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## **Aesthetical Operativity. A Critical Approach to Visual Literacy with and Beyond Nelson Goodman's Theory of Notation**

### **Abstract**

The term *visual literacy* has been used in numerous fields of research for almost half a century. Despite its ›interdisciplinary career‹ the different approaches share a pedagogical tendency which has somewhat informed this notion since the Rochester Conference in 1969 at which it was first discussed. The present paper, however, will leave aside the educational aspect in order to give way to an inquiry from the perspective of contemporary writing theories that set their focus on the iconic potential of notations. A reconstruction of the main aspects of Nelson Goodman's theory of notation, which has been enthusiastically adopted by several contemporary authors will be followed by an account of the epistemological understanding of what has been lately described as *notational iconicity*. This approach shall be enriched by a terminological supplement capable to meet the requirements of pictorially designed notations. The term proposed in this paper is *aesthetical operativity* and its explanation will be based on the pictorial music notation of the Austrian-Greek composer Anestis Logothetis.

## 1. Introduction

The term *visual literacy* has been used in numerous fields of research for almost half a century. Despite its ›interdisciplinary career‹ the different approaches share a pedagogical tendency which has somewhat informed this notion since the Rochester Conference in 1969 at which it was first discussed.<sup>1</sup> The question »whether or not a university education can be based on images as well as text« (ELKINS 2008: 3) seems to be still relevant. The present paper, however, will leave aside the educational aspect in order to give way to an inquiry from the perspective of contemporary writing theories that set their focus on the iconic potential of notations.

The chosen way to approach the different forms of perceiving and using notations to generate new scientific insights or to give birth to a work in the performing arts is closely related to the techniques of reading and gazing. Nevertheless the main goal of the argumentation will not be to elucidate their differences and similarities (cf. MITCHELL 2008), but rather to explore the boundaries of what has been designated lately as *notational iconicity*.

In order to do so, it will be necessary to reconstruct the main aspects of Nelson Goodman's theory of notation, which has been enthusiastically adopted by several contemporary authors (chapter 1). Furthermore, an account of the epistemological understanding of the iconic potential of notations will help to delimit its action scope (chapter 2). This limit is set by notational phenomena in which visual or pictorial details play a fundamental role (chapter 3). Thus, what recent writing theories building on Goodman's philosophy have conceived as a strictly analytical form to articulate written signs needs to be enriched by a terminological supplement capable to meet the requirements of pictorially designed notations. The term proposed in this paper is *aesthetical operativity* and its explanation will be based on the pictorial music notation of Anestis Logothetis (chapter 4).

## 2. Nelson Goodman's Analytical Approach

### 2.1 Motivation

Nelson Goodman develops his theory of notation in a book entitled *Languages of Art. An Approach to a Theory of Symbols*. Both parts of the title stand for an inquiry into works of art, which aims at the analyzability of constructed worlds and the modes of reference they enable.<sup>2</sup> In this context the notion of truth has a mere control function within each particular symbol system (and between them), since »truth is no more a necessary than a sufficient

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<sup>1</sup> Cf. <http://ivla.org/new/ivla-history/> [accessed June 15, 2015].

<sup>2</sup> On the possibility of reference in science, logic, and art cf. GOODMAN 1984: 54ff.

consideration for a choice of a statement« (GOODMAN 1978: 120).<sup>3</sup> Accordingly any categorization is not to be prized for its truth-value »but for its efficacy in worldmaking and understanding« (GOODMAN 1978: 129). This focus on conceptual operativity is central to Goodman's theory of notation. It constitutes one of the fundamental aspects that has been adopted by contemporary writing theories, most notably by those of epistemological orientation.<sup>4</sup>

Goodman's preference for a nominalistic approach is based in both the flexibility in the range of terminological choices and in the limitation of operative variables, because »while nominalism leaves us great freedom in our choice of predicates and individuals, it drastically curtails the means available to us for constructing a system« (GOODMAN 1977: 28).<sup>5</sup> These could be seen as the reason why he uses popular notions such as ›language‹, ›art‹ or ›symbol‹ with such impartiality. The word ›symbol‹ for instance is used as a »very general and colorless term«, with which one can refer to ›letters, words, texts, pictures, diagrams, maps, models, and more« (GOODMAN 1976: xi).<sup>6</sup>

In his argumentation Goodman skips problems such as of »clarity, of legibility, of durability, of maneuverability, of ease of writing and reading, of graphic suggestiveness, of mnemonic efficacy, or of ready duplicability or performability« (GOODMAN 1976: 154). By contrast, it is of fundamental relevance whether the structure of each system presents any construction deficiencies and if it is possible to verify the identity of a constructed world by means of its components and the principles or rules they are combined by:

Much but by no means all worldmaking consists of taking apart and putting together, often conjointly: on the one hand, of dividing wholes into parts and partitioning kinds into subspecies, analyzing complexes into component features, drawing distinctions; on the other hand, of composing wholes and kinds out of parts and members and subclasses, combining features into complexes, and making connections. Such composition or decomposition is normally effected or assisted or consolidated by the application of labels: names, predicates, gestures, pictures, etc. (GOODMAN 1978: 7)

This analytical approach reveals that Goodman's theory of notation is an attempt to create the terminological preconditions for the ›composition‹ and the ›decomposition‹ of symbol systems. On this account, the notions he develops in order to ensure the ›analyzability‹ of all possible worlds should be understood within the theoretical boundaries determined by him, i.e., in the context of his nominalistic reflection on this media phenomenon. Thus, identity is to be understood »with respect to what is within that world as organized« (GOODMAN 1978: 8).

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<sup>3</sup> In his late work he proposes to use the term ›rightness‹ instead of ›truth‹, since »rightness pertains to all the ways that symbols function« and is therefore »multidimensional« (GOODMAN/ELGIN 1988: 156).

<sup>4</sup> Cf. FISCHER 1997: 87ff.; GRUBE/KOGGE 2005: 15; KRÄMER 2003: 162ff.; 2009: 101f.; MERSCH 2005: 221f.

<sup>5</sup> Cf. the programmatic essay by GOODMAN/QUINE 1947 as well as the analysis of the consequences of that approach in SHOTTENKIRK 2009: 45–55.

<sup>6</sup> For the argumentation in the present paper it is worth to note that in this enumeration the term ›pictures‹ belongs to the same category as other visual strategies, such as letters, maps, diagrams, etc.

