

The analysis of electronic music

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1.

IF WE VIEW the panorama of electronic music through its thirty years of existence, what is perhaps most striking is the discrepancy between the vast amount of work that has been put in and the results that have issued: hundreds of pieces involving a wide variety of technologies which have emerged then disappeared with great rapidity. New types of musician with new rôles have appeared around the composer, and have enriched the world of musical interpretation.

A number of works may now be judged to be important and have found their way into the usual channels of concert programming. A little hindsight has allowed us to make a technical assessment, and now we are beginning to feel our way towards the first aesthetic evaluations of artistic products which are finite, and no longer the first hesitant steps in the discovery of a new terrain. Some works have appeared on record, and have reached a distribution and assimilation by the public comparable to that of contemporary music for traditional instruments.

Even if we limit our study to compositions for electronic instruments alone (normally performed through the medium of tape), the panorama remains extremely varied, rich and multiform. Tape is an amorphous technical support, quite independent of its content. It is like talking about "brass music", without specifying whether we mean a Renaissance consort, a competition band, a jazz group or an ensemble in a country village.

To narrow the horizon further, I shall limit myself to consideration of tape music which has kept abreast of the evolution of thought in contemporary music — what used to be called 'serious music',

perhaps out of contempt on the one hand or élitism on the other, but which is now happily just “music”.

One might have expected such a wealth of pieces to have stimulated major theoretical comment, as was the case with instrumental music in the period after 1950. But the landscape of thought and criticism is suprisingly barren. There are a few important but rather general texts by established figures (like Boulez, Stockhausen, Xenakis and others), and practically nothing from the younger generation. If we count specifically examples of musical analysis, the number is reduced simply . . . to zero. There is no lack of outstanding models (like Boulez’s analysis of the *Rite of Spring*), which have revealed things so profound that one may see a given work in a completely new light, even clearer perhaps than the composer himself could have shed. The reference points are there — but still no examples.

2.

In this article I should like to describe some of the problems I encountered attempting to analyse Jean-Claude Risset’s *Songes* for tape. I had already published a number of analyses of contemporary instrumental works, so I had firm ideas about the organization and presentation of musical material, and was keen to maintain the same standards, albeit within a different context. I had at my disposal a quadraphonic tape, a few sketches, and notes from a conversation with the composer. However, the problems I encountered, and the difficulties that had to be overcome as I attempted to preserve certain musical standards (it was never my intention to be satisfied with description of the method of synthesis or of the algorithm employed), obliged me to abandon the project for the time being.

What does it mean to analyse a piece? In fact the term itself (from the Greek *ana-luo*, to dissolve) is only part of the story. It describes only the first, simplest and most tedious step in the process: the division of the work into segments, and the regrouping of the same according to different criteria (of similarity, contrast, expression, etc.). With a keen ear and eye, and the patience of a saint, one may accomplish this stage with relative ease.

But what is the use of taking a compositional mechanism apart, of tearing asunder its internal organism, if we are incapable of putting it

together again? This is the most important and the most creative of challenges: a logical and coherent synthesis of disparate segments to reconstruct a unified totality, which may or may not be the same as the one at the outset. In the course of this synthesis, each individual brings to bear his own contribution, and expresses a personal vision which reflects his education, culture and the time in which he lives. The sort of logic we are describing is not universal, and changes from one culture to the next. Through analysis, we reveal the composer only after revealing ourselves, in an act of creation of something which is personal, controversial and alive. If this were not the case, we would be talking about "archeological reconstruction" of the choices and conditions of work of the composer. Fortunately we are not all archeologists!

3.

If we attempt to hold firm to these principles and apply them to computer music, we discover quite new problems and a new reality. One of the principal characteristics of this music is that it exists and is performed more or less exclusively on tape, without any effective visual representation. Traditionally two types of what may loosely be called a "score" have existed: a list of operational data, or a general sketch of the musical effects obtained.

The function of operational data is to give a detailed description of the use and control of the instruments employed. This is therefore linked to a specific machine and program. It is completely incomprehensible to most musicians, and directed simply towards specialists. The machines themselves, moreover, are continually superceded and replaced, and their programs are frequently reviewed, modified and improved. This type of representation is therefore soon redundant, and even while it remains effective, it is only capable of producing one result. The truth is that nobody is really interested in doing exactly what the composer has done for a second time.

On the other hand, there are the various schematic representations of the aural result, ranging from a number of Stockhausen's works to Ligeti's *Articulation*. But although the composers attempt to be as precise as possible, their notation is always rather crude and approximate, particularly in comparison with the complexity and perfection of traditional notation. Analysts in search of compositional method,

or something more profound than a simple observation of contrast or similarity will find themselves up against a brick wall.

