dimensions* of music, three *planes (tessitura, dynamics,*

spectrum) can be established where the dimensions interact. These planes would not be concerned with the melody or harmony of a work, but would rather characterize a fragment of sound considered as a fixed object. The object would then be used in possible variations or evolutions.

Concrete instruments allow the composer to act in these planes. The phonogene is concerned primarily with *tessitura* and filters with *spectrum.* New apparatus is awaited that will be able to control the dynamic structure of sound. The problem of realizing a preconceived sound object is theoretically solved as is the problem of assembling objects. Yet provisional solutions are untrustworthy. Whether sound objects are complex or simple, they can be organized only be means of montage. Instead of an instrumentally determined interplay of notes and chords, there is a construction of scissors and glue that determines relationships between notes and harmonic mixes.

Our predecessors would have advised the composer to consider the physical properties of the voice, or to compose for the pianist's hands. Just as the performer's muscles informed the quality of his own performance, so they determined composition. The composer's work was therefore circumscribed by the physical limitation of others, as well as by the interior designs provided by his own physical and mental being. Cutting and collaging concrete music are acts of patience dictated by intellect. The mind, however, is prey to error when it is separated from its inner melody as well as from the exterior projection of this melody through the muscles of other people. It is tempting to somehow replace the muscular limitations of traditional music.

Future technical research in music, for example, might be oriented

towards a transformation of the physical act of music. Although apparatus that might accomplish this is conceivable, there is question as to whether it would be indispensable or profitable. I think that there is no value in providing equipment that would reinstate physical limitations, simply because composers cannot contend with the intellectual gymnastics which have been substituted. Instead, composers must learn to 'think with their hands'.

A member of an audience at a concert of concrete music mistakenly thought that the technician at the controls had instigated the sounds. Pursuing his pleasant illusion, he thought that he had witnessed an unimaginably spontaneous musical creation. I corrected him. The technician had so little to do that I had considered adding a spatial dimension to the music. This would reinstate an interconnection between sound and action. One difficulty, however, is only compounded by another. Adding a new dimension would also add another unknown.

Spatiality in concrete music is either integrated into the composition or is added as part of the final process by directing the sound. Confusion, however, remains a possibility. When concrete sound objects imply a plastic construction, physical listening conditions should perhaps be considered. These designs would then correspond to actual designs perceived three dimensionally in the concert hall. This would be contrary to a situation in which they would be aspacial or pure as in traditional music where instrumental placement in the orchestra is insignificant. In any case different aspects of spatiality must be distinguished in order to study them.

There is still hope for apparatus that would connect an actual

musical gesture to the production of the sound object. The gesture then would be as obvious as manually controlled stereophony. It is difficult to know which prognostic to follow, however, especially since everything in modern technical development indicates an opposite tendency. The spontaneity of film, for example, is only apparent. It is reached through exacting and laborious coordination that does not connect hand to mind, but specialist to specialist, technician to artist, chemist to actor. In cinematography, spatial considerations are supplementary rather than major problems. / The concrete music tape is nothing other than a cinema of sound./ ***

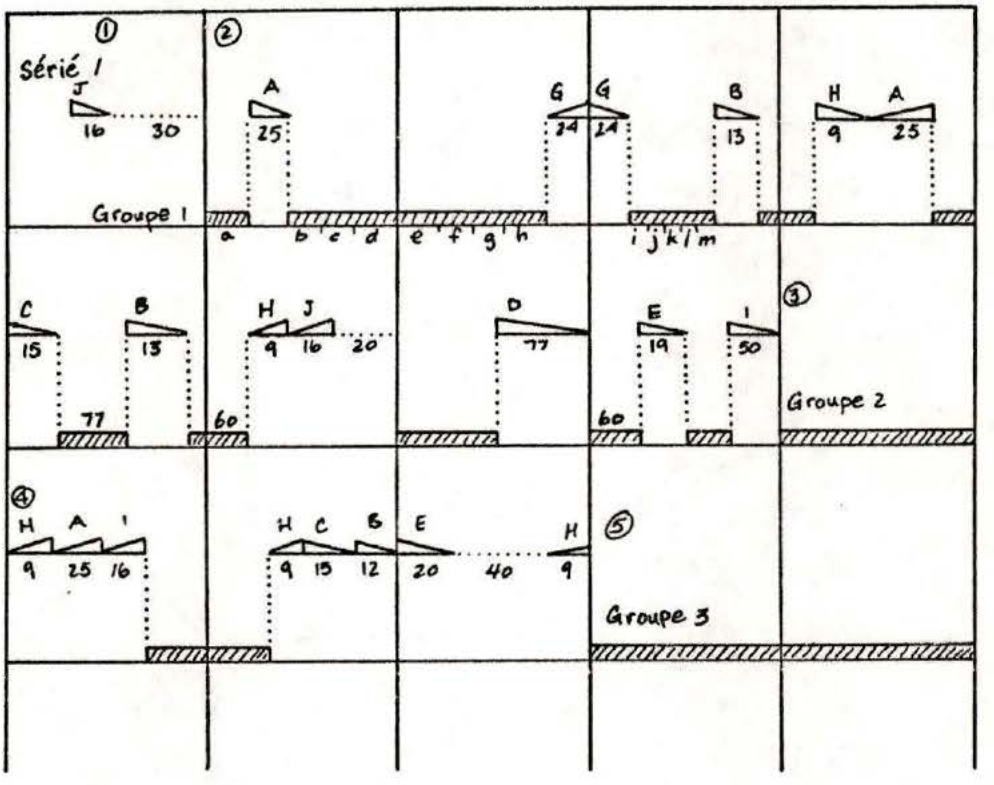
New works however continue to be composed. Instrumental contingencies might dictate these constructions; or experimental designs might be applied to sound with equally experimental results. The works of Pierre Henry, composed after the completion of my *Second Journal,* illustrate both of these compositional tendencies. The evolution of his style can be divided into two periods. His former style effected a balanced relationship between available instrumental possibilities and artistic inspiration. The group of pieces entitled *Microphone bien tempéré* bear a conscious control of sound material and utilize engaging plastic designs. The short piece, *Batterie Fugace,* and a series of pieces called *Tam-Tam* were successfully broadcast and performed outside France. They outline the continuity between the previously irreconciliable spheres of melodic and percussion instruments. With means that were still crude, Henry achieved meolodies of percussion and delicately sketched trajectories of sound within the musical planes of tessitura, dynamics and spectrum.

A recent work of Pierre Henry and another by Pierre Boulez indicate another tendency in concrete music. In the first movement (at yet the only completed movement) of Henry's three voice work, *Antiphony*, cells of continuous variation are opposed in the manner of double choirs to sequences of differing complex sounds. These latter are organized into series, and a separate organization governs the composition as a whole. Although the work is short, it demonstrates a new aspect of concrete construction. Judgement at this initial stage however is still the perogative of the composer. Time must pass before these new works can be assessed.

Composition is no longer approximate as it was in the days of turn tables. Magnetic tape allows a compositional exactitude that is evident in work sketches which serve as scores and constructional directions. (See figure 7) Boulez extracts systematic variations from his original sound by altering a parameter. (See figure 8) His work is more of a study than a composition although the rhythmic language and timbral melody are compelling. The original sound is clearly differentiated in order that certain effects can be realized. It is not harmonically or melodically diversified, but the study does not aspire to this.

It is wrong, therefore, to assume that concrete music represents a school defined by a single aesthetic. The young composers involved in concrete music believe in the need for innovation; otherwise, they are of divergent dispositions.

Moreover, concrete music is undergoing enormous transformations. In order to perceive the current state of the art as well as to predict future developments, this realization is essential. The only parallel



Antiphonie : 2 parties alternées par opposition
① séquences (A) à (J) notes complexes de la série I
partie supérieure (a) à (m) tronçons des groupes
(▨) partie inférieure ◺ note endroit
◺ note rétrogradée _____ silences
16 - 30 - 25 durée en cms unité de temps à 60 cm ♩

Figure 7.