## 2.2 Theory of Notation

Goodman's inquiry begins with an advice: besides of its practical means, one should not underestimate the theoretical relevance of notational systems. Thereby he does not ignore that notations can be used in countless ways, »but every score, as a score, has the logical prior office of identifying a work« (GOODMAN 1976: 128). In other words, there has to be a way to proof the compliance between the score and its performances, which

must be so related that in every chain where each step is either from score to compliant performance or from performance to covering score or from one copy of a score to another correct copy of it, all performances belong to the same work and all copies of scores define the same class of performances. Otherwise, the requisite of identification of a work for performance to performance would not be guaranteed. (GOODMAN 1976: 129)

The score and its performances or copies are subjected to logical equivalence and especially to transitivity so that  $A$  (score) =  $B$  (performance),  $B$  (score) =  $C$  (copy) and consequently  $A = C$ . Because of this equivalence relation, which ensures the »reconstructibility« of a score, performances and copies can be determined as true or false, depending on the congruence of their physiognomy, i.e., on the configuration of their single elements. From this principle of identity Goodman deduces two syntactic and three semantic requirements that serve for the verification of the correct structure of any notational system.

The first syntactic requirement concerns the characters that constitute every symbol scheme.<sup>7</sup> Characters are the abstraction class of inscriptions, utterances and marks that can be exchanged randomly without any syntactical consequences.<sup>8</sup> Independently of potential differences in their shape, every mark or inscription pertaining to the character › $A$ ‹—be it an › $a$ ‹, an › $A$ ‹, or an › $a$ ‹, etc.—have to be copies or replicas of each other. Hence a scheme is notational if and only if the elements pertaining to an abstraction class are *character-indifferent* (cf. GOODMAN 1976: 132). Character-indifference represents also an equivalence relation, since two marks belonging to a character can only be freely exchanged if neither of them belongs to a character the other does not. Once the classification of the character-indifferent marks is defined, any possibility that a mark belongs to more than one character is precluded. Otherwise the equivalence relation would be nullified. According to Goodman there is no requirement for a convenient layout or design of marks in order to simplify the identification of a given character: from his analytical point of view, only the possibility to distinguish between those marks that belong to a character and those that do not is a relevant criterion to identify works of art.

The second requirement is related to the *finite differentiation*, which implies that »for every two characters  $K$  and  $K'$  and every mark  $m$  that does

<sup>7</sup> Goodman does not make a distinction between a notational scheme and a notational system (cf. GOODMAN 1976: 131).

<sup>8</sup> Inscriptions and characters can be ›atomic‹ or ›compound‹, i.e., they may contain other inscriptions or characters. However, this does not lead to overlapping, since, as Goodman explains, › $j$ ‹ is contained in › $ju$ ‹ but both do not merge into each other (cf. GOODMAN 1976: 142).

*not actually belong to both, determination either that  $m$  does not belong to  $K$  or that  $m$  does not belong to  $K'$  is theoretically possible*» (GOODMAN 1976: 135f., original emphasis). This theoretical possibility can be guaranteed if the inscriptions do not merge into each other. There has to be always a space or an interval between them so that they can be articulated. In this sense neither a finite scheme constituted by only two elements nor one with countless characters would be a sufficient condition to enable finite differentiation. Only the principle of interspace is syntactically relevant. Schemes that do not fulfill this prerequisite are syntactically dense (cf. GOODMAN 1976: 136). In this context density means the impossibility to identify the single elements of a given scheme due to overlapping. As a result of this, it is theoretically impossible to decide whether a mark belongs to one or more characters. In such cases the given system can not be considered notational.

Although the *syntactically finite differentiation* is meant to ensure the recognition of a mark or inscription as pertaining to a certain symbol system, problems often arise by the identification of some elements with a similar shape. Yet this kind of problem »by no means precludes establishment of a system of disjoint classes of marks; it only makes hard the determination of the membership of some marks in such classes« (GOODMAN 1976: 134). Following this, there is no need to consider any potential obstacles related to practical means in the design of the elements for what eventually defines a notational system »is not how easily correct judgements can be made but what their consequences are« (GOODMAN 1976: 134). The consequences of these judgements are independent of the difficulties a notation may imply for its perception (and consequently for its use). Both syntactical requirements can be fulfilled by symbol systems of rather different shapes, such as the Latin alphabet or the standard music notation (the so called ›staff-notation‹). But besides of its ›grammatical‹ aspects every symbol system has a field of reference to which its elements are correlated. In order to regulate the kind of compliance between symbols and their meaning Goodman introduces three semantic premises.

Firstly, the correlation of a given element with its field of reference has to be unambiguous. For this purpose, the way a symbol is related to its field of reference must remain unchanged, i.e., a specific inscription or character will always have the same reference object—be it an idea, a fictional or a real entity—within a certain notational system. Ambiguous elements, however, have different *compliance-classes* (cf. GOODMAN 1976: 149), which makes the identification or reconstruction of a work futile. To avoid such indeterminacy a ›+‹ (plus sign), for instance, in a mathematical notation must always correlate to the field ›addition symbol‹.

The two further semantic requisites are parallel to the syntactical preconditions. On the one hand, the reference objects have to be disjoint, »[f]or if two different compliance-classes intersect, some inscription will have two compliants such that one belongs to a compliance-class the other does not« (GOODMAN 1976: 150). In such cases the correlation between a symbol and its

field of reference is disrupted by the lack of *semantical disjointness* (cf. GOODMAN 1976: 152). Thus it is theoretical unfeasible to distinguish between the characters and their compliance-classes and consequently to identify unequivocally if a given symbol actually corresponds to a field of reference within a specific notational system.

Concerning this problem Goodman asks if different characters must necessarily have different compliance-classes, i.e., if a system has to be free of redundancy. This means that two or more characters share a compliance-class and constitute therefore the opposite of ambiguousness (several compliance-classes for one character). Goodman is aware of the fact that redundancy can be a hurdle in the reconstruction of a work, but it does not affect the correlation of characters and their compliance-classes and can be easily circumvented by using only one term of each group of coextensive symbols. »Non-redundancy« (GOODMAN 1976: 151) is therefore not to be considered as a further requirement. Hence, strictly speaking *semantical disjointness* implies not only that compliance-classes have to be disjoint but that two characters cannot share any compliant (cf. GOODMAN 1976: 151f.).

As a result of *semantical disjointness* the correlation of characters and their reference object must be also unambiguous, so that there has to be a possibility to single out any compliance-class. Thus, the third and last requirement for notational systems is *semantic finite differentiation*, which means that »for every two characters *K* and *K'* such that their compliance-classes are not identical, and every object *h* that does not comply with both, determination either that *h* does not comply with *K* or that *h* does not comply with *K'* must be theoretically possible« (GOODMAN 1976: 152, original emphasis). The theoretical possibility of a definite correlation between a character and its compliance-class is based on the absence of any blending between the latter.

