Sound and the Century a Socio-Aesthetic Treatise Pierre Schaeffer

Translated and introduced by Donna Zapf

The first decades of the 20th Century witnessed a proliferation of technological advances concerned with sound and sound transmission as well as a fecund atmosphere for innovation in music. The *possibility* for electro-acoustic music has existed from this time. But in fact technology served the artistic-social status quo while musical innovation pursued a separate course. Speculation on the possibilities of electronics in music has dogged the decline of the predominating musical currency inherited from the 19th Century. There is, however, no single evolutionary trajectory which traces the development of electro-acoustic music from the turn of the 20th Century to present day computer sophistication. French composer, writer, critic and journalist, Pierre Schaeffer offers his own synthesizing view of the consequences of this evolution in the essay which follows. It is, of course, an evolution in which Schaeffer has played no small part himself. This introduction sets the stage for Pierre Schaeffer with historical background and contexts.

Early inventions of sound producing electronic devices were applied to music in a manner that conformed completely to a conservative conception of music: the "high art" of music which encompassed standard concert fare, conventional instrumental sound, and the musical syntax of the 19th Century. In 1906, *Maclure's Magazine* in New York published an article about what in effect was the world's first sound synthesizer. The article was entitled "New Music for an Old World; Dr. Thaddeus Cahill's Dynamophone, an extraordinary invention for producing scientifically perfect music." Cahill's invention, the dynamophone or telharmonium, was a gargantuan instrument weighing two hundred tons. Constructed in New York City, auspiciously near to the Metropolitan Opera House, it was sixty feet long, and its 145 inductor alternators which produced different pitches, sat on a bed of eighteen-inch steel girders mounted on brick piers. This sound generating engine was connected to a keyboard in another room where a performer pressing keys and opening organ-like stops would activate circuits to create electrical currents which could be transmitted by wire and made audible by means of a loudspeaker or a telephone receiver. There was no question, however, of the telharmonium exploring sound possibilities. It was idealistically considered to be a means of democratizing music, of bringing music to the homes of people, as simply as installing a telephone. In light of the fact that its installation cost 200,000 dollars in 1906, in practice it must have been thought of in terms of being a good investment as a possible new utility. The central sound station could supply approximately 5,000 customers, restaurants, theatres, concert halls, department stores and perhaps some wealthy individuals who could afford a novelty. It was in fact a herald of mass media rather than musical development. In retrospect the accolades read like prescient plugs for muzak:

> Connecting with the central plant, cables are laid in the streets from which wires may be run into your house or mine, or into restaurants, theaters, churches, schools, or wherever music is desired ...Of course the same selection performed by the musicians go over the wires at the same time so that you and I may sit in our homes on Easter morning and hear the same music that is being produced in the churches, or in the evening, dining at the restaurant we may enjoy the identical selections given in the opera house or the theatre. It is the dream of the inventor that in the future we may be awakened by appropriate music in the morning and go to bed at night with lullabies — sleep music being a department of musical composition which he thinks has been sadly neglected.[1]

We can look with similar incredulity at the development of other musical electronic devices. In 1920, Leon Theremin, a student in Petrograd demonstrated a musical instrument which came to be called the aetherophone or the theremin. The pitch and volume of the instrument were determined by the proximity of the performer's hand to antennae. Demonstrations of the theramin roused great interest throughout the '20s. In Paris, police were necessary to control the crowds who thronged the Paris Opera to witness the new instrument. Standing room was sold in the boxes for the first time in history. Theremin set up a studio and laboratory in Manhattan in 1927, and the following year performed with the New York Philharmonic with great success. Before returning to Russia, Theremin developed other electronic devices such as the Terpsitone, a dance platform installed with sound producing antennae responsive to the movement of a dancer, a keyboard electronic tympani, and a keyboard controlled complex rhythm generator, Theremin also worked with Edgard Varese in developing two electronic instruments for Varese's composition *Ecuatorial*. The single most important proponent of Theremin's spatially controlled aetherophone was a Russian concert violinist, Clara Rockmore, who devoted her life to developing a performance technique on the new instrument. It is of major importance when sketching the measure of musical innovation that accompanied the electronic inventions, that Rockmore used the violin-like tone of the aetherophone to perform a repertoire of Wieniawski, Tchaikovsky, and Rachmaninoff.

