

Digitization and Concept: A Thought Experiment Concerning New Music

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In December 2006, in the Bundeskunsthalle in Bonn, the chess program Deep Fritz defeated the reigning world champion, the Russian Vladimir Kramnik, after six games with a score of 4:2 points. The computer was able to win two games, while Kramnik only managed to reach a stalemate four times. For the chess world, this meant that the battle of man against machine was lost, and that, in the foreseeable future, there would soon be no one left who could even achieve a tie with the chess computer. But what does this historical caesura in the game of chess mean for music?

The irony of this tale is that one of the programmers of Deep Fritz changed his playing field after that notable endgame on the 8 x 8 black-and-white board: he is now developing a computer program that does not play chess, but rather composes. As was to be expected, the prototype for this program, which was presented to the public for the first time at the aforementioned tournament, elicited chuckles from computer experts—but the chess players, it is said, refrained from such mockery. The chess machine could also be beaten at leisure in the beginning, but was sufficiently optimized by the programmers from one version to the next that its tenth generation proved invincible for humans.

How does this case apply to New Music? Should one now expect composition programs to become as powerful as that chess program? Is a play of decisions like that between Kramnik and Fritz conceivable in New Music? Could one, for example, imagine an impeccably qualified jury choosing among hundreds of anonymous scores and awarding a highly remunerated prize to the very composition produced—as would transpire afterwards—by an amateur with the help of a computer?

In the following I would like to carry out a thought experiment in which I shall attempt to estimate the consequences of digitization for New Music. It is less a matter of expounding the current state of things than an attempt at a first assessment of the maximum possible impact of a technical innovation that currently seems to be extending to the furthest corners of society. A decisive aspect of this philosophical investigation is the level of argumentation. Although Franz Liszt already broke free of functional tonality in his *Bagatelle sans tonalité* of 1885, this did not inevitably lead to the invention of New Music such as the free atonal works of Schönberg in the early 20th century. Innovations do not change the world at the moment of their appearance; they can remain bagatelles in history to be rediscovered later, or foreshadow later, unrelated discoveries of the same phenomena. Whether an event makes history or not does not depend only on the event, but also on the context in which it occurs. One can, for example, trace the use of the computer in music far back into the 20th century without encountering any conspicuous change in music's self-identity. At best, the products of computer music presented a new style—one among many other styles. Yet for evolutionary processes to set in, there must be not only the possibility for variation, but also a social context to select and restabilize it.

The following comments should not be mistaken for an empirical description of the present scene in New Music; nor should they be taken as a determinate prediction of the future. Rather, they are an attempt to chart the furthest ramifications of the impact of digitization on composition.

I¹

It is primarily in three aspects that the computer has a lasting effect on New Music's conditions of production. The first of these is the creation of a score in the broadest sense, which means not only writing down notes, but also producing piano reductions and copying instrumental parts. Secondly, digitization also affects musical realization, i.e., the act of rendering the written scores audible. Thirdly, the use of the computer concerns the compositional process itself, the possibilities of generating musical material and organizing it to form a piece of music. In the following, I shall analyze all three aspects individually and attempt to judge the plausible limits of their consequences for music.

The most obvious and at first seemingly harmless innovation is the possibility of writing scores at the computer. Composition has long been characterized by the extremely laborious process of writing notes on paper. Each individual note had to be written on the manuscript paper by hand and with great care. Now there are programs that can be used to produce entire scores at the computer, which—in some compositional styles, at least—makes the entire writing process considerably more efficient.

This initially inconspicuous gain in efficiency places a reciprocal, escalating pressure on both composers and music publishers to adapt to this situation. Without doubt the publishers who print the scores and make them available for concert performances show a preference for composers who offer them the finished digitized scores, as this considerably reduces publishing costs. One can already foresee music publishers reacting to handwritten scores as reluctantly as book publishers accept typewriter manuscripts today. Following a transitional period that has long since begun, the entire infrastructure of music publishers will be adjusted to center on digitized scores, so that even exceptions for particularly successful composers who pride themselves on using forms of notation that cannot yet be digitized will become increasingly costly, and thus require greater justification than before.

The shift to digitized scores is not simply a facet of recent developments in today's economy, however; composition itself may perhaps benefit from it. It makes something completely natural and feasible that had previously involved considerable effort: corrections after the completion of the score. With little effort several variants of the score can be produced and placed alongside one another, enabling a visual comparison between them. The digitized score thus not only increases the possibilities of correction, but also creates an additional level of musical information that can form the basis for further compositional decisions. In addition, certain types of hyper-complex scores cannot be realized with sufficient clarity when written by hand.