At this point it is important to emphasize that the requirements proposed by Goodman are meant to be a tool for the verification of operative systems that validates their construction. They work »like a building code that legislates against faults in construction« and not as a »vocabulary or grammar« (GOODMAN 1976: 154). Goodman's general interest in symbol systems and specific concern with notations involves

the disclosure of certain special features of the functioning of symbols not only in overt induction but also in such kindred processes as category detection and pattern perception: first, that evidence takes effect only through application of a general symbol (label or term or hypothesis) having an extension that properly includes the data; second, that the alternatives are primarily such general symbols, divergent in extension, rather than isolated particulars; and third, that pertinent time-and-trouble-saving habits can develop only through use of much symbols. Perhaps, indeed, these are earmarks of cognitive behavior in general. (GOODMAN 1976: 169f.)

Considering the aim of Goodman's analytical theory of notation it is reasonable to »sacrifice« the above mentioned aspects (legibility, durability, graphic suggestiveness, etc.), since they may be »necessary for any practicable notation [...]». But none of this has anything to do with the basic theoretical func-

tion of notational systems« (GOODMAN 1976: 154). The intention underlying his nominalistic understanding of notation is based on the possibility of a categorical distinction between notational and non-notational systems:

A system is notational, then, if and only if all objects complying with inscriptions of a given character belong to the same compliance class and we can, theoretically, determine that each mark belongs to, and each object complies with inscriptions of, at most one particular character. (GOODMAN 1976: 156)

Goodman concludes the explanation of his set of analytical tools by introducing one more (crucial) distinction, namely that between analog and digital symbol schemes and systems (cf. GOODMAN 1976: 159–164). Analog symbol schemes must be syntactically dense, whereas analog symbol systems are both syntactically and semantically dense. The denomination ›analog‹ stands for undifferentiated systems and represents the opposite of what Goodman defines as a notation. By contrast, digital schemes are discontinuous and digital systems are syntactically and semantically differentiated. In these systems the correlation of a given character and its compliance-class is unambiguous thus ensuring their notational status. Such systems have the advantage of »definiteness and repeatability of readings«, whereas analog systems »may offer greater sensibility and flexibility« (GOODMAN 1976: 161).

Goodman's categorical distinction between notational and non-notational systems is intended mainly as an analytical tool. Some contemporary writing theories, however, which adopted some of his ideas, have drawn their attention to the generative aspects of notations with a special focus on the production of knowledge. These theoretical approaches underlie the potential inherent to notational systems to gain new insights in established fields of knowledge or even smooth the way for new ones. In this context ›operativity‹ is attached to a very narrowly defined concept of ›iconicity‹, which at the same time helps to broaden the understanding of notational or writing practices beyond their reference to the oral layer.

### 3. Perception and Operativity of Epistemological Notations

At least since the beginnings of 20th century linguistics, writing systems have been treated as a subsidiary aspect of human communication, i.e., as a visual fixation of oral language (cf. SAUSSURE 1966: 16).<sup>9</sup> And to some extent the subsequent philological, socio-linguistic, and anthropological inquiries that tried to tackle the problematic relationship of oral and written language followed in Saussure's footsteps. Over four decades from the 1940's till the

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<sup>9</sup> This view privileging of the individual speaking (*parole*) can be found already in Jean-Jacques Rousseau: »L'écriture, qui semble devoir fixer la langue, est précisément ce qui l'altère; elle n'en change pas les mots, mais le génie; elle substitue l'exactitude à l'expression« (ROUSSEAU 1987: 89). The problem of reducing writing systems to a mere instrument of language visualization is addressed by DERRIDA 1967: 23; 1972: 179-184.

1990's a series of studies set their focus on the role of writing as an instrument to improve intellectual operations and therefore as a foundation stone of civilization. Yet their approach remained alphabet- and oral-centered since the advantages of writing systems were always analyzed in their relationship to the oral traditions they belonged to.<sup>10</sup>

From the perspective of the latest—mainly German—research on writing systems, notations are not only a necessary condition of epistemological research and of scientific progress, but have to be analyzed beyond any relationship to oral language. In this context, notations are understood as a disjoint symbol repertoire displayed on a two-dimensional—or in the case of clay tablets even three-dimensional—surface to articulate the different elements of reasoning processes. This serves to visualize structural aspects that cannot be deduced from spoken language.<sup>11</sup> Not only the visual appearance of alphabetic texts with their characteristic graphic differentiations such as breaks or intertitles, but also the configuration of mathematical formulas, programming codes or circuit diagrams show that there is a »structural iconicity« (KRÄMER 2003: 163, translation D.M.)<sup>12</sup> inherent to writing systems. This kind of iconic understanding implies to overlook certain visual details, since the »identity of a sign is no longer based on its concrete physiognomy, but only on the [...] position it occupies in a general configuration« (KRÄMER 2003: 163f., translation D.M.).

Hence, besides of their material presence and the perceptive processes of selection they are involved in, due to the disjointness and the finite differentiation of their symbol repertoires, writing systems can be used as an instrument to generate new cognitive insights or even new fields of knowledge. The potential to visualize epistemic processes shows how writing systems—or should we say script phenomena?—»open an ›opaque‹ space of operation« (KRÄMER 2005: 31, translation D.M.) in which not only palpable operating with written signs is possible, but in which the meaning of written utterances becomes manifest through a characteristic visual display. In script phenomena it is the general visual constellation and not the shape of the individual signs, which takes the center of the stage. The written signs with their manipulability serve for the construction of epistemic visual objects and constitute herewith the primary elements of a »pictorial operativity« (KRÄMER 2009: 98f., translation D.M.).<sup>13</sup>

Despite of the differences between the multiple possible approaches that accentuate the perceptual dimension of notations, all of them set their focus on script phenomena that are not subdued to spoken language. In order

<sup>10</sup> Cf. COULMAS 1981: 26; 1990: 11ff.; GELB 1952; GOODY 1987: 258ff.; HAVELOCK 1963: 36ff.; ONG 1982: 83. Some aspects of Jack Goody's studies can be seen as an exception to the oral-centered approach, in which he reflects on the origins of writing as an organizational principle and its use as an administrative instrument (cf. GOODY 1977: 74ff.; 1986: 48ff.).

<sup>11</sup> Roy Harris and Sybille Krämer, among others, allude to this particular characteristic of notations (cf. HARRIS 1995: 134–144; KRÄMER 2003: 160).

<sup>12</sup> The original German term is »Strukturbildlichkeit«.