Electronic music then was simply traditional music produced with electricity. Simultaneously, however there existed true experimentation with sound. Many composers pushed beyond the conventional musical syntax: Schoenberg, Henry Cowell, John Cage as early as the 30s and Ferrucio Busoni; or the lesser known Alois Haba, as well, who composed with micro-intervals, dividing the octave into more than the twelve segments prescribed in the western musical system.

Astonishing in retrospect among artists concerned with musical innovation/ rennovation was the Italian futurist painter, Luigi Russolo. He was the first to espouse a concept of what in actuality was 'sonic art' rather than 'music' in the currency of the first decades of the century. His premises were based on the belief that all sound, the entire aural surface of life should rightfully form the material for a music. Russolo sketched a theory of noise, defining six families of noise of the futurist orchestra. He demanded an infinite variety of timbre and a liberation of rhythm, and he recognized that for noise to become primary material for creation it must be abstracted from its source. His instruments the intonarumori or noise-intoners consisted of motors and sound producing mechanical devices housed in wooden boxes with funnel shaped megaphones attached. The intonarumori orchestra performed at Marinetti's Casa Rossa in Milan, August 11, 1913, and at the Coliseum in London, June 15, 1914. Russolo's piece from *The Net of Noise*, "The Awakening of a City" performed in London, called for an orchestra of ululatori, rombatori, crepitatori, stroppiccitiatori, ronratori, gorgoliatori and crepitatori (howler, roarer, cracker, rubber, exploder, buzzer, bubbler and hisser). The score itself was graphically notated with rhythm delineated proportionately, and had the appearance of musical scores composed with great frequency in the 50s and 60s. Perhaps of greatest import, Russolo recognized the necessity of developing a technology of sound to meet his ideas.

About the same time that Russolo was stag-

ing futurist concerts throughout Europe, Edgard Varese was seeking new means of expressing compositional thought.

> Our musical alphabet must be enriched. We also need new instruments badly...In my own words I have always felt the need of new mediums of expression...which can lend themselves to every expression of thought and can keep up with my thought.[2]

Six years later in 1922 he was to write:

> What we want is an instrument that will give us a continuous sound at any pitch. The composer and the electrician will have to labor to get it...Speed and synthesis are characteristics of our own epoch. We need twentieth century instruments to help us realize them in music.[3]

Varese thought of sound as living matter; his musical theory speaks of the interaction of sound masses in space and their transmutation as they penetrate each other. He explored the extreme instrumental registers and employed registral characteristics in creating different sound masses. Percussion became integral to his composition rather than peripherally describing the rhythm of a composition. His conception of form was that it was like crystallization in an organic process, "the consequence of the interaction of attractive and repulsive forces evolving out of an idea." Form then was a resultant not a pre-established mold. Throughout the 30s Varese sought out scientists — hopeful of finding means to realize his compositional directions. In an explanation of an almost complete cessation of composition after *Ionization* (premiered in 1933) Varese outlines a hostile attitude to new music in the U.S. as well as his inability to find support for his search for a new means of sound production.

> "...the frustration of having my music ignored was only a part of it. I had an obsession: a new instrument that would free music from the tempered system. Having been closely associated with scientists of the Bell Laboratories, with Bertrand, the inventor of one of the first electronic instruments, and with Theremin, who made two electronic instruments for my *Ecuatorial*, I knew what the possibilities were. I wanted to work with an electrical engineer in a well-equipped laboratory. Individual scientists became interested in my idea but their companies did not, I tried here and in Hollywood but no doors opened.[4]

Varese's use of sound in his composition throughout his artistic life foreshadowed compositional ideas associated with electronic music. More far-reaching than Russolo's iconoclastic demands for new instruments, Varese dreamt "of instruments obedient to (his) thoughts and which...would lend themselves to the exigencies of (his) inner rhythm."[5] Perhaps if Varese had found scientific collaboration the musical results would have been profound. The irony is that the technology was available; a major corporation such as the Radio Corporation of America for example attempted to promote a 'thereminvox' as an instant music-maker — anyone who can whistle can play. That Varese did not find access to a sound studio until very late in his life is integral to a consideration of electronic music prior to 1950.