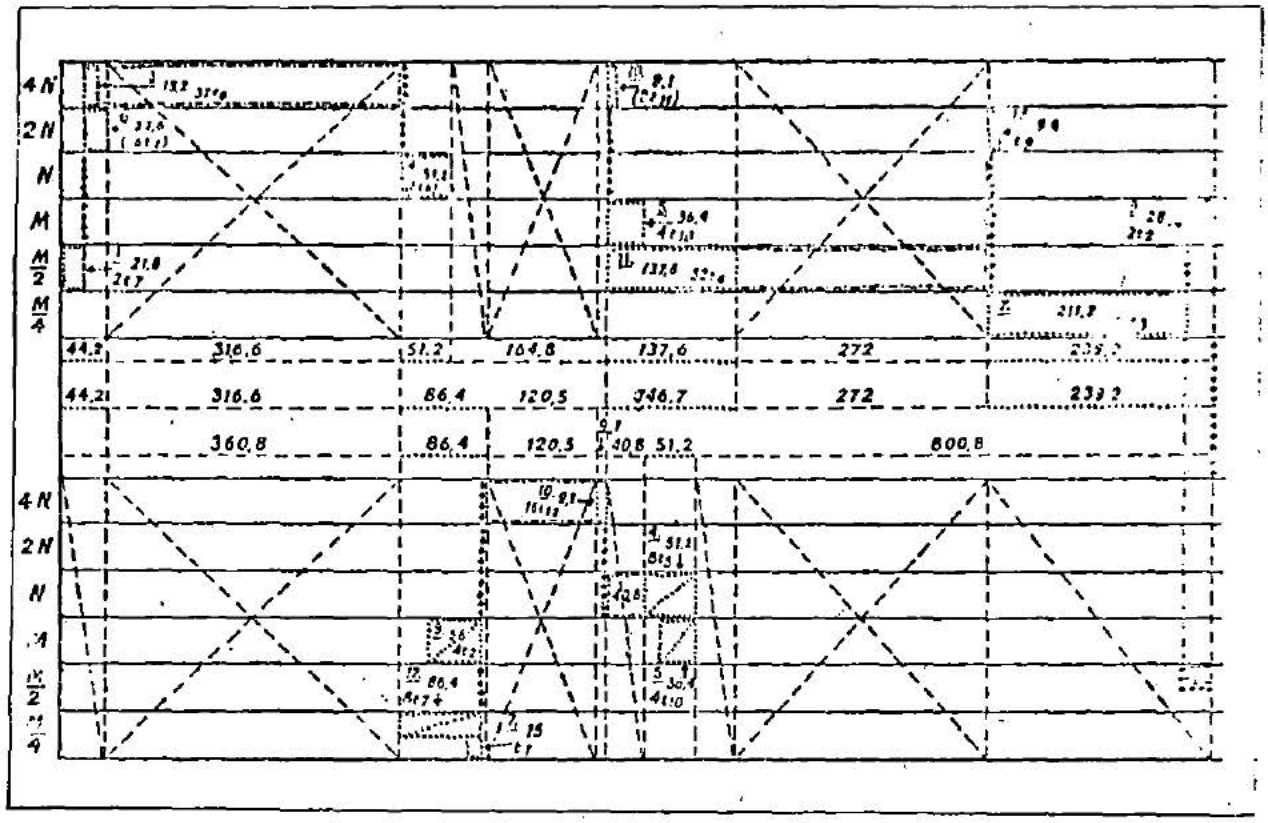


Figure 8. Etude on a single tone by Pierre Boulez. This study is based on the interpolation of transpositions of a tone in tessitura and duration. A complete keyboard is obtained. First, beginning with the original sound, twelve chromatic tones are produced by the phonogene. The replay speed of these tones is then multiplied or divided to obtain 6 registers: multiples or divisions of normal speed N or half speed (moitie, ed.) M where $M=\frac{N}{2}$. (4N, 2N, N, M, $\frac{M}{2}$, $\frac{M}{4}$). Register 4N comprises tones noted as t1, t2, etc. When register 2N is used the tones are notated 2t1, 2t2 etc. In this way, a sort of "tessitura" of time is created.

This study is thus composed of series of tones whoes durations are calculated to form "parallel series". For example, when tone t3 (4N) is given the duration 32t, a silence (notated with dotted lines) results.

Tones are circled if they move to the right and diagonnally barred if they are reversed.

The study contains a superposition of two polyphonies.

would be the evolution of painting after impressionism. While this evolution in art spanned fifty years and was delineated by recognizable stages, concrete music is simultaneously impressionistic, cubist, surrealist and realist. And these manifestations are readily apparent. The idea and technique of fragmenting colour, of placing stroke against stroke, of considering colour before form, or deriving form from colour, constitute impressionism. Cubism involves decomposition in volumes. The subject in cubism and impressionism exists as a pretext for the discovery of new objects that are implied in its form or colour. When the concrete composer divides material into new volumes (note complexes) or exploits timbre (*Klangfarbenmelodie*) without renouncing music, he is acting as the cubist or impressionist painter. In this analogy, it is necessary that some reference to traditional musical language, some semblance of harmony or melody, be continued.

Other painters, excluded the subject (in the context of painting) from their works and were freed from representational considerations. The sound object in an analogous situation gains individuation and can be assembled into series or ensembles that replace melody and harmony. Concrete music parallels abstract painting. In this case, the appelation, abstract, is more appropriate than concrete although terminology is inconsequential. Still, surrealism and realism, the tenors of the psychic or the geometric, are yet to be considered. The range of concrete music is demonstrated in the works of composers as different -- *mutatis mutandis* -- as are the painters Manet, Braque, Dali, or Léger. Music is threatened by the explosion of possibilities.

The technical and human potential of concrete music cannot be

ascertained, A rich and weighty past holds music to the single dimension of pitch. African music, at least in its most primitive manifestations, has been preoccupied with varied percussion instruments for thousands of years. Oriental music differs from both occidental and African music by emphasizing a delicacy of touch, a fluidity of the sound body which overshadows formal concerns. Amongst these diverse musical experiences exists a precedent for concrete music.* The difficulty lies in comparing the fastidious customs and techniques of a music preoccupied with pitch, to other musics that are less learned yet more complex.

Pitch is a predominant dimension because the ear is particularly endowed to differentiate pitch. If the eye was capable of perceiving colour in terms of angstroms, painting would be a music of colours; and as a play of pure radiations it would be devoid of form and *material support*. Occidental music is preoccupied with the numerical pitch values of sounds. The concrete experience however reveals the sonic eye at the interior of the ear; it is sensitive to the forms and colours of sound and almost unconnected to the musical ear. Moreover, since there are two eyes, as ears, the sonic eye is sensitive to the spatiality of sound.

---

*I have only made passing reference to the incongruous connection between music and so-called primitive musics. Yet, this connection is important. It is timely to recognize that extremes are being reconciled. The discovery of sound objects is the final cry of occidental technique. The resulting objects, however, have more rapport with exotic music than with a music that does not involve sound colour. Moreover, the aesthetic and psychical impressions produced by concrete music inevitably lead to reflection on the position of music in other civilizations. Finally, the problems which exotic or primitive musics present to the occidental musicologist can be approached in a new perspective through concrete music. Limitations of space and my own lack of expertise prevents a consideration of these issues in depth. Someday, however, such studies will be undertaken by a specialist in exotic musics who is also experienced in concrete music. Having distanced himself from occidental music, he will be better able to appreciate the music of other cultures.

Imagine a perfect chord. It would consist of three notes of unusual colour and form but with relatively pure fundamental pitches. One would be a pulsation, another a series of fluctuating attacks, and the third, "aeolian", created by the disturbance of a sound body. Moreover, these notes would consist of evolving a material, and trace individual spatial paths. More than just forming a chord, these sounds change through time and space. Concrete music is an awareness of this phenomenon that cannot yet be realized by any known instrument.

VII Farewell to Concrete Music

An astonishing gap separates the first stammerings of the *Journal de la Musique Concrete* and these pre-emptory final chapters. This discrepancy is partly the distance between one's ideals and reality; events do not always conform to the systems that we intend for them. The other explanation, however, is that the two works were not written by the same author. The first is the result of ingenuity, the second of reflection. Quite possibly they are both valid. Certainly I am very cognizant of this differentiation, and would ask the reader to be similarly aware.

There is no reason that an inventor should possess an objective perspective of the future development of his work. The inventor might even be the least qualified to make such evaluations. Although he can influence immediate applications, his successors control the future. Similarly it is anomalous to expect the inventor to philosophize about the position of his invention within a contemporary context.

I do not pretend to be the perspicacious inventor-philosopher. My ambition is more permissible if more extreme. I want to write about concrete music as if I were totally another person.

There is a great difference between working in a studio with machines and sounds, and confining oneself to a typewriter in order to record thoughts about concrete music. No longer the inventor of equipment who manipulated sounds, I manipulate thoughts and words.

Finally there is a third man who is ill at ease in the presence of any machine whether it be for writing or singing. I must regretfully admit that even though I strongly insisted on his participation, this maladroit figure is the musician. I continue to be concerned that the machines will

require too much technical expertise, and the musician will be excluded. This situation has forced me to be a musician in addition to my other roles.

Such exceptional circumstances are awkward and cannot be sustained. I am tired of ambivalence and fear that others will also grow weary of ambiguity. Even possessed by three demons, I cannot cover everything; and each of the demons promotes his own saint. Perhaps the future will present less eccentric men each contributing individual expertise. They would perhaps be more limited, yet also their efforts would be concerted. Ambiguity and ambivalence are aspects of the preliminary stages.

In order to speak or write about my work, I separated my roles. As engineer, I was for a long time concerned with machines. As a musician, I used sounds rather than words to construct works; I continue to be attached to these works even though they were tentative. The author, however, understandably is concerned only that his writing will provide stimulus to thought.

Paradoxically, concrete music has existed to the present as fortunate misunderstandings. Although it incontestably renewed the material and form of sound, it was artists and poets, not musicians who were attracted to it. It also demanded that all apriorism be relinquished in favour of studio experience and experimentation. Yet, the first contingent of musical volunteers were dodecaphonists. Uncertain laboratory experimentation, assuredly revolutionary and outrageous to the ear, becomes an Administration that encourages anarchy.

For an individual as divided as I have been throughout this enterprise, such success is hardly fortuitous. I dreamt of classicism, of

the harmony of the spheres, where man and God would speak the same language. Instead of adding dimensions to the existing universe, however, I am floundering in formlessness. Atonalists surround me, eyeing me hungrily. They do not, however, succumb to their cannibalistic urges; I am preserved by their hope that someday I will civilize them.

For the musician, five years of concrete music continue; the future of music and musicians is involved in this aspect of the endeavour. For the writer, however, it is time to make assessments and pass on the task. I am not abandoning the enterprise. The means and the results of concrete music still concern me. I am only renouncing my activity as a composer. In any case, others have already picked up the gauntlet. I have no bitterness but rather the realization that my efforts are better directed in researching the means. Furthermore, it is not my intention to give new and magical brooms to irresponsible riders although no-one these days can predict the future.

The technology of sound is already on a radical track. The "most general" instruments figure like maquettes in our studios. They are not yet easily applied to composition and their potential has not been realized. Yet these instruments can completely modify the material and form of sound; it is no longer adequate to make commutations of sound. Cybernetics will doubtless play a role in this last development.

The direction of concrete music will be determined by its projected purpose. Its aim might be universal or it might only provide for the ephemeral success of the few. If success brings endurance, perhaps the two aims will proceed parallel to each other. However, if self-interest is the only motive for action in society, and return profit the only

criterion of patrons, all action will be directed to the pursuit of profitable art. In addition there is a politic of scientific research and machiavellian disinterest.