¹ This first part was previously published in German as an essay in Harry Lehmann, "Die Digitalisierung der Neuen Musik: Ein Gedankenexperiment," *Vernetzungen: Neue Musik im Kontext von Wissenschaft und Technik*, INNM Darmstadt, Vol. 49, ed. J. P. Hiekel (Mainz: Schott Verlag, 2009), pp. 33-43.

Finally, this technical development occasions a degree not only of productive, but also social freedom: composers have become somewhat more independent of the institution of the music publisher, which had previously been fundamental in determining the level of exposure they could attain. As long as the production, duplication, and distribution of scores continues to remain dependent on which publisher prints which score by which composer, the opportunities for unpublished composers to be performed by major ensembles are limited. In addition, follow-up performances of a piece are far more difficult to organize without the connection to a publisher. As soon as scores can be reproduced and distributed with ease, the written form of each composition can essentially be present in any place at any time. In the mid-term, the major music publishers will have far less influence on the visibility of a composer in the music system, as the much cheaper production of sheet music and Internet-based promotion strategies will result in these traditional companies having to compete with small, newly founded publishers—or even being forced out by agencies specializing exclusively in marketing composers.

This development in New Music is no isolated phenomenon, but is rather tied to a social context characterized by an increasing digitization and networking of all socially relevant information. Accordingly, one can surmise that modern society will take on the form of a computer society. This does not simply mean the invention of new technology that triggers waves of innovation in such clearly demarcated specialist fields as medicine or space travel; the computer is rather a rare example of an innovation that affects all areas of our lifeworld. Like writing and printing, the computer constitutes a new medium for the dissemination of communication—and communication occurs wherever a society exists.² Hence the scores produced by music publishers are still products of the print medium society, which is likely to change in the foreseeable future.

The second major New Music institution that will be restructured in the computer society after the publishing world is the entire performance apparatus, consisting of festivals and concert halls as well as the soloists, ensembles, singers and conductors they enlist. A written poem can be read at any time, even if no publisher prints it; the painted picture is visible, even if it is not displayed in an exhibition; but a score that does not sound is incomplete as a musical work. This dilemma, namely that compositions are written, but not performed, that they are legible but not audible, is likely to diminish in the computer age. It is not a fundamental problem, only a question of computational power and improved programs for digital scores to be realized with high sound quality by electro-acoustic means. There have long been programs that do not simply produce impoverished MIDI sounds, but even manage to reproduce the nuanced sound of a piano with baffling authenticity.

As with the digitized score, this also gives the composer a new level of freedom. He need no longer rely on his musical imagination, and does not have to judge from a glance at the notation whether a passage is successful or in need of improvement; rather, he can base his decision directly on his listening impression. Even if the sound quality will never reach the opulence of a symphony orchestra, this development should generally lead to a significant increase in the significance of listening in the compositional process. The central question among composers, composition teachers and

² See Dirk Baecker, *Studien zur nächsten Gesellschaft* (Frankfurt am Main: Suhrkamp Verlag, 2007).

composition students, namely whether something is composed well or badly, is likely to be replaced in many cases by the question of whether the piece sounds good or bad. A new level of musical experimentation also ensues, that is to say a dimension in which compositional decisions can be evaluated immediately. Previously it involved a great deal of time and work for a composer to make corrections to the score based on the lessons learned in the first orchestral rehearsals. If it becomes a readily available option for composers to experiment with the sound of the score before the first rehearsals, it is likely that the technical accuracy of New Music performances in general will increase.

These possibilities for a technical realization of scores not only have implications for composers; they also change the status of the performer in New Music. If a computer program succeeds in transforming a score for a particular instrument or instrumental group into sound, this performance will probably lack subjective expression, but the sonic execution of each individual note will be technically perfect. Unlike human beings, the machine makes no mistakes here and plays all the correct notes. Even if the limits of playability have shifted ever further in the last decades, so that pieces are appearing in the concert repertoire that were once considered unplayable are now able to be performed, the compositional possibilities connected to each instrument are anthropologically limited. It is therefore an easy matter to write scores that are and will always be absolutely unplayable. The invention of the pianola already made it possible to play any combination of notes, no matter how abstruse, at any tempo, as demonstrated in exemplary fashion by Nancarrow's *Studies for Player Piano*.