In fact by the 50s when real and widespread experimentation and composition was in effect in studios in Paris, Cologne, Milan, New York, Tokyo and Toronto, music had long since changed irrevocably. It was not that a point-of-no-return could be geographically located on a temporal map of the first half of the century, but that a composite of technological change combined with the collective creative force of musicians and artists intent on a new art from sound had cleared the landscape of residues of 19th century art. The 'revolution' of the 50s was in reality the times finally catching up to the sounds and the ideas.

The musical situation after WWII was unique. Musical developments through the war had been isolated, ignored, or as in the case of Nazi occupied Europe, repressed altogether under a *kulturpolitik*. In 1946, a series of summer seminars in new music, The International *Ferienkurse Fur Neue Musik* were instituted at Darmstadt, Germany to demonstrate to a generation of young German composers, the changes and developments in music forbidden them by Nazi policy.

In a very real sense Darmstadt served as a matrix for the post 50s musical *avant garde* in that for a period it served as an exchange house of musical ideas. The neo-classicism of Hindemith and Stravinsky was quickly overtaken by more advanced thinking. In 1947, René Leibowitz, a composer who had studied with Anton Webern, taught at Darmstadt as did Edgard Varese in 1950. By 1955, all the main protaganists at the front of musical experimentation were in some brief way involved in the sessions, from Olivier Messaien to John Cage and David Tuder. As well, the primary currents that delineate the early years of electronic music found discussion and audience at Darmstadt. The adoption of serialism to the electronic medium, a procedure that completely defined the first compositions of the Cologne studio can be traced through the Leibowitz lectures to Messaien, Boulez and Stockhausen at the Darmstadt sessions. Werner-Meyer Eppler, a phoneticist at the University of Bonn, who with Herbert Eimert was of major importance in the establishment of the electronic music in Cologne, lectured on the possibilities of electronic sound production. Similarly in 1951, Pierre Schaeffer demonstrated *musique concrete* and young composers such as Stockhausen, Boulez and Philippot came to work at the Paris studio.

Pierre Schaeffer began his work in the field of electro-acoustic music in 1948 at the studios of the French radio in Paris. His original impulses in the field related more to his background in journalism, radiophonics and as a professional writer than to musical sources. In an early chronicle of his first years of research (1948-49), *A La Rescherche D'Une Musique Concrète* (Editions du Seuil, 1953) he tells the anecdote of being moved by the conflict of nature and the machine, expressed by the presence of a ski-lift in a wilderness setting. The conflict which he perceived appeared to Schaeffer to demand more than verbal description.

Schaeffer's early experiments involved the collection and electronic alteration of sound. Sounds were recorded onto record discs, isolated and manipulated. Experiments along these lines involved reversing sounds, cutting off their initial attack, compensating for natural sound decay by increasing the volume. In a composition *Etude au Chemins du Fer* train sounds recorded at 78 rpm were played back at 33 rpm, producing a sound which Schaeffer described as transforming the element 'train' into 'foundry' or 'blast furnace'. If two or three different turntables were used at one time, canons or other polyphonic forms could be simulated. After the introduction of the tape recorder in 1950, more sophisticated compositional means became available in that the actual tape could be cut and spliced resulting in a final montage. Schaeffer called this experimentation on the sound *musique concrète*, or music whose material of construction was real or concrete sounds, as opposed to abstract music, where the original composition is represented by an abstract score, which must be realized by performers. A defining aspect of Schaeffer's work at this time which distinguished him dramatically from the composers centred in Cologne was that his catalogue of sound was acoustic in origin.

The perspective of Schaeffer's essay presumes an *a priori* knowledge of the musical situation at mid-century. The difference between Paris and Cologne studios was an important distinction at this time. Composers in Cologne muddled serialism with acoustic theory and a fetish for sine waves (a basic wave shape) arriving at a compositional process in which timbres were constructed by serially organizing layers of sine waves to produce different sounds. Schaeffer's empirical approach, beginning with acoustic sound, involved theory as it arose from the process itself.