Collective activity is particularly characteristic of this period. Musicians, accustomed to august solitude, will be startled when this tendency touches their domain. (Collectivization will be more surprising in France and Germany than in America or the U.S.S.R.) Atomic physicists work in laboratories that resemble factories rather than behind desks or in traditional "labs". Sarcasm or indignation, however, meet the suggestion that in future, music will involve an assemblage analogous to physicists around their cyclotrons. Yet music more than any discipline is collective. The traditional orchestra is a case in point. If the orchestra is replaced by sonic reproduction and cinematographic spatialization, it would be necessary to replace it. A contrary development would be a new orchestra completely comprised of composers. More than in the earlier orchestral situation, they would create the work, becoming complete artisans.

For those experientially involved with sound, concrete music is only beginning. Knowledge and musicianship are prerequisites to an appreciation of jazz or the classics. Concrete music has similar requirements, and is not immediately accessible to the uninitiated. It has so profoundly renewed the phenomenon of musical communication and contemplation that it was necessary for me to write these Chapters. The concrete realm demands complete immersion; this entails an understanding of the object and the preparation of the subject.

Finally, concrete music anticipates a small non-specialist audience. A fraction of the general public, this audience would itself be experimental. My writing, however, is directed to the concrete composer more than to this audience. It will be the composer's experimentation with sound that the audience will ultimately experience.

L'EXPERIENCE CONCRETE EN MUSIQUE

FOOTNOTES

[1]Rencontres Internationales de Genève. September, 1948. The content of this chapter is based on Ansermet's article that resulted from this conference: Ernest Ansermet, "L'Experience Musicale et le Monde d'Aujourd'hui," *Ecrits sur la Musique*, ed., J.-Claude Piguet (Switzerland, 1971).

[2]The journals which form the first two sections of *A la Recherche*.

[3]Lettrisme was a literary movement launched in France after the second world war by poet Isidore Isou. The letter rather than the word was considered the essential element. This resulted in a poetry concerned with sound and typography.

[4]Luc-André Marcel, "Arnold Schoenberg," *Cahiers du Sud*, vol. 24 (2 Semestre, 1951): 130.

[5]Pierre Boulez, *Etude I and II;* Olivier Messaien, *Timbres-Durées*.

[6]This phrase was in English in the original text.

[7]*A la Recherche:* 102. Schaeffer had studied the symmetrical relationship of the antecedant and consequent phrases of a folk melody. He rhetorically asked if there was a psycho-aesthetic difference between the two melodic segments, and whether there was an objective difference between the segment order A B as opposed to B A making the former more satisfying.

[8]Schaeffer defines the "note complex" as a monophonic element with a precise existence, equivalent to a tone in music. Its duration can be short or long.

[9]The phonogene was a device developed by Schaeffer in collaboration with Jacques Poullin. It played back tape loops at variable speeds.

[10]A "grosse note" is a "note complex" which is long in duration; its attack, resonance, and decay are developed. Schaeffer adds that if the "grosse note" attains a certain length, it would be perceived as a group or an evolution whose rhythm, timbre, and tessitura would be susceptible to analysis.

[11]The division of language into prose and poetry (Schaeffer cum Valery) is not universally accepted. W.H. Auden, for example, states: "The difference between verse and prose is self-evident, but it is a sheer waste of time to look for a definition of the difference between poetry and prose." He also questions the basis of Valery's distinction (also used by Schaeffer) that separates the language into the gratuitous and the useful. Further, he notes that in English, the difference between poetic and conversational language is purposefully minimalized. This is not the case in French. "But French poetry, both in the way it is written and the way it is recited, has emphasized and glorified the difference between itself and everyday speech; in French drama, verse and prose *are* different languages." see W.H. Auden, "Writing," *The Poet's Work: 29 Masters of 20th Century Poetry on the Origins and Practice of Their Art*, ed. Reginald Gibbons (Boston, 1979): 240.

[12]see above footnote to the Introduction #1.

[13]Schaeffer uses a number of contemporary poets as examples to illustrate his argument. I have taken editorial liberty to omit this enumeration; this does not detract from the original meaning. see *A la Recherche:* 162.

[14]*le stupide XIX Siècle*. This phrase is attributed to Balzac in Paul Robert, *Dictionnaire* (Paris, 1970): 1699.

[15]S. Strickler is quoted and footnoted by Schaeffer below. see translation:

LA MUSIQUE ECARTELEE

Jorg Mager, an experimenter with techniques of electronic sound production early in the century once made the awestruck exclamation: "an ocean of sound is before me!" His insight into the potential of electronic sound and its implications predates Stockhausen in Cologne and Meyer-Eppler in Bonn, whose work in electro-acoustic music did not begin until mid-century. It even preceded the development of many electronic musical instruments, such as Bode's *melochord* or Trautwein's *trautonium* which Hindemith used in Berlin in the 1930's. Other electronic musical instruments, such as the *theremin* (1927) or the *ondes martinot* (1928), were invented, but assimilated into traditional music. Composers such as Honnegar, Milhaud, Jolivet and Messiaen, for example, used the *ondes martinot* in their compositions; these were, however, electronic musical instruments which were used to play traditional music. In spite of Mager's prescience, the "ocean" had been diverted into the development of instruments. Its acoustic potential was held in abeyance for half a century.

Then, in the middle of the century, a means of dealing directly with sound -- either by montaging natural sounds or by electronic synthesis -- suddenly emerged. Herman Scherchen, the conductor, was to describe the event as the "electro-acoustic irruption" in his magazine *Gravesaner Blatter*. In the space of two years *Concrete Music* (Paris, 1948) and *Electronic Music* (Cologne, 1950) were established. Both schools found their original impetus outside of musical aesthetics. Independent contemporaries included Varèse, who incorporated noise into music; John Cage, who developed the prepared piano; and Vladimir Ussachevsky, who initiated tape music.

Concrete Music taped natural sounds from musical and non-musical sources to form a preliminary material for which compositional methods gradually evolved. These methods which had already been applied to the image in cinematography, initially consisted of constructing collages by means of record discs and gave way in turn to filtering, mixing and assembling sound electronically on a tape recorder. *Electronic Music* in Cologne provided new and barely imaginable sounds through sound synthesis.

I witnessed these divergent approaches to sound as they were being thrown into opposition 25 years ago. While the French and Americans chose empiricism, the Germans, and later Boulez, opted for systematization. There remained two sources of inspiration, two primary currents of thought, a preference for natural models and another for contrived or synthetic models.

I readily admit my predilection for natural materials, my preference for the grain of wood or marble, for the formal properties of a seashell or an agate. I dread a profusion of synthetic materials which are too homogenous, too malleable and suggest no inherent form.

But the two divergent laboratories (Paris and Cologne, with myself at the former), two enemy brothers in electro-acoustics, shared the necessity of working through magnetic tape, of being heard through loudspeakers and of emptying the podium of human interpretors. Together they made Mager's "ocean of sound" a reality, a reality which swamped performers in its wake.

While it is possible to face off music which is made through live performers with music which is made through loudspeakers, this is (although a popular aesthetic distinction) not in fact the fundamental

problem of contemporary music, an issue under discussion here. This problem arose, rather, through a complex musical intrigue, which in fact took place elsewhere in the realm of musical theory. It seems to me that one can speak of a kind of "squeeze"[1]. The horizon shrank to 12 tones and to the inflexible rules of serialism, with its concomitant predeterminism. As a consequence, performance practice was refined in order to accommodate the continuously more precise and even punctilious exigencies inherent in the works of composers haunted by these strictures. A parallel could be drawn with Puritanism and Jansenism but I would put it more colloquially: *les vaches maigre de la musique.*

Distinguished and even masterly music has paced about in this prison for a good fifty years, its substance withering under the scrupulosity of serialism, simultaneously neglecting a wider more general audience. It should be noted in passing, however, that the general public was not deprived of its music. Throughout the same period, as a result of radio and then television, of microphones and turntables, the public has been deluged with sound, covering the whole expanse of traditional music. Musical ideas, subsequent to the second Viennese school of Schoenberg, Webern and Berg during these years of trial and error experienced a paradoxical evolution. Contrary to their original intentions their development can be described as follows:

They were, firstly, *concrete* despite themselves. The rules of dodecaphony stretched the ear beyond its habitual listening patterns.

---

[1]English in original text.

What remained to be heard in a music lacking tonality and often lacking memorable melodies or reasonable counterpoint? No one in the last fifty years has had the nerve to actually face the music.

Since timbre, attack, sustained sound, the infinitesimal fluctuations of sound became over-refined, *sonorities rather than musical ideas were heard.* In a process aiming at abstraction, tending towards the quintessence of form, form was no longer perceptible. In all of the performances, consistent in their extreme difficulty, there emerged from the sonic refinement a delicacy of the perceived sound object which supported (O scandal!) the affirmations of the opposite school of those who resorted to natural and concrete sound. Thus the extremes touched and sonority flourished, across a wasteland.

Equally, the process of composition was affected. Serialism was so constraining and artificial, that by an extension of its arbitrary principles it led to disorder. Just as it was applied to the 12 tones of the chromatic scale it could as well be applied to anything else -- sequences, for example, or whole scores. Since the formal basis was a mathematical model, other similar mathematical designs could be called upon, either a recurring scheme or an aleatoric distribution.

This was the period when the most important aspect of a concert was to read the programme notes. The ear was ordered to hear according to the intentions of the composer, according to the preconceived scheme. In fact listening took place in a fog. Not only was the actual sound different from that which was announced in the programme notes, but it was insignificant as well. The ultimate result was boredom. The performers, however, remained brilliant and reassuring. From the midst

of the clamour their remarkable performances could still be admired.

These 20 years of extreme boredom, marked in Paris, for example, by the concerts of the *Domain Musical*, had a number of logical outcomes. Scores were permutated so that a work was never performed in the same way twice. It was all very clever. In Italy it was called "an open work". Behind this game the composer yielded some of his control and it was necessary to be grateful to him for this act. It was in effect a period of self-analysis and criticism, the composer's contemporaries did not ignore the fact that he had sinned through will to power just as the conductor sinned through abuse of power.