<sup>13</sup> Krämer broadens her notion of *notational iconicity* by explaining *operative iconicity* in terms of ›flatness‹, ›directionality‹, ›graphism‹, ›syntacticality‹, ›referentiality‹ and ›operativity‹.

to outline a definition of writing systems in accordance with this approach, Werner Kogge and Gernot Grube (cf. GRUBE/KOGGE 2005) propose three criteria:

- Firstly, writing systems must have a field of reference and their reference function should neither be disrupted by a field of reference which cannot be perceptible by the senses nor—other than in Goodman’s theory of notation—by an ambiguous correlation between the written signs and their meaning (cf. GRUBE/KOGGE 2005: 13).<sup>14</sup>
- Secondly, writing systems must be—unlike some fields of reference—in any case perceptible to the senses. This way, they enable postprocessing and shiftings within the sign arrangement (cf. GRUBE/KOGGE 2005: 14) and allow consequently for a categorial distinction to ephemeral media. However, besides of the possibility to remove the written signs from their production context—with the help of storage technologies this is eventually also possible in the case of transitory media such as sound—another aspect becomes relevant: spatialization. Braille for instance shows that writing systems cannot be reduced to visual perception—although it plays a fundamental role concerning a great number of notational phenomena. Yet, what is more decisive is the possibility to move within the sign arrangement both according to specific rules and after the own instinct, i.e., in a playful way (cf. GRUBE/KOGGE 2005: 14).
- Finally, writing systems must be constituted by a finite differentiated sign repertoire which ensures that no two signs will merge into each other. This prerequisite already formulated by Goodman aims at the operability of writing systems: a syntactical disjoint and finite differentiated sign repertoire ensures the recognizability of each element as a singular entity within a sign system and the possibility to articulate them after certain principles (cf. GOODMAN 1976: 130ff.).

The three criteria of *referentiality*, *aesthetic* (i.e., perceptual) *presence*, and *operability* proposed by Grube and Kogge are useful to define the epistemological potential of certain writing systems. Nonetheless, these requirements cannot—and are not meant to—embrace aesthetical aspects of script phenomena despite of their relevance for their perceptibility, since »previous to any signification we are confronted with the fact that a writing system [...] ›shows itself‹ instead of referring to something else« (STRÄTLING/WITTE 2006: 7, translation D.M.). The primacy of visibility »becomes manifest through the body of the graphic shape« (STRÄTLING/WITTE 2006: 7, translation D.M.) of the written signs. The ›anatomic constitution‹ of the symbols creates an aesthetic (perceptual) tension which results in an interplay of visibility and invisibility. On the one hand, the opacity of a writing system opens a material perspective in which semantics are closely related to the shape of the signs. On the

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<sup>14</sup> Mathematical signs constitute a paradigmatic example of such correlations, since they refer to numbers, functions, terms, etc.

other hand, to get oneself into a gazing at the written symbols obstructs a fluent reading, whereas the physical presence of writing systems produces »a tension between an understanding that transcends the signs and the perceptive resistance of the material« so that »the [detailed, D.M.] look at the written signs cannot be separated of their [quick, D.M.] reading« (STRÄTLING/WITTE 2006: 7, translation D.M.).

This tension underlying the dualism that accentuates both the visible and the invisible side of writing systems implies—as mentioned before—a looking and an over-looking, i.e., the persistence of the look and the cursory decoding glance at the written elements. But can both perspectives emerge simultaneously? Does not the iconic aspect of writing systems challenge the decoding glance in a radical different manner as it does with the detailed gaze?<sup>15</sup> This dichotomy seems to be based on a continuous change of perspective which is inherent to writing systems since the eye fluctuates between code and visual nuance or—in terms of Goodman—between discontinuity and density. Hence what writing systems show or hide depends on the perceptive behavior of the reader who can alternate between both viewpoints.

As previously mentioned, since the early 1990's a number of contemporary writing theories have been arguing the case for a rethinking of the relationship between orality and »notationality«. Their accentuation of the material aspects of writing systems goes hand in hand with the focus on the iconic potential of this medium which—in the German scientific community—has been described as *notational iconicity* (*Schriftbildlichkeit*) (cf. KRÄMER 2003; KRÄMER/GIERTLER 2011; KRÄMER/CANCIK-KIRSCHBAUM/TOTZKE 2012) or more recently as *diagrammatics* (*Diagrammatik*) (cf. BAUER/ERNST 2010) or *diagrammatology* (cf. STJERNFELT 2007). We saw that in these theories it is the two- or three-dimensional disposition of the signs which is highlighted as the genuine iconic aspect of writing systems and therefore as its potential for analysis and epistemological innovation. Yet, the iconic aspect of several script phenomena can by no means be reduced to the arrangement of the sign repertoire on the inscription surface, but has to be extended to the specific shape or individual form of each symbol. From the hieroglyphs in ancient Egypt via the initial capital letter in baroque book art through to visual poetry in 20th century avant-garde there are numerous script phenomena that help in different ways to reflect on aesthetic aspects of writing systems. Some of these cultural practices shall be described subsequently in order to proof the scope of an iconical view on our object of study.

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<sup>15</sup> Both perspectives can emerge simultaneously, e.g., in the case of the perception of baroque initials: a letter is being recognized at the same moment as part of a sign repertoire (Latin alphabet) and as an aesthetical event with several semantic implications. The point made here focuses on the performative aspect of reading where both perspectives are confronted.

#### 4. Sign Forms, Forming Signs. Aesthetics of Writing Systems

In his inquiry into cultural techniques the French archeologist, paleontologist, and anthropologist André Leroi-Gourhan comes to the conclusion that the art in the Upper Paleolithic constitutes an early evidence of the interleave between script and image, since »[w]hat appear to be two divergent tracks starting at the birth of the agricultural economy in reality form only one« (LEROI-GOURHAN 1993: 191f.). However, the rhythmical sequences of points and lines on cave paintings are not meant to depict reality, but to represent abstract symbols, so that »in its origins figurative art was directly linked with language and was much closer to writing (in the broadest sense) than to what we understand by a work of art« (LEROI-GOURHAN 1993: 190). Thus, also in early use of iconic elements arrangement (or disposition) and iterance of signs took priority over their singular shape. The disassociation of visual art and script is due to a later development through which human beings found their way to representation of realistic, mythological, and religious figures and scenes, whereby often both media continued to appear in the same context or even merge into each other.