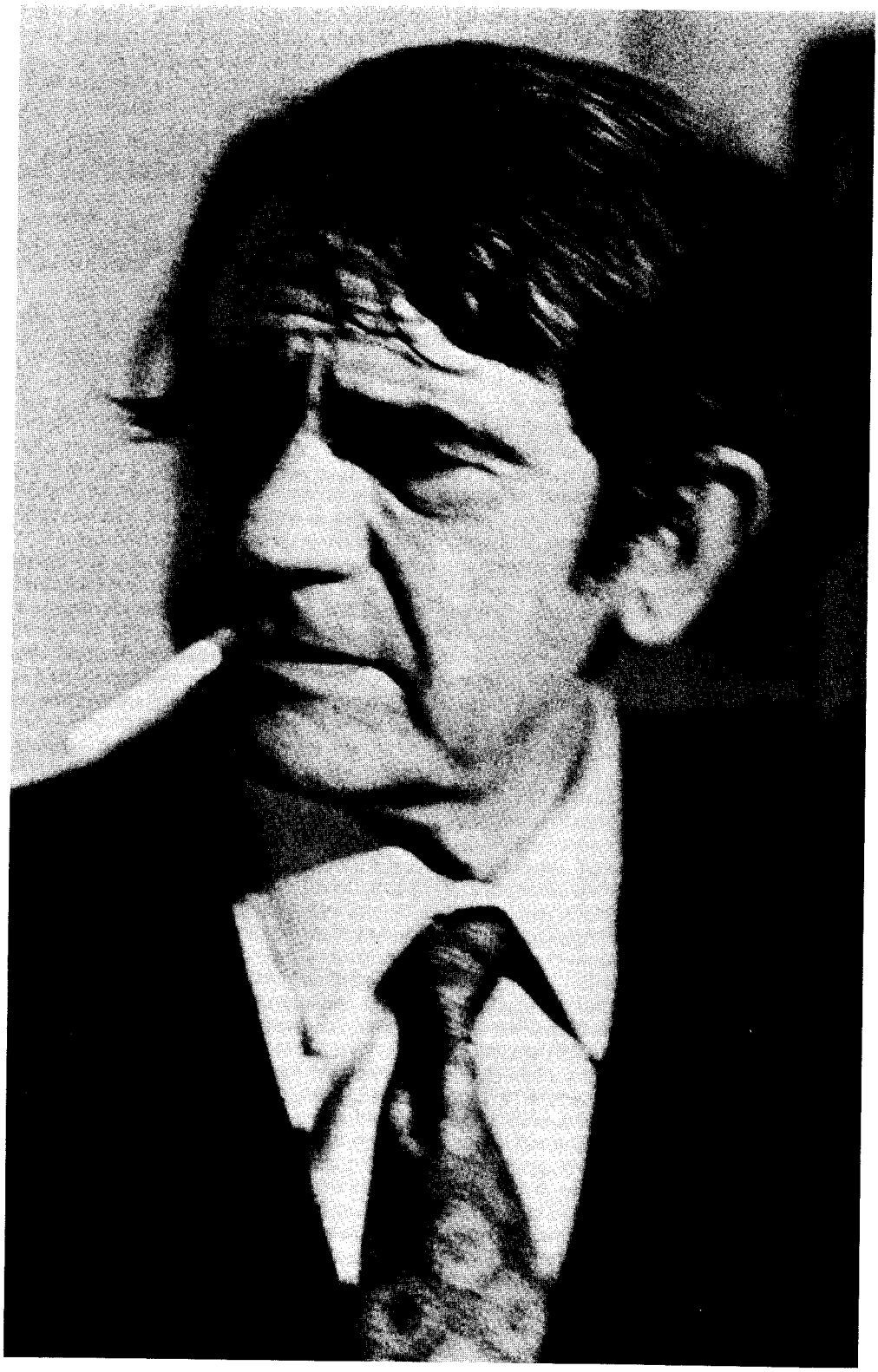
The general tenor of Schaeffer's essay is critical of contemporary music which falls short of a criterion that is revealed as the essay unfolds. This criterion establishes an interconnection between the audience and the composer, necessary for communication. In Schaeffer's system, this presupposes a societal involvement in art. The individual, therefore, cannot possibly create a "system", nor can any ethic exist whereby a piece can turn in on itself; i.e. answer to a system intrinsic to itself and avoid relations with outward reality.