Not only the work but the composer himself was thrown into question. After he was commanded to develop an original *language* for every situation, it was suggested to him that he take the supreme sacrifice and simply disappear. He was to analyze his own desire for power and politely commit suicide. At the very most he was permitted to bequeath his last wishes as a creative artist to the performers, unless he confided the musical process to a computer: *deus ex machina*. In this extraordinary and ongoing set of circumstances, the most moral composer was the one who best realized his own demise, or invented the most subtle form of self-annihilation.

Self-criticism became a contagion and spread from composer to conductor. It was not enough that the conductor abandon his baton, but he was also to relinquish his sovereignty. Each performer, reputedly creative in his own right, was required to participate in the work, nourish it with his talents, and, if possible, improvise. Even though jazz had already demonstrated that improvisation is rooted in structures

from which defined freedoms unfold, improvisation without rules was the order of the day. Each instrumentalist would no longer simply add his sound; he would instead freely improvise, prompted by the graffiti on the score. A parallel could be drawn between an ensemble of 12 such performers and 12 turntables or tape recorders, each playing anything at random.

Naturally enough, musical writing disappeared since notation expressed an overprecise intention. It was sufficient merely to free someone else's initiative in order to make a conceptual intent. There was no longer any score to represent the purely potential if not non-existent composition. The score, however, could be revived for its graphic quality and resold to an art dealer if he thought well enough of it visually.

None of the important aspects of music remained, neither work nor composer, score nor conductor. This placed the performers in the spot-light. They could be observed as rugby players in a game, but unlike rugby, music no longer had rules. Musicians were transformed into actors. Previously, the spectacle of the performers would be subservient to the music itself. Now the contrary would prevail as music would be no more than a pretext for theatre. The name "theatre-music" was given to this exteriorization.

Wholly opposed to this development was a related interiorization, a search for *nirvana*, John Cage was the zealous *fakir* who demanded access to the innermost ear. What was actually heard was inconsequential; it was the order of intentionality rather than that of empiricism that mattered. It was up to the individual to make his own music, a theory followed by

Steve Reich and repetitive music.

It was an ultimate fantasy which advocated an economy of material to the point of repetition *ad nauseum*. At best it was meditative, but it could equally be an opiate.

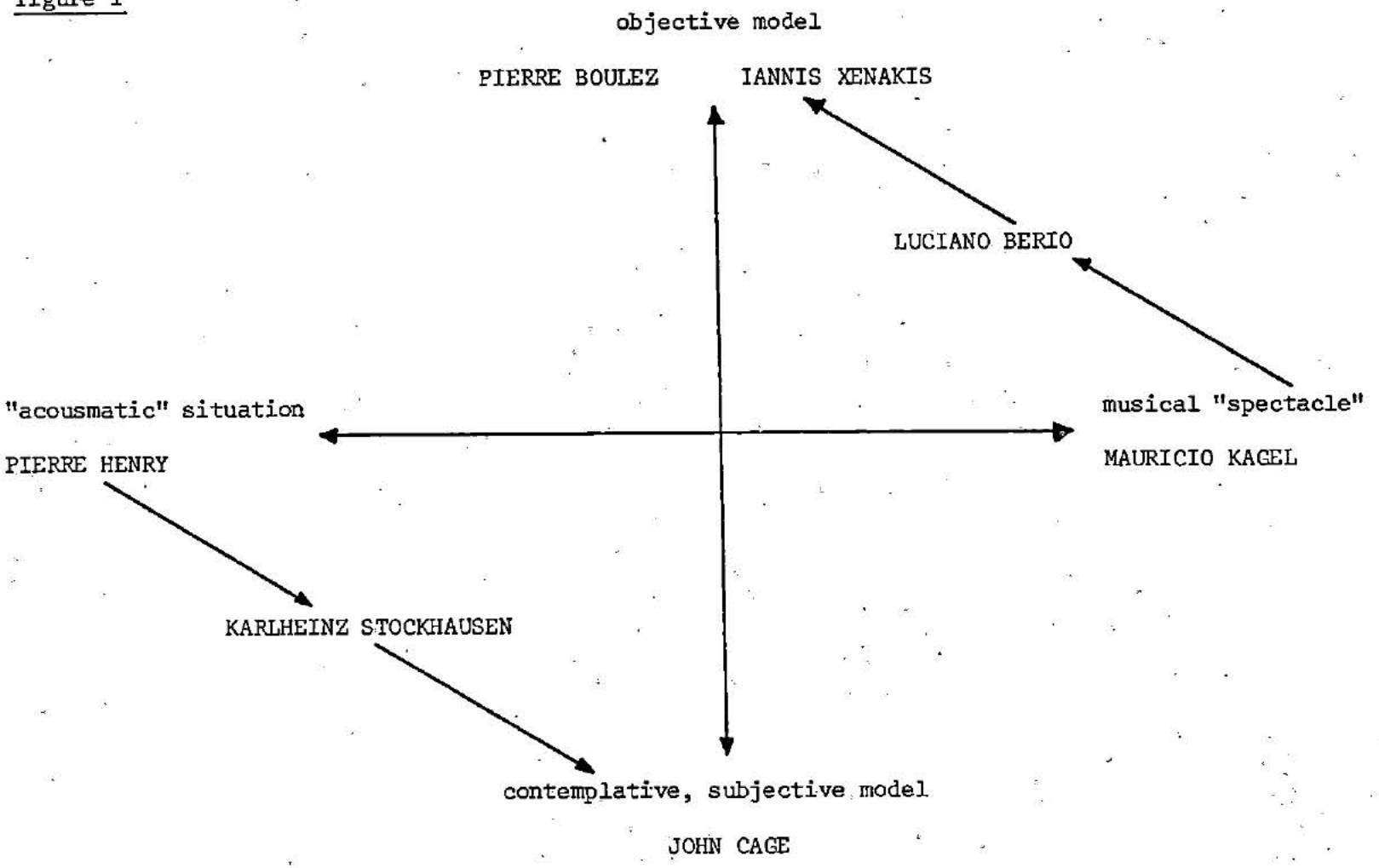
It is a seemingly impossible task, after outlining all these contradictions, to draw conclusions, or at least establish some order from such disparity. In some cases an objectivity replaced the work itself with its model, substituting for creative invention the determinism of formulae sought outside the realm of music. Opposed to this was the subjectivity held by Cage and those who directly or indirectly became disciples of Cage. Music as diametrically opposed, or coming from attitudes as different as those of Luc Ferrari and Steve Reich can be assembled under this banner. Luc Ferrari taped natural sounds, such as the ambience of a farm and demanded that it be heard as music. Reich's music appeared to be completely different since it reused motifs culled from traditional music. In both cases, however, it was within the listening subject that the musical phenomenon reputedly occurred. Whether by active listening and a recreative imagination or through the passive impregnation of a musical opiate, the premise and result were the same.

A polarity can therefore be constructed in contemporary music, one which transcends current distinctions. Composers can be regrouped at two poles regardless of their formal differences and their respective schools. On the side of objectivity we have Xenakis, the innovator, as well as Boulez, anachronistic heir of serialism. The music of both of these composers is dependent on preconceived models, or rules imposed, *a priori*, on music. Different motives led to the same point where the victory of

intelligent machines is celebrated over the capriciousness of man. Opposed to this supreme presumption is the equally supreme illusion of having all music occur within the listener. Given any transitory sound or a musical cliché, the listener would create his own music. Here then at the subjective pole is John Cage and those who fled as he did into the stronghold of the subconscious. (See figure 1).

Another polarization exists between the instrumental production of sound and the impression produced in the listener. Within the first instance objective music was opposed to subjective music, in this instance the tangible circumstances of the concert are opposed to those of the sound laboratory. Music is made with equipment, performed in front of people, transmitted in different ways and produces different effects. In traditional music we voluntarily establish an equilibrium between the visual and aural aspects of musical communication. Radio and recordings deprived us of the visible presence of musicians but led us to hear music better. We are rather like the students of Pythagoras who were made to listen with greater concentration because their teacher insisted on lecturing from behind a curtain. This "acousmatic" situation as the Greeks called it, perfectly sums up contemporary listening practice. It applies both to taped or broadcast instrumental music and to electro-acoustic music. The most important names in electro-acoustic music, such as Pierre Henry, were cut off from everything visual at this juncture, and it is not surprising that they attempted to incorporate spoken text into their sound compositions. Their music was heard as one would read a book, rather than as a symphonic performance.

figure 1


objective model
PIERRE BOULEZ
IANNIS XENAKIS
LUCIANO BERIO
"acousmatic" situation
PIERRE HENRY
musical "spectacle"
MAURICIO KAGEL
KARLHEINZ STOCKHAUSEN
contemplative, subjective model
JOHN CAGE

But there remained composers such as Mauricio Kagel who sought to restore the spectacle. Text and meaning were voluntarily abandoned in order to draw material from the absurd and the irrational, an inspiration of gestures, cries, gags. It was a pantomine leading inevitably to "theatre-music". The case of Stockhausen, another key figure, is more complex. Because he was able to justify his work in all points of my compass, he in fact passed at various stages from one to the other. After going "Nordic" by theorizing on electronic music in a serial vein, he passed to an atavistic form of electro-acoustics as in *Hymnen*. Then, after several theatrical "mise en scènes", he found his "Indian summer" -- the way of Asiatic meditation. His contemporary, Berio, on the other hand, was somewhat lighter in his transitions. Through innovative theory he introduced speech into his music in order to arouse the listener who in his turn was grateful for these entertaining sleights of hand.