The hieroglyphic script in ancient Egypt is a paradigmatic example of this development since it connects the aspects of materiality and semanticity (cf. ASSMANN 1995: 76–92). The latter of both aspects grounds on the correlation of ideograms, phonograms, and determinatives with spoken language, while the issue of materiality points to the iconic character of the signs which make »world reference« possible. The first aspect concerns the role of signs within a symbol system; the second, however, alludes to the »sensible »support material« (ASSMANN 1995: 78, translation D.M.) on which signs emerge without compromising their functionality. Iconicity means here that the materiality of the sign is »latent co-significant« (ASSMANN 1995: 86, translation D.M.) and that consequently, besides the semantic aspect, a »physical layer of meaning« should be considered. This embodied meaning finds its expression in hieroglyphic inscriptions that contrary to the flexible material support of the practical oriented cursive writing draws upon the sensible presence of elaborate monumental contexts.

Yet, the kind of iconicity postulated here exceeds the »appetite for eternity that looks for its salvation in the sheer persistence and massiveness of the material« (ASSMANN 1995: 88, translation D.M.). It also concerns a particular form of signification, since hieroglyphs can denote the visualized object itself—as it is the case of ideograms—or its name in terms of the sound of its consonants. Furthermore, such signs can indirectly refer to a property of the represented object, such as »greed« (or »avarice«) and »violence« in the case of the crocodile-icon. The aesthetic effect generated by this kind of correlation is based on the potential of graphic representations to evoke metaphorical associations on a »sheer visual« layer. Nevertheless, both modes of signification—depiction and metaphorical reference—remain unaffected by visual

nuances. The shape of the signs has to be repeatable and even in the case of greater ›deviations‹ it does not come down to the exact physiognomy of the object. Thus, the material pictoriality of hieroglyphs can only be partly associated with an aesthetic approach to *notational iconicity*.

Script phenomena that are closely related to such a perspective can be found in typographical art, i.e., a discipline that aims at the combination of readability, ornamental beauty and expressiveness of writing. Within this wide field of research, historiated initials in illuminated manuscripts are an interesting example for the interaction of script and image. Besides of the striking magnificence of such letters whose meticulous design is meant to prize God's Word these medial hybrids help to illustrate the content and to orientate the readers within the complex structures of the ›script-image‹.<sup>16</sup> The sacramentary written for the Carolingian bishop Drogo of Metz (844–855) represents one of the peaks of this cultural phenomenon. In its 130 parchment pages there are several of such initials. They show a series of religious subjects and scenes and are determining for the spatialization of the verses (fig. 1).

This visualization strategy is even more sophisticated in psalters, the books containing the bulk of the Divine Office in form of psalms, whose allegorical or figured language serves as the basis for the layout of initials. Both the reading aloud of the psalms and the monumentality of the letters stand for a mystic-aesthetical approach to the liturgic text in which the artful embellished capitals bring on the contemplation of the moral and allegorical prose (fig. 2).

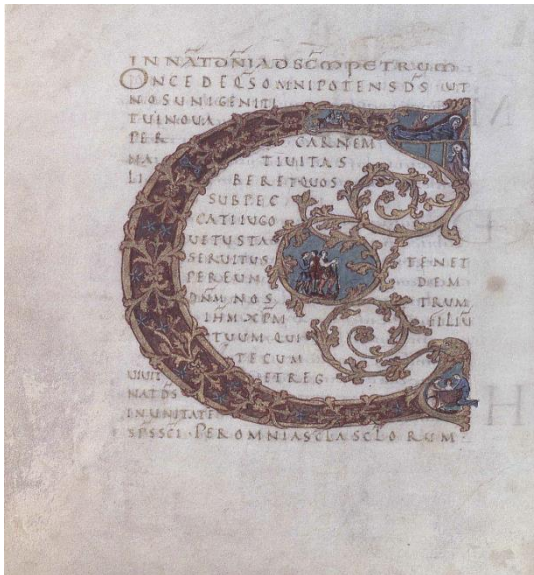


Fig. 1:  
Initiale C(oncede quaesumus), Drogo-Sacramentar (845–855), Paris,  
Bibliothèque Nationale de France, Ms. 9428, fol. 24v

<sup>16</sup> The term ›script-image‹ refers to the shape of a page containing written or notational signs (the German word for it is ›Schriftbild‹).



Fig. 2:  
Initiale D. Alburni psalter, St. Albans (1119–1123)

Here, the initial is not a mere adornment, but a fundamental part of the visual interpretation of the psalms, so much that the material texture of the script complies with the theological semantics. The magnificent and likewise ›meaningful‹ decorated letter bespeaks a break-through of the decoding look, since letter and image cannot be considered as separate entities but as a medial blending or amalgam. This kind of *notational iconicity* in which the pictorial aspects of script phenomena take the center of the stage and the spatial arrangement of the signs is transcended becomes a paradigm for visual language-games in the optic poetry of the beginning and the middle of the 20th century.

Following the steps of Stéphane Mallarmé's *Un Coup de Dés jamais n'abolira le Hasard* (1897) the optic poetry of the post war avant-garde made use of different methods to dismantle the traditional type face. Thus, the authors generated the poetic sense out of a specific design of the inscription surface.<sup>17</sup> Here too, the individual shape and the semantic layer correlate with each other, but beyond a hermetical field of reference (e.g., the Holy Scripture) and relieved from the need of figural representation as it is the case of

<sup>17</sup> An overview of many visualization strategies is offered in GOMRINGER 1996. For a more comprehensive historical retrospective view including extensive comments on different phenomena in visual poetry cf. DENCKER 2011: 56ff., 856ff.

the abovementioned initials. Instead, their involvement with spoken language and its immanent subversive potential was all the more intensive. Yet the focus on the opacity of the written signs does not imply a turning away from the sound layer, but the possibility to influence the latter through a playful use of the visual events:

in visual poetry the incompleteness of language is constitutive. [...] the fact that language is made of words means nothing else but that it is composed by notions and graphic lines. it is reliant upon physical data, i.e. data perceptible by the senses, which we cannot ignore as something contingent. language is a communication medium [*verständigungsmittel*, D.M.], but by no means a stonily fixed one. [...] under certain circumstances all objects perceptible by the senses can be a sign for something. yet the fact that in language the mere change of direction and the interruption of lines [...] enables the most differentiated sense constructions to emerge, is astonishing. the visual poetry starts out from this differentiation between the perceived and the thought; without them its intentions would be incomprehensible. in the visual poetry this differentiation between sign and concept is not something that mediates, but a poetic quality. (GAPPMAYR 1996: 145–146, translation D.M.)