The article is divided roughly into two sections. The first is devoted to a brief overview of the work of major contemporary composers from Boulez to Stockhausen, Cage, Reich, and Ferrari, and an incapsulated interpretation of musical development through the 50s to the present day. Schaeffer then interprets this through an analytical approach which is germinally concerned with communication. In the light of Schaeffer's primary involvement with media and larger questions of media and society,concerns which have occupied a large part of his career in radio, it is not surprising that he would approach music through these channels. And ultimately, the strength of Schaeffer's work lies in its attempt to view the contemporary situation in a wider context, daring, as it were, to see the forest. □

Donna Zapf

FOOTNOTES

1. Ray Stannard Baker, "New Music For an Old World," *McClure's Magazine*, vol. 27, no. 3 1906, p. 293.
2. Edgard Varese, 1916 as cited in article of Chou Wen-Chung, "Open Rather Than Bounded," *Perspectives on American Composers*, ed. Benjamin Boretz and Edward T. Cone, (W.W. Norton & Company New York), 1971, p.49.
3. *Ibid.*
4. Edgard Varese in conversation with Gunther Schuller, *Perspectives*, p. 37.
5. Edgard Varese, "The Liberation of Sound", this exerpt first published 1916, compiled and edited by Chou Wen-Chung, *Perspectives*, p. 25.



Pierre Schaeffer

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 1930s. 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 *Musique Concrète* (Paris, 1948) and *Elektronische Musik* (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.

Musique Concrète 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. *Elektronische Musik* 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 maleable 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.

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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." 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 accomodate 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, *concrète* despite themselves. The rules of dodecaphony stretched the ear beyond its habitual listening patterns. 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 infinitessimal 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.

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Equally, the process of composition was effected. 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 spotlight. 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 the school of process 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. [E.G. *Structure for Two Pianos* by Boulez.] 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).

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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 Pythagorus 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.