What does it mean to write a musical score — any score? The most important thing is the distinction between what should be notated and what should be interpreted. In more precise terms, a score means a reduction of information which involves a knowledge of the materials employed, their laws of organization and their comprehensibility. This enables the composer to select those elements of musical thought which need to be notated in most detail, those which need only be sketched, and finally those which are left to the discretion of the interpreter. In tonal music, for example, the most important space has always been occupied by pitch, followed by rhythm. Little freedom has been left to the interpreter here (except for what may be regarded as ornamental or superficial). Next have come dynamics and change of tempo, which have been determined in a much more summary, schematic and less precise way. It is this balance of freedom and constraint, of notation and interpretation which is so completely missing in operational data. These data are rather the outcome of a musical idea, of its interpretation and realization. In electronic music, in fact, the role of interpreter has far from disappeared: it is absorbed within the act of composition.

Let us look at two examples. Imagine listening to a pianist playing a romantic work, a Chopin *Nocturne*, for example. If we try to notate all the nuances of time and dynamic as precisely as possible, we end up with an extremely complex score, full of superimposed irrational rhythms, overloaded with information and far from the original simplicity of the work. If we now give this score to a second pianist, to perform as faithfully as possible, will we hear an exact reproduction of the original interpretation? Or will we have invoked some sort of musical schizophrenia?

As a second example, let us imagine a composer/interpreter at the moment of realizing the simple idea of a dynamic crescendo on a computer. The operational data which result, which are the object of study in the case of analysis, will probably hardly show a trace of this simple idea. We now know that the impression of a crescendo is not so much linked to the absolute amplitude of a sound, as to the increase and change in distribution of spectral energy, and the upward movement of its barycentre. Furthermore, in the case of repeated notes, there is also likely to be a small change in the shape of the

amplitude envelope. But which analytical wizard would succeed in inferring from these complex parameters a unity as simple as a crescendo? And who would not be tempted to try to understand the significance of each change, to trace its evolution, serialize it, examine it under a microscope, compare it with the rest, etc., completely betraying the musical sense of the idea? The relationship between the complexity of the effect and the simplicity of the result is also a function of context: the behaviour of the same parameters in another situation would be quite different, even if the idea remained the same.

Neither operational data, with their cold, technical disposition, nor the composer's graphic representations may be considered as "scores". So we have eliminated everything that exists to date.

4.

Perception fanatics seem to suggest another, radically different approach. "Let's get rid of the written text, and think more about what happens to our ears!" they say. Perhaps they are right, but then they must be prepared to limit themselves to the discovery of a few superficial features, a few oppositions of contrast, and little else. Unfortunately, perception, as it passes through the sieve of our auditive system, is an extremely variable personal phenomenon. For the same sound stimulus, everyone has a different perception and reaction. It seems difficult, therefore, to establish common, objective elements on such changeable bases. If we could offer a running commentary on sound examples, we might be able to focus and guide perception as a consequence. But then we would have to attach a super 8 to every article!

Let us simply consider the difficulty of locating with certainty a passage for detailed examination in a tape composition. What sort of musical indication should be given on paper? Absolute time? Definitely not; it may well be far from the basic musical conception. How many people would recognize in the following time succession (0, 0.2381, 0.4762, 0.7143, 1.0714) the index of a triplet followed by a duplet in the time of crotchet equals 84? A timbral point of reference, perhaps? Even worse. As there are no easily recognizable instrumental timbres, we have to rely on dangerous approximations to describe the sounds we hear (pseudo-bell, pseudo-strings, etc.). It is dangerous for two reasons: firstly because it strips each new sound of

its own individuality, continually referring it to a known quantity; secondly, because it over-simplifies and cheapens workmanship which may well be highly refined. It is as if the violin, viola, cello and bass were always called "string instruments", or if a delicately structured counterpoint between them were analysed as a "mass of strings". The greatest part of the musical content, easily visible in the score, would be lost irremediably.

And how many of us would be capable of appreciating the full force of construction of a Bach fugue by listening alone: the form, the delicate play of microstructural symmetries or contrasts of blocks within larger sections? Listening follows a specific musical time: even if we repeat passages, it cannot easily jump from one point to the next, move backwards or forwards, stop on a chord to analyse its components in detail, or immediately compare the symmetry of structural blocks separated in time. Visual examination of the score encounters no time constraint, and may easily penetrate beneath appearances towards the generative ideas of the work. I am not suggesting that one cannot understand and have a feel of a work at a single hearing. Quite the contrary! But in this case an analysis of the score may well become a seductive and indispensable tool.

However, what remains a choice in instrumental music (analysis of the score, or auditive analysis?), becomes in tape music an obligation with no alternatives, and a problem to be solved. I did not wish to draw up an exhaustive list of the difficulties one may encounter in this context: I do not care for catalogues. But those that I have examined are among the most problematic and thorny, because they can only be solved by an effort on the part of the composers themselves. The absence of a notation is due neither to laziness nor to indifference, but rather to the musical impossibility of really knowing and understanding the material and its laws, in a way necessary to offer a description. The means of expression are the measure of the ideas which support them.

It is true that certain works have been conceived for tape alone, and that they are at present impossible to transcribe and analyse — and in this case we can only be sure of a relative and superficial analytical understanding. But those who would claim the right to more prepared and aware listening, to a more intense involvement in the experience of the music, must for the moment be disappointed.

Translated by Nigel Osborne