

The epistemological analysis of the changes in musical language runs parallel to the technological development of the computer as an aid to musical composition. The mutual influence becomes evident already in the planning stage of the computer program. For the evaluation of the conclusions that will be derived from this inter-marriage of art and science, the gratification at the fact that ratio and irratio interact in the process of fertilization is playing a decisive role. All aesthetic criticism is conditioned on the imaginative faculty of the giver and the power of comprehension of the recipient - and the resulting feedback. The cybernetic model of physiological information - processing in the human organism - in our present case of musical compositions - is therefore being realized in practice by an infinity of gradations of conscious or only partially conscious perceptions, as well as by information completely or imperfectly stored in one's memory.

This state of affairs is well known in the history of music. The beginnings of both polyphony and meter in musica mensuralis brought a wealth of information, combined with a new motivation, in musical language, which the conventionally trained contemporary musician was not prepared to grasp with his intellect and memory. Beyond the mnemonic assistance of the course of the direction of neumating writing, it became necessary to develop a notation capable of visually expressing not only greater details but also novel structures of sound.

Now, when we compare the wealth of information and its effect upon the music of ars nova with the electronic music of the 20th century, not only a great quantitative difference becomes evident, but there also emerge qualitative assessments in the interplay of ratio and irratio of the computers' instrumental range.

When a new notation for the new music is under discussion, epistemological points of issue must be chosen, lest extraneous factors mislead us from the start. The decisive fact is that the elec-

tronic instrument creating sounds awakened an essentially new motivation in the activity of the brain, both in the composer's creative process and in the listener's receptive process. When the interpreter is eliminated, the composer no longer needs to take into consideration the technical difficulties in playing an instrument. Limits are now imposed by mental capacity, but not by the mechanics of members of the human body. Thus the traditional notation is a prescription for the instrumentalist who interprets the opus of the composer by subjectively intuiting those informations which do not lend themselves to notation.

As against this, the notation of computer music informs the computer with the utmost exactness of all particulars of each sound of the composition and of the resulting macrostructure of the composition as a whole, which is realized by the computer on the basis of the instructions. Then the living reality of the sound echoes back to the composer, the vitally important feedback is established, which ensures the ongoing dialogue between the composer and the computer. This notation is constructed upon a conception basically different from that of the traditional notation. This notation for the computer concerns interpretation only so far as composer and interpreter are one and the same person. The composers' responsibility has become absolute.

Although it would appear that the notation for the computer is the reverse of the notation for the interpreter, yet both have an essential element in common: both serve as mnemotechnical aids to the composer as well as to the interested listener who may become increasingly aware of the constellations of musical language. Without notation it is no longer possible to master the wealth of information. The visibility of all the details of the musical process enables the composer to review his thought process, it also compels him to pause and reflect during his emotional procedure and to organic discipline in the shaping of his opus. It is a basic condition for the conservation of outburst and reflection in extensive presentations. Out of these conceptual considerations arose the TALMARK notation.

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