Extending the possibilities of a technical realization of unplayable scores will result in a degree of compositional energy being diverted to the writing of such absolutely unplayable works. This creates a situation in music comparable to that in chess: the machine plays better than the human. Such a technological development does not supplant the virtuoso, but it changes the status of virtuosity in music. Because of the music's inner technicality, there continues to be a close symbiosis between composers and performers that has more to do with sport than with art. The composer writes a piece so technically demanding that for some years it can only be played by the "world's best" performers, and such performers happen to prefer pieces with which they can demonstrate their technical prowess. Someone looking at the New Music scene today could suppose that the performance of New Music were an Olympic discipline. As soon as unplayable piano or violin pieces can be reproduced by a computer with a sufficiently high sound quality for concert performance, as soon as the technical virtuosity of musicians faces the competition of virtuoso technology, the technical peaks of soloists will be put into perspective. The quality of musicians would be measured less by their technical brilliance than the ability to analyze a composition, to follow its inner logic and develop its idea. Whatever the musician is unable to do can, in case of doubt, be played or concealed by the sound machinery. In this sense, the technicization of performance practice directs the performer back to his true art: the art of interpreting music in a substantial fashion.

Once individual instrumental parts in a score can be played electronically with concert sound quality, it is only a small step to imagine scores whose parts will partly be played by soloists and partly generated by computer. One motive for this compositional direction would be to integrate unplayable score elements, voices, and passages into a live performance; this leads to a second economic motive that will inexorably affect

concert life. The highest costs in New Music come neither from the composition commissions nor the sheet music, but rather from the performance apparatus with its musicians, soloists and conductors, as well as the infrastructure required for all this to function. As soon as the performance of an ensemble piece for 12 instruments can be carried out by seven musicians and five computer parts, composers, aware of the insufficient rehearsal time available and the restricted budgets of the organizers, will be able to accommodate them with such hybrid forms of performance. These two economic factors are essentially already expected, but until now the solution to the problem has usually been seen in adapting the level of each composition to the given performance possibilities from the outset. The other option, however, is to look for technological alternatives instead of remaining confined by the practical limitations of an ensemble.

Even in a highly subsidized culture, one cannot leave the question of expenses out of the equation, and as soon as there are technical resources to carry out a task, the logic of rationalization will take effect here too. Maximizing profit is not the decisive motive here; there are also a number of arguments to support this form of musical technicization. Organizers can always adopt the position that the resources saved can be used to fund other, more demanding projects. Regardless of whether such statements will apply in each concrete case or be influenced by quite different motives, the mere fact that this argumentative figure is plausible is sufficient to change New Music's sense of direction in the manner described. None of these foreseeable developments mark the decline of Western music, but rather continue its history as a history of immanent gains in autonomy. The technical innovations that replace human musicians also generate a new form of institutional independence on the part of the composers, and accordingly an independence of New Music from the "aesthetic performance apparatus."

After digital notation and electro-acoustic realization, the third aspect of New Music's digitization relates to the compositional process itself. Referring to the situation we described at the start, the following question remains: how presumptuous or misguided is the programmers' project of developing a composition computer after optimizing their chess computer to the point of invincibility? The ambition of the engineers was not initially directed at New Music, but they rather focused on the field of pop music, which is based on relatively simple rhythmic and harmonic patterns and is easiest to program owing to the high degree of redundancy in its musical structures. But the repertoire of Classical-Romantic music too, which has become progressively differentiated within the fixed framework of a tonal system, is not safe from its digital simulation in the 21st century. Just as the chess computer can be fed thousands of variations on gambits and defenses as well as entire paradigmatic chess games, it is naturally also possible for a computer to draw on a database containing the complete scores of Mozart and "reckon" with them, in both senses of the word. Following the model of the chess program, the computer can draw its musical material from these pieces, drawing on characteristic melodic sequences, rhythms and harmonic patterns and assessing each variation in terms of their "Mozart-likeness."

New Music has long included examples of completely computer-generated music; Xenakis in particular "wrote" such pieces as *GENDY3*, which followed his ideas of an "automated art" and were generated by a composition machine. As mentioned above, however, these experiments led at best to a new compositional style, but did not change the notion of composition itself. Until now, computer music has lacked the necessary

social context to become an evolutionary attractor for New Music. This changes as soon as the computer does not simply remain one technological innovation among many, but rather, via the personal computer and the Internet, changes into a new means of disseminating communication. The consequences of this are obvious as far as the writing of scores and their musical realization is concerned, for both the digitized scores and their digitized electro-acoustic realization constitute qualitative leaps in the distribution of music. But to what extent is this true for the compositional process?

