for Talea, México

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In 1954 I was invited by the Westdeutsche Rundfunk (West German Radio Network) in Cologne to realize a project of my own choice in their Studio for electronic music which a few years earlier had been founded by Herbert Eimert, the unforgotten pioneer in this newly discovered field of sound production.

I decided to use this opportunity for further pursuing an idea that had occupied my mind ever since the late forties. It was an oratorio in honor of the Holy Spirit. The text ~~—~~ which I had completed at this earlier date was taken from the Bible. The opening section began with quotations from the book Genesis relating man's early crude attempts at getting a hold of divine intelligence: the eating from the tree of Knowledge which leads to the expulsion from Paradise, and the erection of the Tower of Babel, punished by the confusion of languages. Later sections would present prophecies from the Old Testament predicting the future coming of the Spirit, passages from the ~~the~~ Gospels announcing his near presence, and finally the story from the Acts about the miracle of Pentecost when the confusion of languages seems to be resolved ~~through~~ divine grace, ~~as~~ as the listeners coming from many nations feel that they understand the apostles' preaching each in his own language. When I started sketching the music for this oratorio I soon felt frustrated because I kept imagining sounds which I could not associate with anything that I was accustomed to hear ~~produced~~ from traditional instruments. But when I heard for the first time a demonstration of electronic sounds I knew immediately that this was the medium in which I should be able to realize what I had imagined for my oratorio.

Latin version of the

However, it was not only the new and unusual sounds that aroused my keen interest as soon as I became acquainted with the electronic medium. Like some other, younger composers ~~[illegible]~~ at that time I began to apply the principles of serialism in my compositional projects, and I soon discovered that serial pre-organization of the parameter of time would lead to extraordinary complexities in the interplay of the durations of individual sounds. Since electronic music at that time was very little known and despised by the conservatives as a meaningless plaything or, even worse, a devilish scheme set up by the radicals in order to annihilate music entirely, I was asked to give over the radio a lecture in which I would explain ~~[illegible]~~ some of the characteristic potentialities of this new method of sound production. In order to demonstrate the possibilities of realizing utmost rhythmic precision I decided to use an example

from ancient music rather than to make up one of my own because the familiar sound combinations would lend the demonstration higher credibility. There is in the Missa L'homme armé by Josquin de Près a famous mensuration canon in which the three voices proceed at different speeds, at the ratios of 1:2:3:

(ex 1)

Resolution: (ex. 2) The lowest voice moves twice, the top voice three times as fast as the middle voice. If this setting is executed at a reasonable tempo of ♩ = M. 72 for the bass part the time difference between the (entrances of the) dotted eighth (half) note f in the bass and the (whole) note a (in measure 3) at the end of the measure is 5/18, or 0.277... of one second. It would be foolish to expect this degree of accuracy from live performers although the rhythmic relationships of this canon are not difficult to execute if we are satisfied with an "al fresco" result. Utmost precision is obtainable with a minimum effort if we realize this piece on tape. In those days the tapes were running at a speed of 76 cm per second. 5/18 of 76 is 21.2 cm. It is merely a problem of close attention and patience to cut, this length of tape and coordinate the tapes for this measure of the music so that the second a in the top part will appear exactly 21.2 cm after the dotted eighth f in the bass.

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The sections of tape assigned to each tone in the eleven-member time series have the lengths of 48, 59, 89, 89, 53, 156, 66, 30, 183, 52, and 62 cm, that is, in seconds: 0.63, 0.788, 1.17, 1.17, 0.7, 2.05, 0.868, 0.394, 1.35, 0.68, 0.81. Obviously it is absolutely impossible for live musicians to produce these durations accurately.

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At that time I was not able to complete more than the first section of the oratorio which ends with the confusion of languages after the Tower of Babel episode in chaotic vocal turbulence. This music was so constructed that I might have used this portion of the tape in reverse for the scene of the pentecostal miracle, leading back from chaos to order. I have never found an opportunity to test this idea.[1]

When a few years later I had again access to electronic installations, many things had changed. On the one hand my compositional thinking was not any longer so strongly attracted to the arithmetical intricacies and bureaucratic involutions of total serialization. On the other hand the components of the electronic equipment and the technique of combining them in the processes of sound production had rapidly developed and their more recent states suggested different uses of their potentialities. Since the modern models of oscillators which can be found in the new installations of the synthesizer