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 Stoc-

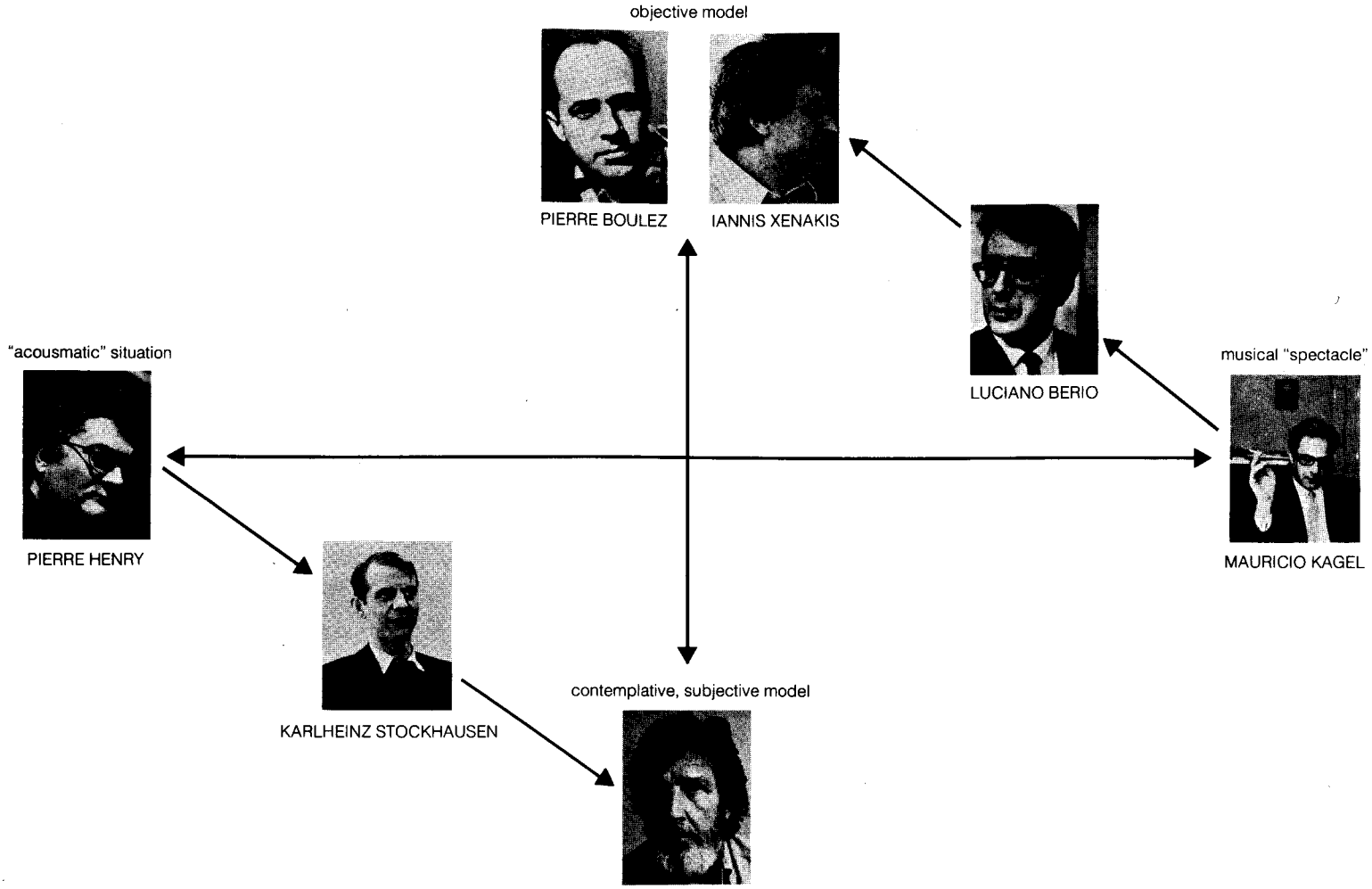

Figure 1

khausen, 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 *Hymen*. Then, after several theatrical "mise en scénes", 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 hommage 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).

European music in the eighteenth century for example achieved an evolutionary apogée. 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,

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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

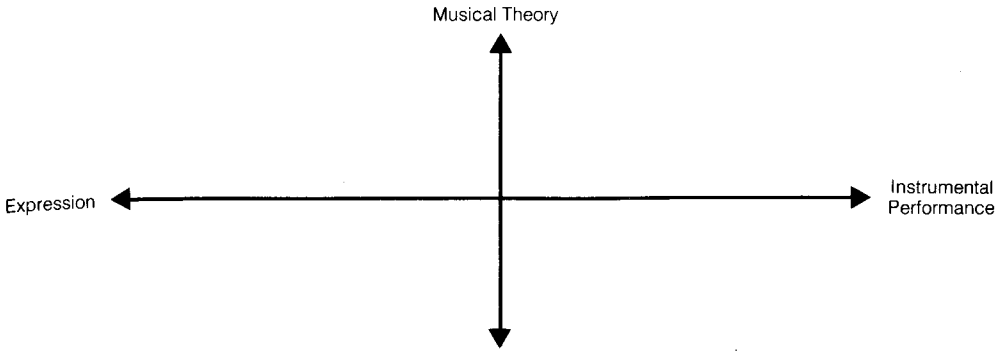

Figure 2

sufficiently cognizant of instrumental rules and orchestration to recognize the actual playing or the conductors' interpretations. (see figure 3).

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.

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.

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.