Something that would change the medium of New Music far more radically than Xenakis' composition machine is a kind of kit containing prefabricated New Music material. It would be conceivable for every composer to have numerous generalized compositional techniques to draw on at the computer, to be given a universal composition tool with which Classical, Romantic, atonal, serialist, complexist, stochastic, or spectralist sound types can be generated, varied, combined, selected, or rejected. The radical change in visual art caused by the Photoshop software has yet to occur in New Music; but it is surely only a matter of time until an analogous Soundshop program is developed. Here too, the computer would be employed as a medium of dissemination, in this case the dissemination of compositional techniques. Regardless of training and background, a composer could draw to a previously unheard-of extent on the composition-technical achievements of New Music—in other words, any composer would have the fully differentiated medium of New Music at their disposal. The innovation that puts the category of composition under pressure is not the fact that new compositional techniques can be developed with the aid of the computer, but that the computer can essentially simulate all compositional techniques ever developed. The decisive innovation will be that the compositional process can focus less on the individual note; instead, it can draw on an entire arsenal of musical objects and processes from the repertoire of New Music that, in analogy to the graphics program, can be compressed or stretched, colored in or left blank, focused or unfocused, lightened or darkened, harmonized or deharmonized, accelerated or decelerated—all with a few mouse clicks. In this sense, composing with the computer presents a particularly vivid illustration of Ortega y Gasset's *bon mot* that technology is the effort to spare oneself effort.

Such methods of production have in general been consigned to studios for electronic music and not yet had a widespread impact on classical composition with notes. Whenever live electronics are involved, the sound material recorded by instrumentalists or singers, as well as sounds and noises of any origin, can be electronically processed and played back during the concert performance. Such developments have not yet had significant repercussions for the practice of composition, as the respective fields of instrumental and electronic music can be institutionally separated due to a central difference: the former remains tied to the micro-logic of notes, while the latter works at the macro-level of aesthetic perception with acoustic units that can no longer be broken down into individual notes—or only into an infinite series of such individual notes. If computer programs were also able to simulate the compositional techniques of 20th-century instrumental composers, however, if they could automatically group the sound material into similar musical units, one could manipulate these larger

semantic units in the same way that has long been common practice in electronic music.³ By contrast—and the contrast is decisive—the computer would be able to convert the sounds thus generated automatically back into note values. A score in the conventional sense would be produced, yet composition itself would not take place within the medium of the score.

If these technical possibilities were even partly realized, a new level of compositional emergence would appear in the center of composed New Music in the tradition of Bach, Mozart, Beethoven, Schönberg, Webern, Ferneyhough and Lachenmann. It would be possible to experiment with the sound material of these composers at a higher level of generalization without having to learn their compositional techniques in the conventional sense. This would also mean that the knowledge of the inner constitution of sounds previously required in order to "write them down" would lose its significance through their simulation via computer. Knowledge of music's micro-logic would cease to be a precondition for composition—and it would be impossible to undermine this phenomenon through disciplinary separation, as in the case of electronic music, for it would affect the very core of instrumental composition. This is the qualitatively new situation that leads to the digitization of New Music redefines its understanding of music.

The digitization of New Music would thus also be likely to have far-reaching consequences for its third institutional pillar: the academic training traditionally undergone by composers. It is not only the institutions of the music publisher and the orchestra that impose practical limitations on the arena of New Music; this is already regulated much earlier according to the degree of musical talent that qualifies a person to study composition. These requirements stem from the traditional understanding of composition, which will be undermined slowly but surely through the digitization of New Music. Being able to play the piano is only a necessary precondition for studying composition as long as composing, in the simplest terms, means assembling complex sounds from individual notes.

Music is the most technical of the arts, for it has to generate its own medium at an elementary pre-musical level. The aesthetic units of music are not the individual notes, but rather the configurations of those elementary events that combine to form musical shapes, states, events and processes. Such preparatory technical construction is not required in literature or visual art. If one has learned to speak and write, it is self-evident how words are formed from individual letters. No one needs to know specific compositional rules or develop complicated mathematical algorithms at the level of word formation in order to generate semantic units of language from letters. Similarly, our visual perception automatically constructs identifiable shapes from registered light stimuli without a need to know about the corresponding laws of synthesis. If the digitization of New Music leads to the possibility of operating with advanced musical semantic units, or rather "composing," without substantial prior knowledge, the requirements and course of compositional training at music colleges will have to adjust.

³ Editor's note. Numerous compositional algorithms for composing music "in the style" of Beethoven and other historical composers have been developed by composer-theorists such as David Cope. Here the author's focus is on creating similar compositional algorithms to imitate the styles of more recent composers.

Composition courses could place much less emphasis on conveying to students a body of specialized technical knowledge that can largely only be passed on orally. As in the visual arts, this development would lead to a de-academization of New Music. Thanks to the reduction of the technical load through the computer, people who have partial or no training, who only decide on composition late in life, or who come from other professional backgrounds will still be able to distinguish themselves as composers.