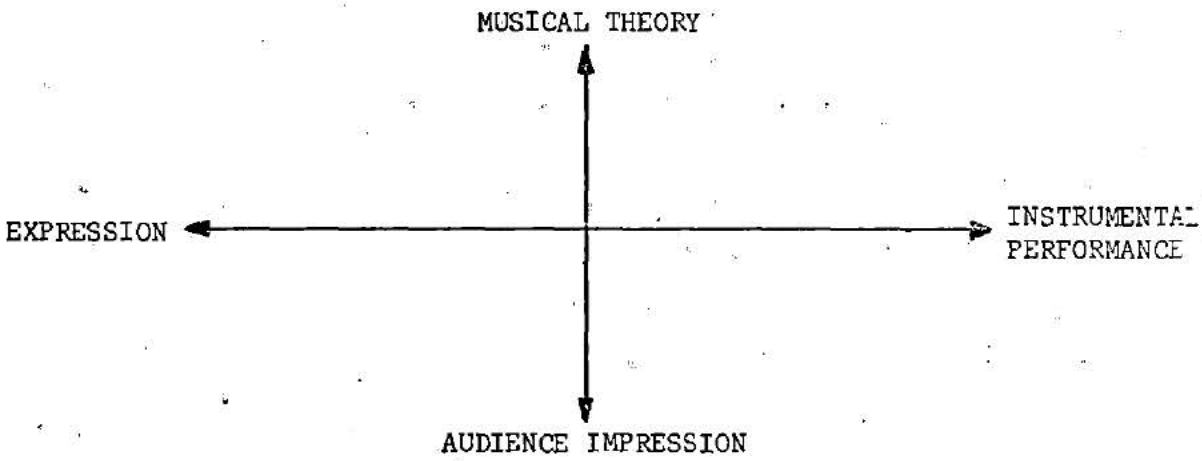
All of these born musicians, born unhappily into these uncertain times, were in perpetual search of the musical. In their search they involuntarily paid homage not only to the innovations of which they prided themselves but to the traditions they despised.

In thus grouping some notable contemporary composers into an interplay of four poles, I abstain from value judgement and even from aesthetic criteria. This diagram of mine, if only approximate, has the merit of showing that contemporary composers, because of their connection to a great or at least harmonious epoch of music, are fatally waylaid and unbalanced by one or other of the four poles. What we must consider now is whether my perspective is only a clever contrivance, a game, or if it does, as I suggest, transcend particularity to be justified as a

fundamental and indeed universal structuring of music.

There have been other eras, of course, which have not suffered the divisiveness described above. It is not, however, that the four cardinal points were not operative during these epochs. On the contrary, they were more clear cut than ever but the compositions were balanced in all four directions. (See figure 2).

figure 2



European music in the eighteenth century for example achieved an evolutionary apogee. On the instrumental side (at the east of my scheme) the pianoforte had entered the realm of available musical instruments. A compromise had been established which concerned instruments and their tuning, as well as theoretical concepts of tuning. Musical theory (at the north) was thus integrated with instrumental practice (at the east). It might be thought that the music of the time barely turned to the other points of expression (west) and impression (south). However we need only pronounce the names Bach, Beethoven, Mozart or Schubert to affirm that

essential aspirations existed, that music was a form of prayer, love, contemplation and exaltation. Technology and theory were in the service of the sublime.

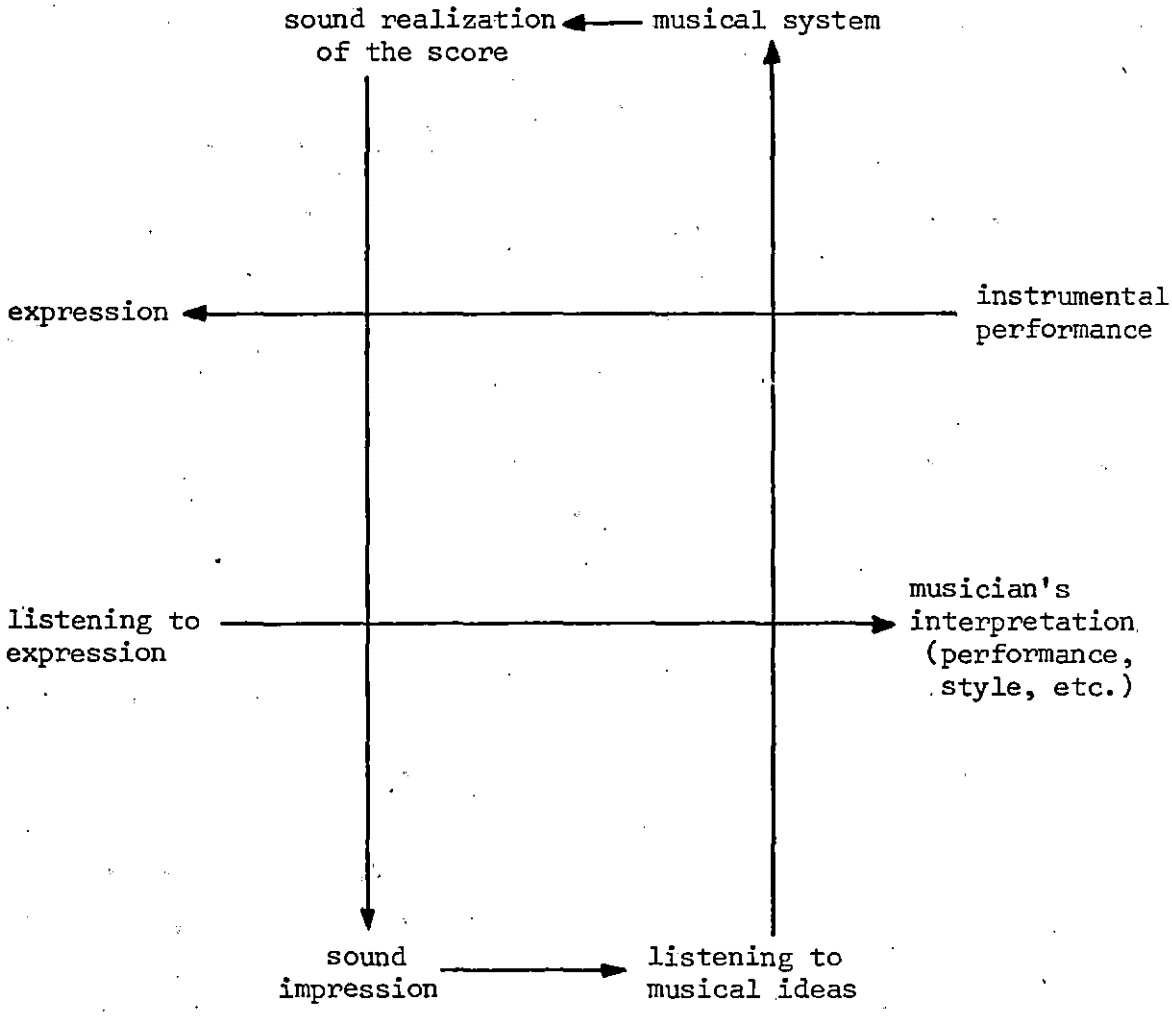
In broad terms, this was the context, without doubt the protagonists were oblivious to their own merits, caught up in the mediocrity of daily existence. From our vantage point, however, it is all very clear. Now, as the situation is reversed, as we are provided with all types of apparatus and theories, encumbered with materials, procedures and pretentions, we have renounced everything, sublimity as well as musical functioning. We are instead making a music which serves nothing other than itself, which is mass produced. It is in this way that it so strongly resembles the contemporary social situation and expresses its most obvious and profound impasses.

To characterize the difference between these two epochs we might say that in the former, happier one, music most closely approximated the activity of the ear which will naturally encompass, with its marvelous agility and omnipresence, all four cardinal points at once. In the latter, the present, the ear is denied this circum-audition.

Let us describe, then, the activity of the ear. Certainly we listen with the eyes, but if we close them the ear is not any less directed towards the east where the sound originates. The ear discerns first of all the familiar instruments, approximately numbers the performers, and isolates the virtuoso by attentive listening. But from what preconceived idea did the ear draw its information? It departed from the sound that it heard in order to go back to the origin of the sound. It is first of all arrested by the expression, and if it is a musician's ear, it would

be sufficiently cognizant of instrumental rules and orchestration to recognize the actual playing or the conductor's interpretations. (See figure 3).

figure 3



TRADITIONAL LISTENING

Virtually simultaneously, the ear abandons this preliminary play of going and returning from the performance to the expression, for another axis, this time from south to north, fixing its attention on content. The concert listener without specialized knowledge would pull himself from simply recognizing the sound to rise to the musicality of the work, that aspect which constitutes its true genius. If he loves Bach or Beethoven he would incessantly consider the mystery of this exchange between himself and the music which is able to affect him. Superficially it seems such a simple process. If the listener is more knowledgeable and can read a score, he would consider the articulation of this language, this astonishing unfolding of expected and unexpected musical events. This process would traverse the south-north axis of my diagram. Without this axis it would not even be possible to discern whether the music was played justly or falsely. If listening was reduced to the absorption of pure sound (south) without the musical system (north), the ear would have no apparatus for critical appreciation.

This last statement illustrates what happens when we listen to music from a foreign culture. We possess neither the key nor the sensibility to appreciate it. The south-north axis doesn't function. In listening to *gagaku*, we are not only incapable of discerning the musician's accuracy, but we are ignorant of corresponding sentiment as well. Similarly we are incapable of discerning whether a particular *raga* is meant for morning or evening, something which would be obvious to Indian listeners. The east-west axis functions somewhat better even if we are uninformed. In this case our eye can help us by interpreting the method of performing exotic instruments. We are easily attracted to the expression inherent in the

manner of performance, even if unable to appreciate it fully.

I cannot enlarge on this system of the four points of listening and on the vigilance of the ear, which has occupied my personal research for so many years. I direct the reader to my book, *Traité des Objets Musicaux*, published ten years ago contrary to popular currents to the extent that it has yet to find an English edition. However numerous people outside France, despite the language problems, have thanked me for having advanced a plausible hypothesis which concerns not only contemporary music but music universally. I will continue this hypothesis without further justification by referring the reader to the above mentioned work.