The work of the Austrian writer, composer, and visual artist Gerhard Rühm ranks among the most radical inquiries into the potentials underlying this differentiated use of visible tokens. During his four-decade work on script games he explored the aesthetical aspect of notational iconicity in different formats such as typewriter-ideograms, typo-collages, letter-pictures, reading songs, and script-drawings.<sup>18</sup> In the case of the script-drawings, his repertoire of visualization strategies ranges »from an expressive word-design via the graphic meditation on a specific word through to a rhythmical-gestural action« (MON 1997: 20, translation D.M.; cf. fig. 3 and 4). The written gestures originated ›in‹ and ›on‹ the ›script-image‹ open the view for a multiple interleave of written abstraction and visual nuance, whereby during the act of writing and through the changing positions of the body »[d]eregulated ›script-images‹« (MON 1997: 20, translation D.M.) are created.

The iconicity of Rühm's script-drawings grounds on the constitutive role assigned to the design of all visible tokens in the process of the poetic generation of meaning—be it letters, lines, colors or the spatialization of each of these elements. The interaction between any visual aspects takes place in terms of an egalitarian coexistence which is deranged by the change of emphasis of the respective glances at a given object. Thus, all visual nuances are equally involved in the constitution of the ›script-image‹ and every alteration modifies the perceptibility and interpretation of the poetic content: the »turbulence of the senses« (WEISS 1996: 5, translation D.M.) originated by the interaction of script and image calls for a ludic approach to the elements distributed on the inscription surface, so that the text only emerges »out of the process of observation, of semantical exploration, of the reader's echoes« (WEISS 1996: 7, translation D.M.).

These examples of a visually playful engagement with language show that the rather epistemologically informed concept of *notational iconicity* can be broadened if we consider the visual nuances present in the described sign

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<sup>18</sup> Concerning the different techniques used by Rühm, cf. 1996.

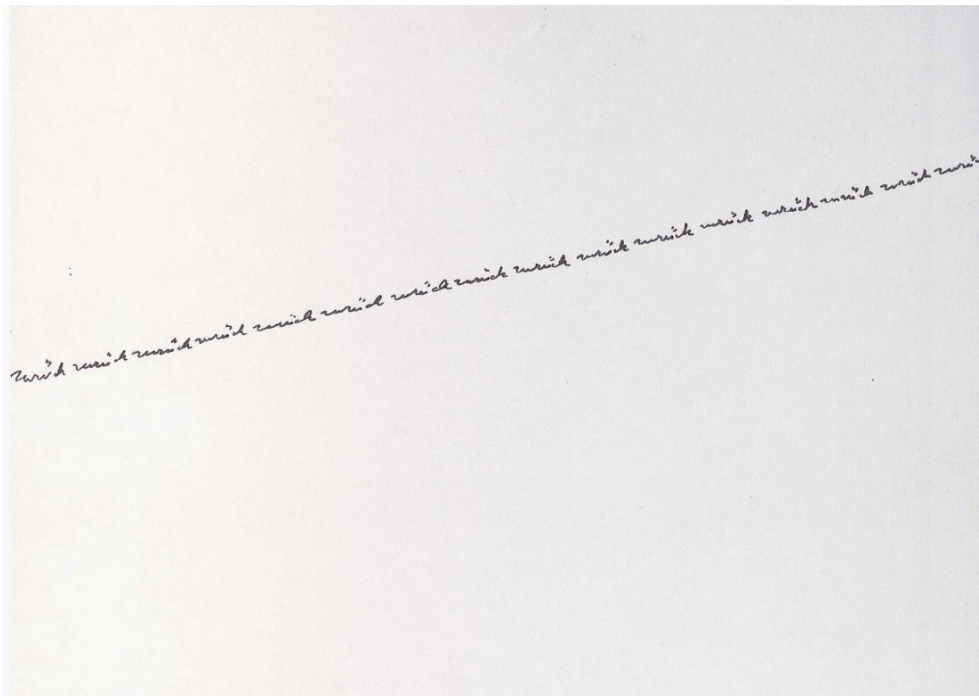


Fig. 3:  
Gerard Rühm, *zurück* (1965)



Fig. 4:  
Gerard Rühm, *ja wie...(vielleicht im sturm)* (1976)

systems and their spatialization strategies. In the case of certain works of art it would be even more suitable to invert the compounds of the notion in favor of a change of perspective concerning the medial emphasis: *iconic notational-*

*ity* would imply that visual details ›act upon‹ the design of the script signs and their spatialization providing them with a semantic surplus that grounds exclusively on the visual layer. Unlike the definitions of notation by Nelson Goodman and his interpreters suggest, such cases allow for analog components as part of visualization strategies that are used as—what we usually call—›notations‹. Hence, in order to sharpen the difference between both approaches when visual nuances play a fundamental role we could speak of a *pictorial notation*.

Such visual phenomena are associated with a different conception of how the singular elements of a writing system can be articulated. They do not correspond with an epistemological-analytical operativity, but with an aesthetical view on the sign's interaction. This *aesthetical operativity* presupposes that the singular shape of the pictorially designed elements have direct consequences for the way a given writing system can be used. From this premise, a further fundamental difference with Goodman's theory of notation arises: notations do not serve necessarily for the preservation of a work as a finished entity, which can be decomposed and recomposed. Several notations lack a strictly defined syntax and can still work as a performative instruction. They just require a perceptual approach that goes beyond analytical means. In order to illustrate the argument developed so far a look at Anestis Logothetis's musical notation shall give an insight in how the functionality of such notational phenomena could work.

## 5. Aesthetical Operativity in Pictorial Notations

While trying to transcribe the sketches for his orchestral work *Polynom* (1957) to standard notation, Anestis Logothetis (1921–1994) observed that the »stave was imposing the dotted infrastructure of its type face upon my sound conceptions and thereby distorted them or was not able to represent them at all« (LOGOTHETIS 1990: 1, translation D.M.). A year after that key event, Logothetis started working on an alternative music notation, whose first traces appeared in the score of his piece *Struktur—Textur—Spiegel—Spiel* (1959, fig. 5 and 6).