The digitization of New Music destabilizes all three institutional pillars on which it has so far rested. The publisher, the orchestra, and the academy will lose some of their traditional positions of power and be forced to redefine their functions as institutions. Viewed positively, this means that New Music's digitization will go hand in hand with its democratization. In this art as in others, the new technology will free people from the requirement of technical skill and thus free future generations from the general requirements for access to the composing profession.

It would be premature to conclude from these altered conditions of production that, to paraphrase Josef Beuys, "everyone is a composer." They would rather lead to a re-evaluation and re-disposition of key responsibilities: it is foreseeable that there will be an aestheticization and conceptualization of New Music. As soon as the musical experiment is tied less to the written score and more to an immediately available sonic realization, the aesthetic judgement that states the worth of a composition will generally be shifted from the reading of scores to listening—not least because there will be increasingly complicated computer-generated scores that only follow their own logic and will initially be incomprehensible to others as texts. If composition ends up consisting less in an assembling of note values into processual musical shapes than in the digital manipulation of musical objects, this will raise the question of which aesthetic perceptions are actually experienced through which musical objects and processes. Neither the subjective impressions of the listener nor the compositional techniques of the composer would be the relevant descriptive criteria for this. The decisive aspect for the aesthetic experience of music would rather be a level of medium definition that would operate somewhere between music journalism and musicology, between emotional description and score analysis, and with aesthetic parameters such as order and contrast, emptiness and redundancy, suddenness and intensity, blurring and defamiliarization.

This aestheticization of New Music, however, is only a consequence of the fact that its *traditional* technical difficulties will recede into the background in future. In parallel, the question of a composition's musical Gehalt⁴ (content) is likely to become more significant than it is today. With time, the pressure of technical innovation will shift attention away from technical problems to those of a Gehalt-aesthetic nature. As is already the case in the visual arts, a composition would have to present its own concept—or, differently put: music that placed itself within the avant-garde tradition and defines itself explicitly as New Music would be conceptual in its entire constitution.

It goes without saying that people will still be able to work beyond the computer-controlled limits of programmability. One can design notational systems for which the

⁴ The German word "Gehalt" cannot be adequately translated into English. It is systematically differentiated by the author from content "Inhalt" which means, for example, something that can be represented in a picture. In contrast, "Gehalt" is always mediated content, meaning it is content only first made accessible through the experience and the interpretation of an artwork.

programs do not yet exist, or, on a smaller scale, conceive of performance instructions and techniques for classical orchestral instruments of such a nature that the respective compositions cannot yet be simulated digitally or played electronically—and one can naturally still develop a compositional technique of one's own that will only be integrated into the digital toolboxes of composition programs years later. Nor can one rule out the possibility that the most innovative composers will be those who, in opposition to the technological facilitation of the composer's craft, write their scores by hand, explicitly avoid electronic playback technology of all kinds, and develop their own, autonomous compositional techniques. All this will continue to be possible, but the technological pressure will be accompanied by an additional pressure on the composers and institutions of New Music to justify the preference for such effortful procedures.

The prognoses elaborated here are hypothetical in character. The thought experiment was based on a question: what will happen to New Music once its medium is digitized? The answers resulting from this thought may sound like dreams of the future,⁵ but firstly, the age of digitization has only just begun, and secondly, the purpose of philosophical thought experiments is to push an idea to that neuralgic point at which such basal categories as "composing" and with it the self-description of an art are set in motion. The handicap of this thought experiment probably lies not so much in the fact that it makes unrealistic predictions, but more that it speaks in the conditional about things that have long existed.

II

Unlike science fiction, philosophy should only estimate possibilities whose probability it can judge. First of all, one has to assume that the digitization of New Music will have more or less severe consequences. Developmental processes can be institutionally dominant or marginalized, they can be welcomed in social systems or inhibited to the point of cessation. Hence we must ask: what does the evolutionary potential of an innovation depend on? Why should the digitization of New Music lead to a Gehalt-aesthetic orientation of this art? Within the framework of evolutionary theory, one can say that an innovation must offer the solution to a problem that already exists in the corresponding social context. The technical progress of digitization can only become an evolutionary stage for New Music if it relates to a problem that affects the existence and self-identity of New Music. Does any such problem of reference exist?