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 illustrated 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 emittor-to-receptor direction. But we must, especially in an acousmatic situation, also consider the receptor-to-emittor direction. The investigation thus becomes a double one, as I have demonstrated in my *Traité*, all music contains noise, not in the connotion 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 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. Nowa-

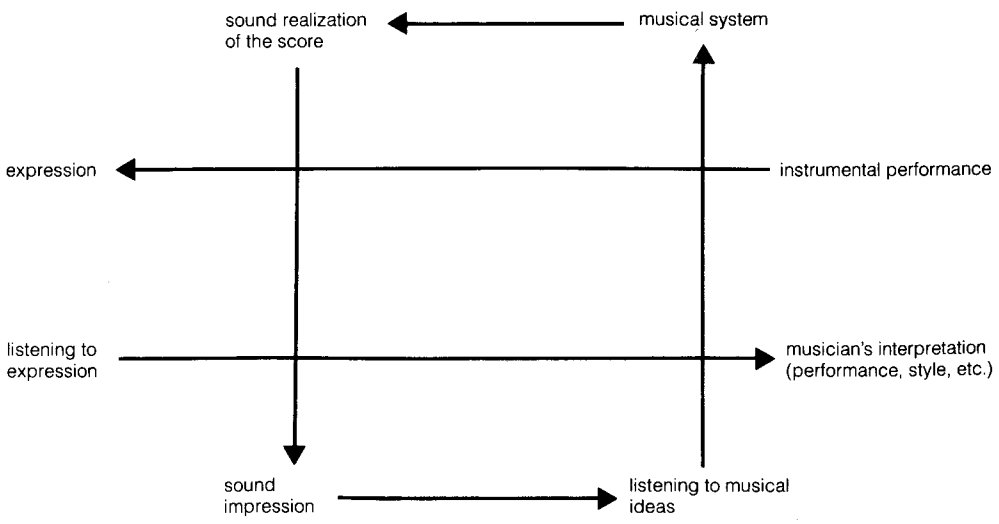

Figure 3

TRADITIONAL LISTENING

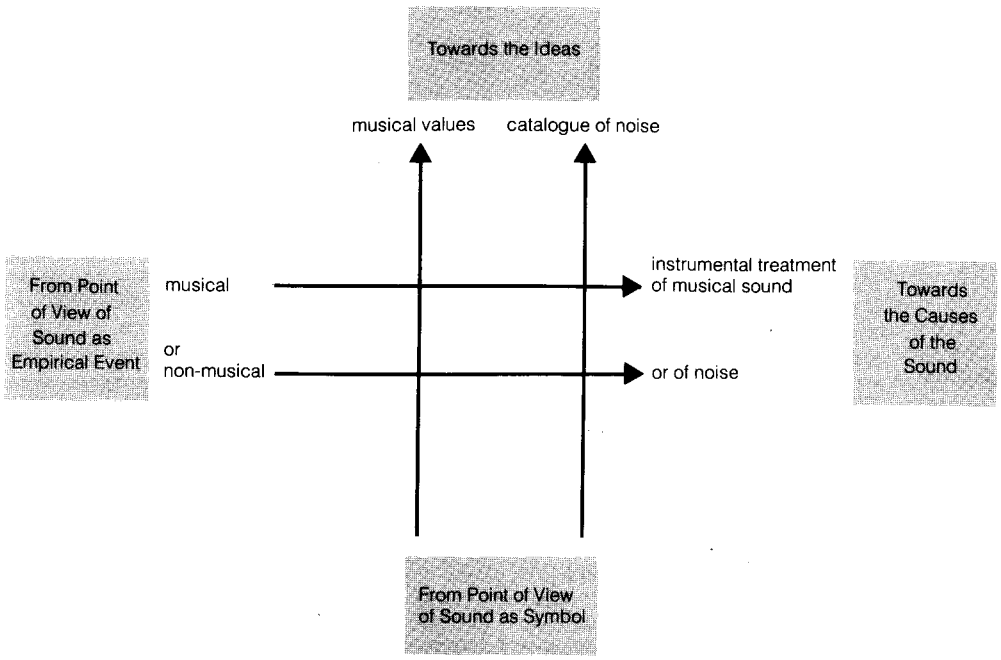

Figure 4 FOURFOLD POINTS OF MUSICAL AND ORDINARY LISTENING; DEPARTING FROM SOUND AS SYMBOL OR SOUND AS EMPIRICAL EVENT.

days he does not find well known instruments, but new sound sources; if the music derives from either electronic music or *concrète* 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.

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 *concrète* 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-to-north trajectory, the listener remains the prisoner of the east-to-west. 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 dead-ends, 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.

To compose is to push music blindly forward in the search for a path amongst fearful obstacles.

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.

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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. □