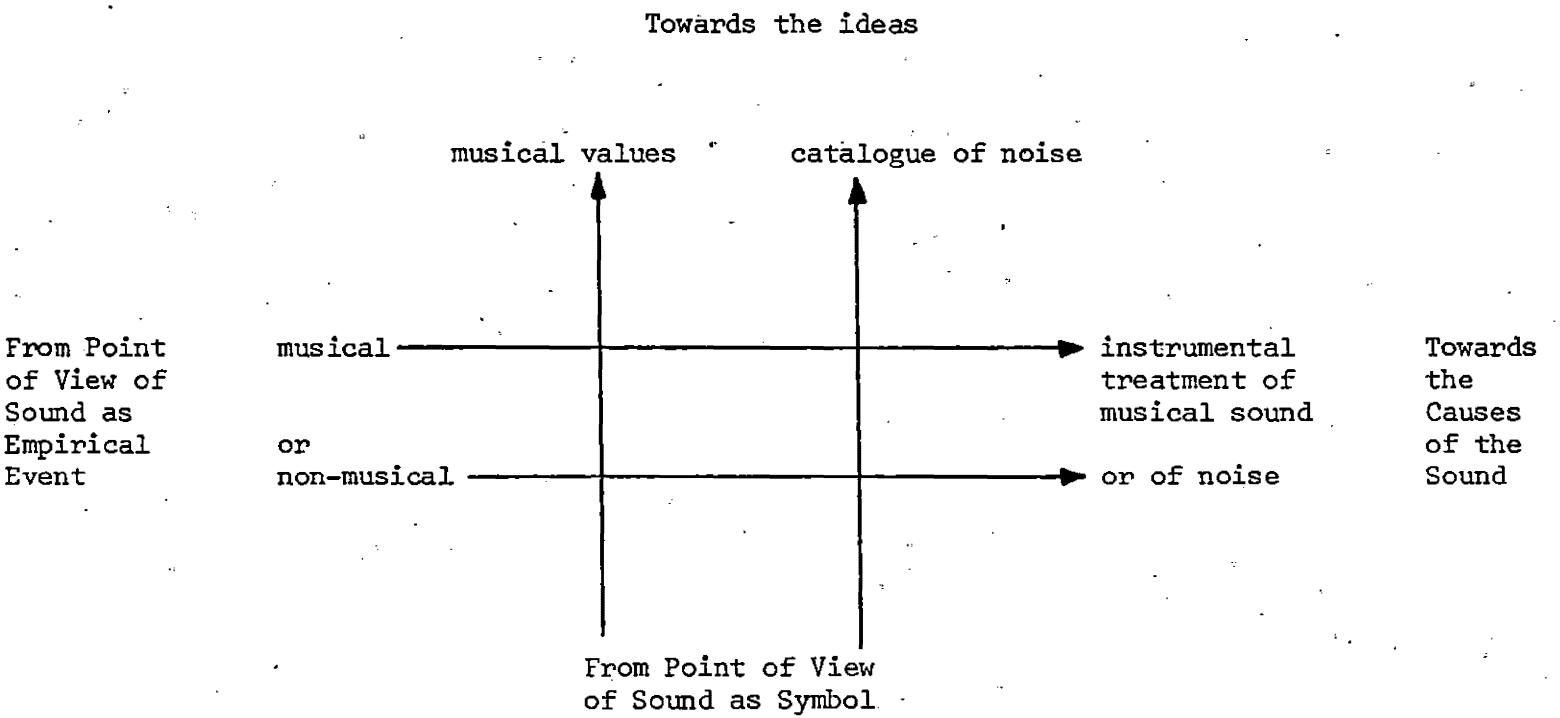
XXX My conclusion is simple enough. Music, unlike language, is a hybrid system relying as much on the natural as the cultural. The natural aspect of music common to all peoples, involves a primordial vigilance which leads us to spontaneously interpret sound, as noise, as a warning, as a cue to exercise caution. The distinction between noise and musical sound is in reality fictitious. A culture invents instruments to make this distinction; if this were fundamental to music, its history would have been entirely subordinated to them -- which it is not. An example will illustrate this. If a cat were to walk across a piano, if a violin is struck inadvertently, I hear musical instruments but without attaching any importance to the sounds that they emit, recognizing only noise. If on the contrary I hear a door which squeaks or a train which I am on passes another train, I would possibly be able to add musical significance to the noise which I hear. The door squeak can be isolated in pitch. The trains which pass each other at great speed create an interval of a third by means of the doppler effect. This dualism is clearly illustraated in

the diagram. The eastern point of the east-west axis represents the instrumental cause of both noise and musical sound. East to west is the emitter-to-receptor direction. But we must, especially in an acousmatic situation, also consider the receptor-to-emitter direction. The investigation thus becomes a double one. As I have demonstrated in my *Traité*, all music contains noise, not in the connotation of disorder, but rather as an ensemble of perfectly organized secondary characteristics. (See figure 4).

Within the south-north axis, sound is taken to be basic or natural and the ideas relegated as cultural; i.e., artificial. This concept is no longer valid. The sound environment is not the same in Rome or Babylon, in New York or Bali, at least in historical times. There is a catalogue of sounds connected to a culture just as there is a catalogue of musical values. As for the musical values themselves, I propose, as have many others, that they contain a foundation common to all musical cultures which holds to natural laws of acoustics, both physical and physiological. The interpretation of sounds will always be hybrid according to an interplay of cultural and natural laws.

When a musical culture undergoes a sudden mutation, as in our day, listening habits are overturned and the listener is simultaneously confronted with a byzantine refinement and a primitive coarseness. A situation which biases and renders listening incomplete. If the mutation surprises the listener with technological novelty as well as uncertain musical patterns he becomes as unequipped to contend with it as he was when confronted with *gagaku* or a *raga*. In fact the situation is even more problematic. Japanese and Indian music at least possess an

figure 4



FOURFOLD POINTS OF MUSICAL AND ORDINARY LISTENING;
DEPARTING FROM SOUND AS SYMBOL, OR SOUND AS EMPIRICAL EVENT

inherent coherence which is the result of a longstanding historical consensus. What can be agreed to about a music which is just being sketched, which vascillates between the four cardinal points? /It is because this is in fact the case that I propose truly experimental music to be antithetical to the current ambition to make original and personal works. I voluntarily assert the non-consequential. When I compose, it ** is with a desire to research rather than to express. I intend to create new inter-relations of sound which will achieve a balance of the four corners of my paradigm. Without this a musical composition will not be understood. And this misunderstanding can be wholly attributed to the failure of the composer to arrive at such a balance./

The layers of this misunderstanding warrant our attention. As was said before, the listener proceeds from sound to sound source. Nowadays he does not find well known instruments, but new sound sources; if the music derives from either electronic music or concrete music, he runs a double risk of losing his bearings. At the times when the sounds are too obvious they become merely anecdotal, a sound landscape. At other times when the sounds are produced by a synthesizer, they constitute an undifferentiated magma, a nameless mixture of sound. Although in theory the synthesizer contains all possible instruments, in practice we somehow miss the presence of any of them. In short, the synthesizer does not live up to its potential of being a "mother" instrument, it is simply a new one.

"ANECDOTAL" LISTENING ⟶ INSTRUMENTAL CAUSES { NATURAL OR ARTIFICAL SOUND INSTRUMENTS, PROCEDURES, ETC.

Of course one can avoid these hazards by a better choice of sound objects or artificial sounds. Ordinary or non-musical listening is still able to discern procedure behind the question of instruments. The ear is sufficiently perceptive to discover montage, filtering, and most of the already classic repertoire of electronic composition. The division between electronic and *concrete* music is not decisive; but the one between too much information and not enough, the arbitrariness of montage and the redundancy of automaticism, is. The ear, capable of so much, is overwhelmed and bored. It refuses to accept what it is given as musical. While the composer may wish to introduce a south-north trajectory, the listener remains the prisoner of the east-to-west.

"TECHNICAL" LISTENING ⟶ THE SOUND FLUX { ALEATORIC / PREDETERMINED

Sometimes he may reach the south-to-north trajectory, but not always as the composer intended. He may, although denied what he desires and without joining the composer on his wavelength, actually agree with him that some passage is efficacious or that some articulation is convincing. Without knowing why, he is content to murmur: "that works".

"that works"
but why
?

When something "works" we have gained both insight and avoided the two usual errors of lack or excess of musical ideas. There is an excess of musical ideas when this experimental music, desiring novelty, returns to outmoded or irrelevant models. It might, for example, employ some musical folklore, e.g., a modulation in the minor mode. When the

composition cannot be extricated from sound events, it is void of musical ideas.

To compose is to push music blindly forward in the search for a path amongst fearful obstacles. At times the route to the future deadends, and at others it becomes mired in the past. In the stabilized world of western music in the eighteenth century it was possible to speak of schools and aesthetics. But in order to compare (classicism and baroque, impressionism and romanticism)we need a common language. We no longer have one and there is no stability; aesthetic differentiations which yesterday appeared to be important have today disappeared into a paradoxical uniformity, that of cacophony.

"Cacophony" is a Greek substitute for the word 'misunderstood'. And in this context both stand for an epistemological blockage between the composer and the listener. The composer can, of course, hear his own work in the north-to-south and east-to-west directions. The listener, not privy to the composer's intent, has only the resultant sound and must retrace in the opposite direction (south-to-north and west-to-east) by grasping both how it is made and what it is trying to say. The process is analogous to the experience of being confronted with a foreign language. A foreigner speaks to you in his language and you translate his statement into your own; what is a statement for one is a translation for another. Yet it is necessary that these languages be connected and convertible.

If music were a language, as is often suggested, it would never have been invented. It would have evolved, but only slowly and slightly. In certain epochs, although music cannot be reduced to language patterns, it

does mirror them, allowing a culture to express as many original statements as there are works.