New Music's very name stands for modernity. Newness is, first of all, simply a different word for its claim to be absolutely modern. Upon closer examination, it transpires that the concept of the new has a specific meaning here, that it does not extend to every aspect in relation to which music can be qualified as "new." When one speaks of New Music, one is not referring to the "newest song" or the "newest fashion," but rather music that is "new" in its own sense. This originally meant that New Music enabled an aesthetic perception that is incommensurable with the whole of music history. New Music defined itself through such radically new listening experiences from the start, and it was able to fulfil this claim by abandoning the traditional tonal medium of music while,

⁵ Translator's note: there is a pun here, as the German word *Zukunftsmusik* literally means "music of the future."

at the same time, exploring a new musical material such as the twelve-note row or microtonality.

It was constitutive for the notion of New Music that this process of generating new musical material was viewed as never-ending; this meant that New Music defined itself through a taboo, namely the taboo of using elements from musical tradition. In the early 1970s, people in New Music realized what had long been obvious in visual art: that the "material progress" (Adorno) in the arts is not an ahistorical but a historical parameter, and that it essentially feeds off a logic of outdoing based on the negation of traditional systems of representation. As this negation of tradition could not be continued indefinitely, artists sooner or later reached a zero point of the avant-garde, the stage of last pictures and compositions—that could no longer be outdone. These zero points were the predetermined breaking points with the historical avant-garde; it was here that postmodernity crystallized as the dominant model of production and self-description in the arts. Newness was now no longer defined via the exclusion of old musical material, but rather through its ironically undermined inclusion. Accordingly, the new in postmodern music is associated less with the new material than with its new mixture; the musical material is not examined and explored, but rather sampled and hybridized.

The concept of material has remained more current in New Music than in other arts, as one can see from the fact that the best-known living composers, for example Lachenmann or Ferneyhough, are considered exponents of the avant-garde rather than postmodernity. This special status of music among the arts is connected firstly to the circumstance that the decisive innovations of these composers are already thirty or forty years old, and only managed to establish themselves in the New Music system very slowly—not least because of the music's technical difficulties. Secondly, it is less obvious in music than in painting, for example, that the paradigm of material progress has run its course. Precisely because music has to create its own medium at the elementary level of individual notes, a reflection on the medium of music continues to be an option for contemporary composers. What has changed is the fact that such material innovations have long been unable to compete with the effect and shock character of the avant-garde, and are accordingly no longer of great consequence for career development, let alone for music history.

The circumstance that the concept of the new in the arts can no longer be defined as endless material progress is due to the finitude of the human perceptual capacity. Aesthetic perception is also tied to a perceptual apparatus that is the result of biological evolution, and has accordingly adapted to a highly specific perceptual world. As a result of this adaptation to a particular environment, there are only a finite number of intrinsic aesthetic values in human perception: beauty, sublimity, the event, and ambivalence.⁶ Aesthetic modernity's ability since the mid-19th century to define itself through a concept of the new, specifically of new aesthetic material, had a perception-theoretical foundation: one was able to reject the classical aesthetic values of the beautiful and the sublime and instead seek refuge in the other two aesthetic values—the event and aesthetic ambivalence—making this sphere of the aesthetic an object of artistic investigation. The end of material progress in art represented ultimately a success in terms of artistic

⁶ See Harry Lehmann: *Ästhetische Erfahrung und die Eigenwerte der Wahrnehmung* [Aesthetic Experience and the Intrinsic Values of Perception] (Paderborn: Mentis Verlag, forthcoming).

research: in every one of its disciplines, the art of aesthetic modernity had discovered the conditions of possibility for the aesthetic, that is to say all intrinsic values of perception.

The problem of reference in New Music is ultimately its claim of newness, which can no longer be supported through material progress or a progressive dissolution of the boundaries of human perception. The postmodern answer remains a temporary solution; though there are practically unlimited ways to recombine the accumulated material of music history, the novelty value of this method likewise diminishes with time. The manner in which the avant-garde counteracted the central idea of New Music before then with its low-tech movement had been much more radical. One can, for example, produce the most outlandish sounds with primitive electric toy instruments by short-circuiting them. But the "musical readymade," the conversion of consumer items into musical instruments capable of producing sounds that are absolutely new in comparison to musical tradition, already mocks the basic idea of New Music: that the most advanced musical material can only be generated by the most advanced musical techniques, and that aesthetically new, previously unheard-of music can only come about as a result of this technical progress.

Such instances of self-questioning in New Music have led to a progressive differentiation of music scenes, but they have not challenged the self-identity of the composed music that is taught at academies and performed in concert halls alongside works from the Classical-Romantic tradition. The reason for this is that low-tech music circumvents the concept of composition instead of changing it. This must first be understood in order to realize how much innovative potential lies, by contrast, in the digitization of New Music. The composition computer does not break with the tradition of composed music; rather, it can speed up compositional processes and facilitate the generation, transformation and sampling of composed aesthetic material. As soon as these technological "aids" become standard equipment for a young generation of composers, they will deform the concept of composition in New Music to the point where it requires explicit redefinition.