[1] The section realized in Cologne was issued on a disk by the Deutsche Grammophon Gesellschaft

type, usually are not calibrated to allow the precise dialling of a definite frequency, the composer's interest is by necessity directed toward other aspects of the material. Since in the electronic medium all frequencies are equally available the temptation to construct unorthodox tempered scales, not so long ago still a preoccupation of many experiment-minded composers, has vanished. Its place was taken by a fascination with an extraordinarily rich spectrum of timbres offered by an array of more and more sophisticated modifying devices. This seems to induce some composers especially of the younger generations to concentrate their efforts so exclusively on the production of extraordinary sounds that no energy appears to be left for using these sounds in what in bygone days was called composition, that is some kind of coherent design. Listening to some of these works, I feel as if a painter would show me his palette with a fine display of colors to which I would say: "Beautiful – but now how about using them for a painting?"

I realize that this concentration on the sonorous material as a it might be unfair to interpret purely regressive tendency, a move toward a kind of neo-primitivism because it so appears to a mind that still identifies music with a concept of organized sequences of sounds progressing in time, made by experts and appreciated by people endowed by nature with a receptive potential. According to more recent views music should not any longer be confined to this kind of mental and social reservation, but should become an ingredient of everyday's life, a part of our environment, neither intellectually nor emotionally demanding, rather hypnotically inducing a state of meditative trance – all of which probably may be traced to oriental ways of experience.

Be that as it may, this attitude, consciously or not, seems to take into account some of the negative characteristics ascribed to the electronic medium from its early days. The electronic sounds were criticized for being rigid, mechanical, life- and "soul"-less and therefore unsuitable for making music, which was traditionally defined as a vehicle of expression. Since this quality seems to reside mainly in the ever so minute factors of unsteadiness attached to humanly produced sounds – irregularities of vibrato, unevenness of attack and decay, fluctuations of volume –, much has been done to equip the electronic installations with devices that would allow imitation of those human touches. Even so, in spite of the infinite variety of sound production available in the lately developed machinery – something even an old practioner can not help admiring –, the audible products show a certain unmistakable homogeneity which may unfavorably compare with the accustomed (timbral) richness of ensembles of live instruments.

However, this circumstance does not need to stand in the way of using the electronic medium for the creation of ever so desirably "expressive"

When I worked on my oratorio we used only sine waves, i.e. tones without partials, of a neutral, colorless timbre. ~~Sounds could be modified only by nuances of articulation or piling up sine tones in clusters~~. Today an infinite number of timbral nuances may be obtained by changing wave forms while the sound emanates from the oscillator, and by applying elaborate filtering systems.

music, provided the composer will be aware of what "composition" means and not resign himself to arranging more or less unusual sounds into a kind of acoustical wallpaper. It may be true, though, that the electronic sounds present themselves to their best advantage when they are combined with instrumental or vocal sounds. For experience teaches that purely electronic compositions lend themselves to private listening only by small groups gathered around a tape machine or record player because listening in a hall and staring at an empty platform is a peculiarly uninspiring and soporific affair.

For the last ten years I have been privileged by being able to use for electronic work my own installation set up in my study in my home in Palm Springs. This machinery (the Buchla Modular System) is far from elaborate. But I have learned that obtaining satisfactory results does not depend on playing around with an array of fantastically expensive gadgets. According to the character of the sound-generating apparatus I have developed a manner of composition quite different from earlier methods. After having conceived a fairly clear and complete outline of the whole compositional project I start by experimenting with sounds and sound configurations that would correspond to the images that I have formed in my mind for various essential points of the over-all design. The sounds which I find satisfactory are recorded on tape and put away. Then I begin to work on connecting links, transitions and such, rounding out the previously prepared material by adding related elements, expanding here, eliminating there, and so forth. It is interesting that such procedures bring back to composition the concepts of spontaneity and inspiration so cherished by critics and audiences complaining about the cerebral and scientific character of contemporary music. While in the field of serial composition all details of the design are premeditated, in the procedure described above the basic material of a work is the result of improvisatory experimentation and the final shape of the work is the product of purely aesthetically determined selection of satisfactory solution from a limitless number of possible ones.

The concluding example is taken from my work Tape and Double for two pianos and electronic tape (Bärenreiter-Verlag, Kassel; record: ORS-75204, Orion Co., Malibu, CA). The design above the staves indicates approximately the sequence of events recorded on the tape which can not be notated more precisely because the pitches are not determined. In the piano parts nothing is left to improvisation. They are coordinated with the tape. To ascertain more visibly perfect coordination the durations of the individual sections of the tape are given in seconds