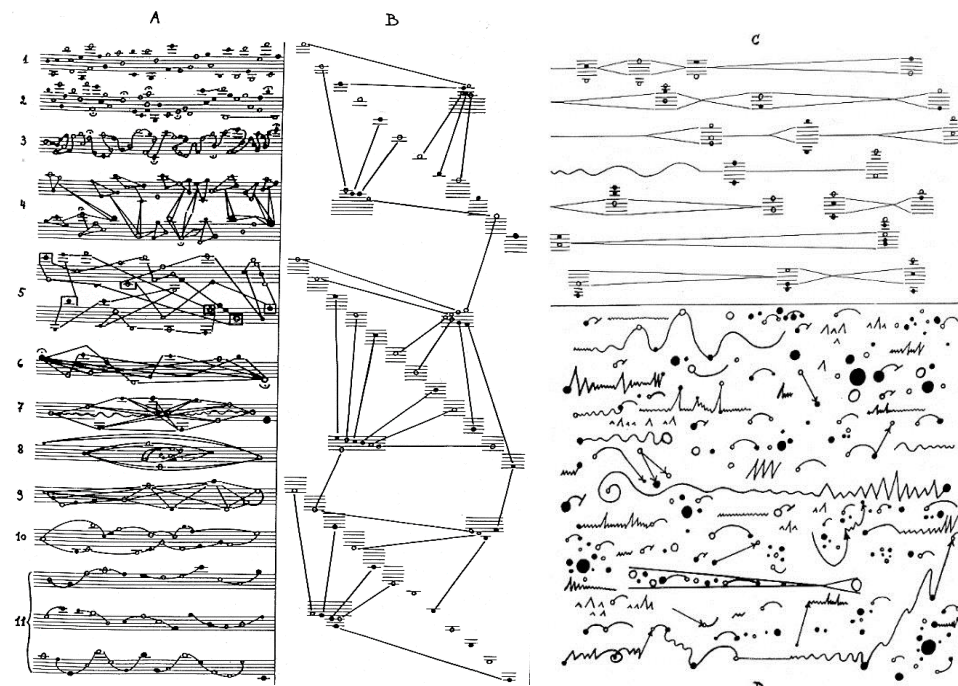
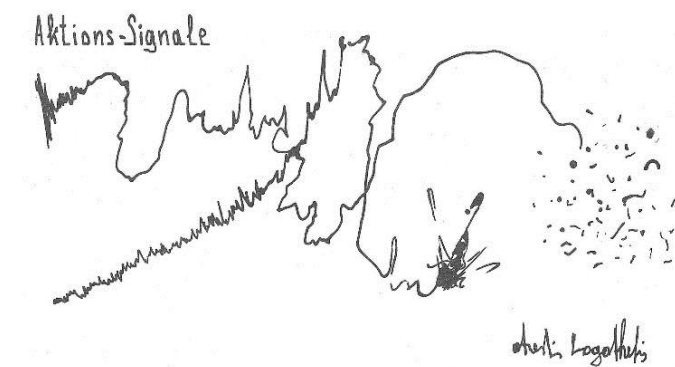


Fig. 5:  
Anestis Logotheitis, *Struktur-Textur-Spie(ge)I* (1959), © Julia Logotheitis

Sections A, B, and C of the score feature a gradual abandonment of fixed tone pitches and present a few ways to concatenate the new symbols. In addition to this, Logotheitis omits note stems, bar lines and any tempo indication. But even more relevant for the development of his own pictorial notation is the shape given to the lines in section D, which can be used for the entire material in the rest of the score and which anticipate the design of his ›Aktionssignale‹ (fig. 6) and his ›Assoziations-Faktoren‹ (fig. 7). By gradually leaving out the symbolical matrix of standard-notated scores, Logotheitis smoothes the way to creating his own notation. Right in the beginning of the 1960s he finished his first pictorial scores with the help of a sign repertoire (fig. 8) that he kept using for all his works until his death in 1994.<sup>19</sup>

<sup>19</sup> Before turning completely to pictorial notation, Logotheitis used standard notation for his early works, which include dodecaphonic or serialistic compositions (cf. HENKE 1996: 23–26; 1998: 170–175).



## Assoziations-Faktoren

- = leise - laut und kurz
- ◆ = crescendo fff diminuendo
- = leise und lang
- ⌋ = laut und kurz
- ⌋ = ff dimin. ppp cresc. ff
- ● = Klangfarbenwechsel
- ▬ = kontinuierlicher Klangfarbenwechsel
- ☀ = obertonreicher Ton oder Klang
- 〰 = vibrato ff subito pp
- 〰 = tremolo, Flatterzunge

Fig. 6 and 7:

Anestis Logothetis, *Aktions-Signale & Aktions-Faktoren*, © Julia Logothetis

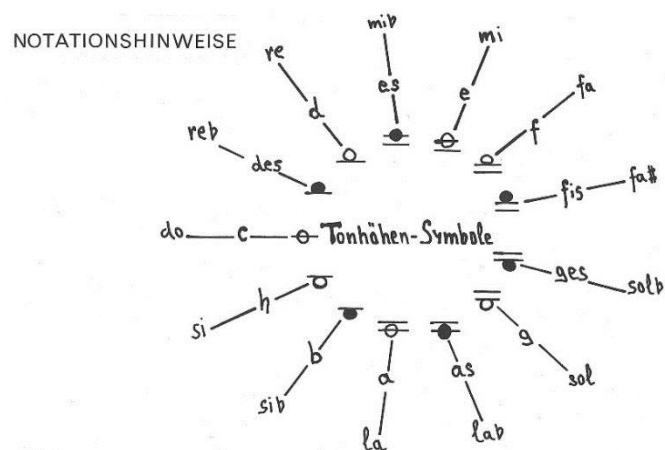


Fig. 8:

Anestis Logothesis, *Tonhöhensymbole*, © Julia Logothesis

Almost a decade after conceiving his first pictorial scores Logothetis published two articles in which he explains his own notation and reflects on aesthetic aspects of some of his scores (cf. LOGOTHETIS 1969a; 1970). These reflections culminate in the foreword of the edition of his *Impulse für Spielmusikgruppen* (1973) (cf. LOGOTHETIS 1973) and his main theoretical work *Zeichen als Aggregatzustand der Musik* (1974) (cf. LOGOTHETIS 1974). In both texts, Logothetis develops his aesthetical position concerning the relevance of sound visualization in the compositional process considering alternative ways to explore the iconic potential of music notation.

Logothetis praised the invention of the stave as a »precondition for a history of style in music« (LOGOTHETIS 1973: 3, translation D.M.)<sup>20</sup> and was convinced that »the possibility to accomplish sound organisations [*Klangorganisationen*, D.M.] of great magnitude [...] depends on the development of a music notation« (LOGOTHETIS 1974: 11, translation D.M.). However, the overcoming of tonality in the beginning of the 20th century and the consequent development of new sound structures and timbres did not come with equivalent advances in the field of notation. Innovative music ideas were coerced by an obsolete visualization strategy that had been developed over centuries to solve problems that most composers did no longer face, and that did not seem suitable to solve their new problems.