It is clear enough that the general lowering of barriers to involvement in New Music, like any process of democratization, also has its negative side. If some elaborate compositional processes and their micro-logic disappear behind the interactive user interfaces of the computer, strong inflationary effects are to be expected. Previously, one could still argue that differences of quality were the factors determining the success or failure of a composer's career, but upon closer interrogation the question of quality is still answered with reference to the mastery of a compositional technique. With the digitization of the compositional process, this whole evaluative practice loses its legitimation. In New Music, as in visual art—which has already experienced two crises of identity, the first through the invention of photography and the second through the digitization of images—technical control over the medium and the production of aesthetically perfect works are becoming increasingly inadequate criteria for acceptance as "good art" within the society of art producers and consumers. The tendency will be for digitization to result in a situation where even professional connoisseurs find it more and more difficult to decide from a glance at the score, or by ear, whether or not a composition is "new" in keeping with the self-identity of New Music.

The digitization of New Music can thus take up a problem of reference in New Music that it in fact exacerbates: how to conceive of the new in music. The solution to the

problem would be for the concept of the new no longer to be defined via the material or unfettered aesthetic experience, but rather through the Gehalt of a composition. The Gehalt of a composition is not exhausted in its aesthetic experience, but is rather—unlike all consumer or practical aesthetics, including pop music—anchored in a concept. One can still adopt the perspective of modernity, namely the aim to reflect on the medium of music, but it has long since lost the status of a binding paradigm and has become one conception among many. However, as soon as the background aesthetic of aesthetic modernity becomes merely an option to be chosen or rejected a thematicization of the conceptuality of the work will become inescapable. Advanced art is based on conceptual choices that are constitutive for aesthetic experience itself. The verbalization of the concept has been a part of the work ever since the explicit pluralization of such concepts has occurred via the development of postmodernity. What will become increasingly obvious through the digitization of New Music is the fact that the use, and even the invention of compositional techniques, will be a conceptual choice that is not automatically self-legitimizing.

Such a Gehalt-aesthetic turn (eine gehaltsästhetische Wende) is likely to prove especially difficult for music, being the most asemantic of the arts. But music too involves formal choices made for observation by a listener. Once it becomes technically unproblematic to produce a "New Music sound," the question of what conception is formatted by a composition can no longer be dismissed as trivial. It will become important for a musical work of art whether its concept is interesting or banal, whether it takes up clichés or circumvents them, whether a composer is able to communicate his ideas to others or must take refuge in the topos of the incommunicable nature of music. This, incidentally, explains the conspicuous phenomenon that many successful composers are rhetorically brilliant, or perhaps able to articulate themselves within the framework of a self-made artist-aesthetic.

The concepts of New Music can be extremely diverse. These concepts can exist as strategies for the appropriation of musical tradition, works can be composed directly following literary texts, or ideas from the natural sciences such as Heisenberg's uncertainty principle or theorems from chaos theory can be used as compositional models; many composers like to refer to architectural models; some attempt to explore religious ideas within the medium of music, Zen Buddhism being particularly attractive since the 1960's; others engage with foreign cultures, take a stance on political events, use mythological or historical subjects or thematicize their own experiences, for example the feeling of disorientation in a big city. One can hardly deny that such outside references ultimately flow into the composition of contemporary music in a more or less explicit fashion; the question remains as to their assigned status.

As long as New Music had a shared horizon of communication, it was possible to view such concepts as auxiliary constructions to be used and forgotten. But this ironically ignorant relationship to one's own musical concepts is only plausible if the reflexive aspect of New Music is understood as a reflection on its material, and there is a consensus on this understanding. As soon as this consensus, which was based on the original notion of New Music, dissolves, it will become clear that "musical concepts" are not simply makeshift constructs, but rather a constitutive aspect of the musical work of art. Ultimately, New Music is here going through the same development that took place

much more obviously in visual art. The appearance of concept art and the readymade resulted in a release of the reflexive component in the art system.⁷

As soon as this separation of the aesthetic and reflexive components of the musical work is taken seriously, there is once more a criterion to distinguish art music from entertainment music. Obviously pop music also works with forms of world-relation, but these "concepts" are either self-explanatory or conveyed through socialization in the culture of a given scene; they are not based on any discursive background knowledge that has to be gained by intellectual means.