At other times the system is worn, it destroys itself and is pushed aside by an influx of material, as occurred in the middle of this century with the "electro-acoustic irruption". It is, therefore, enormously naive to believe that, in the near future, musical compositions will be viable and that the social function of musical communication will be fulfilled. It is false to say that a composer expresses himself or that he serves a public. If he is authentic, his work will embody cacophony, and he can hardly pretend anything else. He addresses his cleverness to himself through the sounds that he arranges. He could pretend in order to further his reputation that he had in fact composed a major work, one of relevance to the fibre of contemporary culture. He may even become popular, temporarily at any rate. But in the last analysis it is only the composer, and maybe some rare initiates who, if sincere, would be able to tell whether or not the experiment succeeded or failed, whether or not cacophony had been transcended. The least sign is thus full of promise, the least success, best recognized in the privacy of the conscience, portends the future. Time must pass before new structures can be elaborated and tested against the natural laws of sound and the consensus of society. It is apparent that composition is now not so much a question of communication between individuals but an occult correspondence between man and the cosmos, at once private and universal.

In science a great mind will forge a narrow inroad into the expanse of the unknown, revealing nature's secrets and making them accessible to our intelligence. But in music the inverse prevails. A discovery leads

not so much into the intellect, a relatively well mapped domain, but into the inner realities of man. It is a more profound realization which can be known only in a collective manifestation.

It is this which explains the paradoxical success of contemporary music on its limited public. It is not satisfying present needs; but the stakes are so high that people wish to participate by gambling on some player. Human perserverance is astonishing. Music guards its secrets well and husbands an enigma for which we continue to be insatiable. We stand in anticipation, waiting for the long shot. However, there is no reason to believe, in spite of our hopefulness, that we shall experience this satisfaction, even in the distant future.

/ Contemporary man, however, believes in continual progress and perpetual change. This is infinitely naive. In the century of Hiroshima there has been only one change and it has overshadowed everything else; atomic fission. For music to become an agent in this world of destruction and power it must accept the risks of radical experimentation./

*

BIBLIOGRAPHY

I. Reference Materials

Basart, Ann Philips. *Serial Music: A Classified Bibliography on Twelve Tone and Electronic Music.* California, 1961.

Cross, Lowell M. *A Bibliography of Electronic Music.* Toronto, 1967.

Davies, Hugh. "A Discography of Electronic Music and Music Concrete." *Recorded Sound,* vol. 14 (April, 1964): 205.

_____. *International Electronic Music Catalogue.* Cambridge, Massachusetts, 1968.

II. Books

Appleton, John and Ron Perera, ed. *The Development and Practice of Electronic Music.* New Jersey, 1975.

Beckwith, John and Udo Kasemets, ed. *The Modern Composer and His World.* Toronto, 1961.

Busoni, Ferrucio. *The Essence of Music and Other Essays.* New York, 1957.

_____. *Sketch of a New Aesthetic of Music.* New York, 1962.

Cage, John. *Notations.* New York, 1969.

_____. *Silence.* Wesleyan University Press, 1961.

_____. *A Year From Monday.* Wesleyan University Press, 1967.

Carlos Chavez. *Towards a New Music.* New York, 1937.

Cohn, Arthur. *Twentieth Century Music in Western Europe.* Philadelphia, 1965.

Deutsch, Herbert F. *Synthesis, An Introduction to the History, Theory, and Practice of Electronic Music.* New York, 1965.

Dibelius, Ulrich. *Moderne Musik 1945-1965. Vorgaussetzungen, Verlauf, Material.* Munich, 1966.

Hauserm, Josef. *Musik im 20. Jahrhundert von Schoenberg zu Pendereçki.* Bremen, 1969.

Helmholtz, Hermann L.F. *On the Sensations of a Tone as a Physiological Basis For the Theory of Music.* trans. Alexander J. Ellis. New York, 1948.

Judd, F.C. *Electronic Music and Musique Concrete.* London, 1961.

Kostelanetz, Richard, ed. *John Cage.* New York, 1970.

Lang, Paul Henry, ed. *Problems of Modern Music.* New York, 1962.

Messiaen, Oliver. *Technique de mon Langue Musical.* Paris, 1944.

Meyer, Leonard B. *Music, the Arts and Ideas: Patterns and Predictions in Twentieth Century Music Culture.* Chicago, 1967.

Meyer-Eppler, Werner. *Elektrische Klangerzeugung. Elektronische Musik und Syntheische Sprache.* Bonn, 1949.

Nyman, Michael. *Experimental Music: Cage and Beyond.* London, 1974.

Prieberg, F.K. *Musica ex Machina.* Vienna, 1960.

Russcol, Herbert. *The Liberation of Sound: An Introduction to Electronic Music.* Englewood Cliffs, New Jersey, 1972.

Schaeffer, Pierre. *A la Recherche d'une Musique Concrète.* Paris: Editions du Seuil, 1952.

_____. *Machines à Communiquer,* vol. I. Paris, 1970.

_____. *Machines à Communiquer,* vol. II. Paris, 1972.

_____. *La Musique Concrète. Que Sais-je?* Paris, 1967.

_____. *Solfège de l'Objet Sonore.* Paris, 1967. Presentation with recorded examples to accompany *Traité des Objets Musicaux.*

_____. *Traité des Objets Musicaux.* Paris, 1966.

_____, ed. *De l' Experience Musicale à l'Experience Humaine.* Special edition of *La Revue Musicale,* vol. 274-275. Paris, 1971.

_____, ed. *Experiences Musicales.* Special edition of *La Revue Musicale,* vol. 244. Paris, 1959.

_____, ed. *Vers une Musique Experimentale.* Special Edition of *La Revue Musicale,* vol. 236. Paris, 1957.

Pierre Schaeffer. De la Musique Concrète à la Musique Meme. Special collected edition of the writings of Pierre Schaeffer in *La Revue Musicale,* vol. 303-304-305. ed. and annotated by Sophie Brunet. Paris, 1977.

Schwartz, Elliot and Barney Childs, ed. *Contemporary Composers on Contemporary Music.* New York, 1967.

Schwartz, Elliot. *Electronic Music, A Listener's Guide*. New York, 1975.

Stuckenschmidt, H.H. *Twentieth Century Music*. trans. George Widenfeld. New York, 1969.

Strange, Alan. *Electronic Music, Systems, Techniques, and Controls*. Iowa, 1972.

The Technical Facilities of the Electronic Music Studio of the Cologne Broadcasting Station. trans. D.A. Sinclair. Ottawa NRC, Technical Translation TT 601-TT612, 1956.

Tryhall, George. *Electronic Music*. New York, 1974.

III. Periodical Literature

Adorno, Theodor W. "Das Altern der Neuen Musik," *Der Monat: Eine Internationale Zeitschrift*, vol. 80 (May, 1955): 150.

Anhalt, Istvan. "Varèse," *Canadian Music Journal*, vol. 2 (1961):64.

Ansermet, Ernest. "L'Experience Musicale et le Monde d'Aujourd'hui," *Ecrits sur la Musique*. ed. J-Claude Piguet. Neuchatel, Switzerland, 1971.

Appleton, Jon. "Additive vs. Subtractive Synthesis," *Electronic Music Review* (January, 1968).

_____: "Aesthetic Direction in Electronic Music," *Western Humanities Review*, vol. 18 (Autumn, 1964): 345.

_____. "New Role for the Composer," *Music Journal*, vol. 27 (March, 1969): 28.

_____. "Tone Relation, Time Displacement and Timbre -- An Approach to Twentieth Century Music," *Music Review*, vol. 27 (Autumn, 1966): 54.

"The Art of the Telharmony," editorial in *Electrical World*, vol. 47, 10 (March 10, 1906): 509.

Auden, W.H. "Writing," *The Poet's Work: 29 Masters of 20th Century Poetry on The Origins and Practice of Their Art*. ed. Reginald Gibbons (Boston, 1979): 240.

Babbitt, Milton. "An Introduction to the R.C.A. Synthesizer," *Journal of Music Theory*, (Winter, 1964): 251.

_____. "The Revolution in Sound," *Music Journal*, vol.18,7 (October, 1960): 34.

_____. "Some Aspects of Twelve Tone Composition," *Score*, vol. 12 (June, 1955): 55.

_____. "Twelve Tone Rhythmic Structure and the Electronic Medium," *Perspectives of New Music*, vol. 1 (Fall, 1962).

_____. "Who Cares if You Listen?" *High Fidelity*, vol. 8 (February, 1958): 38.

Berio, Luciano. "The Studio di Fonologia Musicale of the Milan Radio," *Score*, vol. 15 (March, 1956): 83.

Bakus, John. "Die Reihe -- A Scientific Evaluation," *Perspectives of New Music*, vol. 1 (Fall, 1963): 160.

Baker, Ray Stannard. "New Music for an Old World: Dr. Thaddeus Cahill's Dynamorphone an Extraordinary Invention for Producing Scientifically Perfect Music," *McClures Magazine*, vol. 27,3 (July, 1906): 291.

Beeson, Jack. "Otto Luening," *Bulletin of the American Composer's Alliance*, vol. 3 (Autumn, 1953): 2.

Boulez, Pierre. " 'At the End of Fruitful Lands...' " *Die Reihe*, vol. 1. Pennsylvania, 1958. Original publication of *Die Reihe*, vol. 1 in German; Vienna, 1955.

Brown, Clement. "How to Make Electronic Music," *Popular Science*, vol. 126 (April, 1960): 184.

Brown, Earle. "Form in New Music," *Source*, vol. 1: 48

Canby, E.T. "Electronic Music Styles," *Audio*, vol. 53 (October, 1969): 34.

Cowell, Henry. "Composing With Tape," *Hi-Fi Music at Home*, vol. 2 (January-February, 1956): 23.

_____. "The Music of Edgard Varèse," *Modern Music*, vol. 5,2 (1928): 9.

Cross, Lowell. "Electronic Music 1948-1953," *Perspectives of New Music*, vol. 7 (Fall, 1968): 32.

De la Vega, Aurelio. "Electronic Music, Tool of Creativity," *Music Journal*, vol. 23 (September, 1965): 52.

_____. "Regarding Electronic Music," *Tempo*, vol. 75 (Winter, 1965-66): 2.

Dennis, B. "Metamorphosis in Modern Culture, the Parallel Evolution of Music and Painting in Twentieth Century Culture," *Tempo*, vol. 78 (Autumn, 1966): 12.

Feldman, Morton. "Between Categories," *Composer (U.S.)*, vol. 1 (1969): 73.

_____. "Pre-determinant/Indeterminant," *Composer*, vol. 19 (1967): 19.

Forte, Allen. "Composing with Electronics in Cologne," *High Fidelity*, vol. 6 (October, 1966): 64.

Gerhardt, Roberto. "Concrete and Electronic Sound Composition," *Music Libraries and Instruments*. London, 1961.

Golea, Antoine. "French Music since 1945," *Musical Quarterly*, vol. 51 (January, 1965): 22.

Hamilton, Donald. "A Synoptic View of New Music," *High Fidelity*, vol. 18 (September, 1968): 44.

Jeanneret-Gris, Charles Edouard (Le Corbusier). "The Phillips Pavilion and the Electronic Poem," *Art and Architecture*, vol. 75 (November [illegible], 1958): 23.

Judd, F.C. "The Composition of Electronic Music," *Audio and Record Review*, vol. 1 (November, 1961): 78.

Keller, H. "The Contemporary Problem," *Tempo*, vol. 89 (Summer, 1969): [illegible].

Klein, L. "Twentieth Century Analysis: Essay in Miniature," *Music Educator's Journal*, vol. 4 (1966): 63.

Krenek, Ernst. "Is the Twelve Note Technique on the Decline?" *Musical Quarterly*, vol. 39, 4 (October, 1953): 513.

_____. "New Developments in Twelve Tone Technique," *Music Review*, vol. 4,2 (May, 1943): 81.

Lawrence, H. "Music Criticism in the Electronic Age," *Audio*, vol. 44 (October, 1960): 78.

Lesure, Francois. "Debussy at Edgard Varese," *Debussy et l'Evolution*. Paris, 1965.

Luening, Otto. "Some Random Remarks About Electronic Music," *Journal of Music Theory*, vol. 8 (Spring, 1964): 89.

_____. "An Unfinished History of Electronic Music," *Music Educator's Journal*, vol. 8 (November, 1968): 42.

Malec, Ivo. "Musique Concrète 1948-1968," *Melos*, vol. 36 (February, 1969): 53.

Marcel, Luc-André. "Arnold Schoenberg," *Cahiers du Sud*, vol. 24 (2 Semestre, 1951): 130.

Nyman, Michael. "Fluxus and the Experimental Music Tradition," *Art and Artists*, vol. 7,7 (October, 1972): 44.

_____. "Interview with Steven Reich," *Musical Times*, vol. 112 (March, 1971): 229.

Pol, G. "A Galaxy of Space Music," *Musical Journal*, vol. 27 (January, 1969) : 48.

Potter, Ralph K. "New Scientific Tools for the Arts," *Journal of Aesthetics and Art Criticism*, vol. 10,2 (December, 1951): 126.

Powell, Mel. "Electronic Music and Musical Newness," *The American Scholar*, vol. 35,2 (Spring, 1966): 290.

Pousseur, Henri. "Calculation and Imagination in Electronic Music," *Electronic Music Review*, vol. 5 (January, 1968): 21.

Reynolds, R. "Indeterminacy: Some Considerations," *Perspectives of New Music*, vol. 4 (1965): 136.

Ruwet, Nicolas. "Contradictions du Langue Sériel," *Revue Belge de Musicologie*, vol. 13. Brussels, 1959: 1.

Salzman, Eric. "Music From the Electronic Universe," *High Fidelity*, vol. 15 (August, 1964): 54.

Schaeffer, Myron. "The Electronic Music Studio of The University of Toronto," *Journal of Music Theory*, vol. 7,1 (Spring, 1963): 73.

Schaeffer, Pierre. "Anamorphoses entre Musique et Acoustiques," *Gravesaner Blatter*, vol. 17. Mainz, 1960.

_____. "Introduction à la Musique Concrète," *Polyphonie* vol. 6 (1950): 306.

_____. "La Musique Concrète," *La Vie Musicale*, vol. 1 (July-August, 1951): 8.

_____. "La Musique Concrete," *Journal de la Musique Française*, vol. 1 (December, 1968): 38.

_____. "Musique Concrète et Connaissance de l'Objet Musical," *Revue Belge de Musicologie*, vol. 13. Brussels, 1959: 62.

_____. "La Musique Ecartelée," published as "Sound and the Century: A Socio-Aesthetic Treatise," trans. with introduction by Donna Zapf, *Vanguard*, vol. 9,1 (February, 1980): 6.

_____. "La Pensée Encombrée," *Prospective*, vol.15. Paris, 1963.

_____. "La Sévère Mission de la Musique," *Revue d'Esthetique* (April, 1968). This was the result of a conference held in January, 1968.

_____. "Sous le Divan la Rue," *Etudes Psychotherapiques*, vol. 33 (September, 1978).

_____. "Spectacle et Information," *Preuves*, vol. 196 (June, 1967).

_____. "Le Triangle et la Communication," *Preuves*, vol. 212 (December, 1967).

Schiffer, Brigitte. "Darmstadt: Citidel of the Avant Garde," *The World of Music*. vol. 11,3 (1969): 32.

Schuller, Gunther. "Conversations with Varèse," *Perspectives of New Music*, vol. 3,2 (1965): 32.

_____. "The New German Music for Radio," *Saturday Review*, vol. 45 (January 13, 1962): 62.

Stockhausen, Karlheinz. "The Concept of Unity in Electronic Music," *Perspectives of New Music*, vol. 1,1 (1962): 39.

_____. "Electronic and Instrumental Music," *Die Reihe*, vol. 5. Pennsylvania, 1961.

Tallmadge, William H. "The Composer's Machine," *Journal of Aesthetics and Art Criticism*, vol. 19,3 (Spring, 1961): 339.

Ussachevsky, Vladimir. "As Europe Takes to Tape," *American Composer's Alliance Bulletin*, vol. 3.3 (1953).

_____. "Columbia-Princeton Electronic Music Centre," *Revue Belge de Musicologie*, vol. 13. Brussels, 1959: 129.

_____. "Music in the Tape Medium," *Revue Belge de Musicologie*, vol. 13. Brussels, 1959: 129.

_____. "The Process of Electronic Music," *Journal of the Audio Engineering Society*, vol. 6 (July, 1958): 202.

Valéry, Paul. "L'Homme et la Coquille," *La Nouvelle Revue Française* (February 1, 1937). Reprinted as "Man and the Seashell," trans. Ralph Manheim. *Paul Valery, An Anthology*. Princeton University Press, 1956.

_____. "Poésie et Pensée Abstraite," was delivered as the Zaharoff Lecture at Oxford, March 1, 1938 and was published by Clarendon Press, 1939. Reprinted as "Poetry and Abstract Thought," trans. Denise Folliot. *Paul Valery, An Anthology*. Princeton University Press, 1956.

Varese, Edgard. "A Communication," *Musical Quarterly*, vol. 45 (1955):54.

_____. "Les Instruments de Musiques et la Machine Electronique," *L'Age Nouveau*, vol. 92 (May, 1955): 28.

_____. "Musik auf Neuen Wegen," *Stimmen*, vol. 15 (1949): 401.

_____. "Organized Sound for the Sound Film," *Commonweal*, vol. 33 (1949): 204.

Waterhouse, J.C. "A Futurist Mystery," *Music and Musicians*, vol. 15 (April, 1967): 26

_____. "Music and Noise," *Music and Musicians*, vol. 14 (January, 1966): 28.

Wen-Chung, Chou. "Varese: A Sketch of the Man and His Music," *Musical Quarterly*, vol. 52 (April, 1966): 151.

Xenakis, Yannis. "The Origins of Stochastic Music," *Tempo*, vol. 88,9 (Autumn, 1966): 8.

Zinovieff, P. "Electronic Salutes Concrete," *Music and Musicians*, vol. 17 (March, 1969): 30.

VITA

Surname: Zapf Given Names: Donna Doris-Anne

Place of Birth: Victoria, B.C. Date of Birth: October 24, 1950

Educational Institutions Attended, with Dates of Entering and Leaving:

University of Victoria 1969 to 1973

University of Victoria 1975 to 1980

____ to ____

____ to ____

Degrees, Diplomas, Etc., Awarded with Dates and Names of Institutions:

B.Mus	1973	University of Victoria

Honors and Awards:

Harbord Entrance Scholarship in Music, 1969

Harold Beckwith Memorial Book Prize in Music, 1973

University of Victoria Fellowship, 1975/76

University of Victoria Fellowship, 1976/77

Canada Council M.A. Scholarship in the Humanities, 1973 (declined)

Commonwealth Scholarship for Doctoral Studies in Musicology, 1977 (declined)

Publications:

Pierre Schaeffer. "Sound and the Century - A Socio-Aesthetic Treatise". trans. with introduction by Donna Zapf. Vanguard , vol.9, no.1. (February, 1980)

PARTIAL COPYRIGHT LICENSE

I hereby grant the right to lend my thesis or dissertation (the title of which is shown below) to users of the University of Victoria Library, and to make single copies only for such users or in response to a request from the library of any other university, or similar institution, on its behalf or for one of its users. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by me or a member of the University designated by me, with the understanding that I will be informed of such copying. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Title of Thesis/Disseration

Musique Concrète

A Translation and Analysis of Two Essays of Pierre Schaeffer

L'Experience Concrète en Musique

La Musique Ecartelée

Author [redacted]