The connection between the digitization and the conceptualization of New Music is not linear, but rather "dialectical" in its constitution. The fact that musical concepts are a substantial part of New Music remains a historical legacy of the avant-garde. The fact that this knowledge faces considerable difficulties in establishing itself in the concept and self-identity of New Music, and allows it to continue largely unchallenged as an aesthetic art to this day, is primarily due to the technical challenges involved in producing it. Its close connection to the classical repertoire in concert life further reinforces this reluctance to redefine its notion of itself. Here, where the opposition to a different self-perception is based more on historical factors than fundamental ones, the digitization of New Music should act as a catalyst for the acceleration of evolutionary processes that have long been in progress. Digitization leads to aestheticization, and this aestheticization in turn leads to a reactive conceptualization of New Music: a typical case of an "irony of history" that achieves the opposite of what is intended.

It is decisive for the entire argument to distinguish between the principles of concept and Gehalt. The musical concept is not the Gehalt (substance) of a composition; it provides the range within which the Gehalt of an aesthetic experience can unfold. As already stated, it is true of all advanced art that one can only observe its formal choices if one is aware of its basic conceptual conditions. The composer uses a concept to indicate an interest in a Gehalt that he can only articulate within the medium of music. Accordingly, there are two possibilities of failure: either the composition becomes an aesthetic duplicate of the concept, or it no longer has anything to do with it. Both result in the collapse within the field of tension that exists between idea and experience, the field that ideally generates works of art, and within which their Gehalt crystallizes.

The musical concept indicates a point of increased interest in the world among composers that can, of course, also produce negative results and can articulate itself as a general disinterest. The choice of concept means that the composer is interested in that particular subject and no other. The half-sentence "I am interested in..." among artists has the status of a concluding phrase that seems to forbid any further questions. Subjective interest is unquestionably a sufficient reason to compose, and requires no further justification; the claim to validity underlying such a statement, however, is anything but trivial. Firstly, it tells us that at this point, the composer wishes to clarify, discover, or articulate his own understanding of the world or himself or herself within the medium of music, and secondly that the experiential schemata created by the work

⁷ Using a cross-genre model, one can show that the conceptualization of the arts was [the result of?] an immanent decoupling of work, medium, and reflection in art; see my essay "Avant-garde Today: A Theoretical Model of Aesthetic Modernity" in *Critical Composition Today* (Hofheim: Wolke Verlag, 2006), p. 10.

through its formal language are also interesting for others, and could also stimulate them to clarify or reaffirm their relationship with the world. This claim to validity extends to the question of the social function of advanced art; in the present theoretical context, it would consist in the construction of new experiential schemata capable of provoking a new relationship of society with itself.⁸

This claim to social validity is systematically bypassed if advanced art, and specifically New Music, is perceived purely aesthetically. Only in the field of tension between intellectual concept and aesthetic experience can the recipient grasp those syntheses of meaning that make composers despair when they are absent, and euphoric when they appear in an unexpected manner. The question of whether the musical Gehalt of works is only of private interest, whether it is exciting or banal within the horizon of the history of meaning in the art system and in society, is one for music criticism.⁹ It uses an interpretation to close the gap between aesthetic experience and the artistic concept that determines the span of a work. Music criticism is not some a posteriori entity of mediation, but rather a constitutive element of New Music itself. What would be required of such music criticism is a form of complementary creativity to the compositional process. Its task cannot be restricted to translating the syntheses of meaning in a musical work of art into language and spelling them out; on the contrary, it produces these syntheses—as the composers also do, but from a contrasting perspective—first and foremost. Musical concepts are systems of coordinates set up by composers in order to compose. These concepts delineate the field in which the artist's relationship with the world seems exposed to frictions and tensions, and accordingly become interesting for him or her, but this relationship only actually articulates itself in the experiential schemata of the musical work. Criticism follows the independent logic of the concrete work and attempts to make the respective schemata explicit, or rather "re-experiencable." This experience through the work can be projected back onto the work's system of conceptual coordinates and placed in an explicit context. Now, however, the schemata and concepts are extrapolated and connected to the realm of cultural knowledge. The experimental interpretations of art criticism accordingly make a claim to validity that is only partly compatible with the artist's subjective relationship with the world; and this is the real reason why why artists are not the best ones to interpret their own work.

Translated by Wieland Hoban

⁸ Concerning the social function of art see Harry Lehmann: *Die flüchtige Wahrheit der Kunst. Ästhetik nach Luhmann* [The Fleeting Truth of Art: Aesthetics after Luhmann] (Munich: W. Fink Verlag, 2006).

⁹ See Harry Lehmann: "10 Thesen zur Kunstkritik" [10 Theses on Art Criticism] in *Merkur. Deutsche Zeitschrift für europäisches Denken*, Vol. 62, Issue 14, November 2008.