For Logothetis, the standard notation »has been created out of a monomorphic mind in order to record a single shape and to communicate it in an unmodifiable manner, that is to conserve it« (LOGOTHETIS 1972: 3, translation D.M.). Through the fixed shape of its symbols, the rules for their syntactic combination and the system of semantics in which they were used standard notation became the preferred medium to organize sound and make such structures performable.<sup>21</sup> In many ways it satisfied the expectations and it actually remains the most commonly used visualization strategy in »written music« until this day. Nonetheless, and as previously mentioned, standard notation was not able to absorb some of the most radical changes of musical aesthetics in the 20th century. One of those innovations was the rejection of conventional metrics in favor of a more flexible understanding of musical time in general and of sound duration in particular.

The symbolic rigidity of standard notation counteracts Logothetis' desire of a »continuously flowing music, whose genesis could be witnessed again and again« (LOGOTHETIS 1969b: 3, translation D.M.). For him, conventional metrics induce an artificial sound articulation that is the expression of a rational understanding of time. Logothetis reacts to this problem by developing a notation »that could be interpreted in a dynamic and irrational way, so that the musical result would be different by every interpretation« (translation

<sup>20</sup> Cf. as well LOGOTHETIS 1974: 15 and 1998a: 118.

<sup>21</sup> Standard notation is not to be understood as a finished system of musical notation, but as a non-teleological development of sound visualization in Western music starting in ancient Greece and continuing to develop down to the present day. One of the consequences of this standardization process was the possibility to visualize pitch, duration and their relationship with the help of a limited number of symbols and their spatialization on and between horizontal lines.

D.M.).<sup>22</sup> In order to achieve such flexibility it is necessary to include visual elements that do not have a correlate in a closed system of measurable parameters.

From this point of view, the main characteristics of Logothetis' notation do not reside in the design of a new repertoire of symbols (›Tonhöhen-symbole‹ and ›Assoziations-Faktoren‹), but in the way of drawing, spatializing, and combining them on the two-dimensional surface of each score (cf. fig. 9).

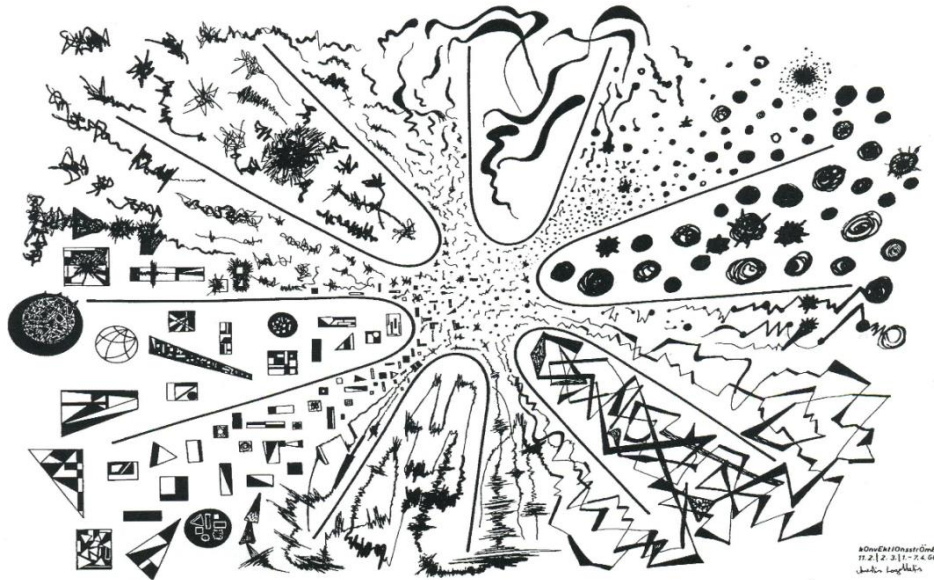


Fig. 9:  
Anestis Logothetis, *Konvektionsströme* (1968), ©Julia Logothetis

The visualization of sound flow that Logothetis was searching for was supposed to help overcome the decoding logic of standard notation. Instead of imposing upon the eye a rigid set of rules, the pictorial realization of his musical ideas should lead the performer to a more ›ludic use‹ of the score. This kind of perceptual approach could only be realized through a ›polymorphic character‹ of the score design. The notion of *polymorphy* (*Polymorphie* or *Mehrgestaltigkeit*) (cf. LOGOTHETIS 1969a: 178; 1973: 5; 1974: 19, 20, 26) synthesizes the aesthetic operation behind this notational phenomenon.

Logothetis understands the shape of the symbols and their possible concatenations as a ›binding visual impulse‹, from which every sound realization arises. In this sense, *polymorphy* aims at a manifold readability and the consequential multiple performances of the score. Following Logothetis, *polymorphy* can be achieved in five different ways, which can be combined in a given work (cf. LOGOTHETIS 1998b: 147).

<sup>22</sup> Undated and untitled typescript, pp. 1–4, here p. 2. Due to its similarity with other texts from 1966/67 the typescript could have been drafted in those years. I have been given access to the Logothetis' unpublished material in April 2012 by his daughter Julia Logothetis to whom I am very much indebted.

- One can texturize time, fix the order of the sound events, and try to scale the relationship between the visual impulses and the sounds. This would be the most rigid kind of *polymorphy*.
- Only the time of the sound events is indicated (possibly the instrumentation as well), but the order in which they are played is left to the discretion of the interpreters.
- All sound events can be played according to the ›optical assessment‹ (*optisches Ermessen*) of the visual elements, causing shifts and modifications.
- Furthermore, one can provoke ›sound associations‹ with the help of pictorial elements. The score has to be interpreted adequately and every new interpretation has to give rise to new sound shapes.
- The qualities of the signs and symbols can be reduced to quantities so that only the number of tones or tone groups is visualized, but not their duration, pitch or intensity, which have to be chosen by the performers.

In all five ways of achieving *polymorphy*, the composer is responsible for the general idea of the piece, for the ›rules of the game‹, and for the optic design. Performers have to cut out the visual material, combine it, and transform it into sound events. Despite their differences, all kinds of *polymorphy* described by Logothetis share a fundamental aspect: the ›visual nuance‹ (or pictorial detail) is crucial in the perception and realization of the score. Not only the abandonment of the stave as structuring matrix demands an active commitment of the eye, but also and especially the continuous changing shape of the same symbol from score to score or even on the same score.<sup>23</sup> This requirement is the consequence of polymorphic composing and it implies an understanding of notation that sets its focus on the iconic (or pictorial) potential of this medium. In an unpublished typescript Logothetis explains the relationship between sound and its visualization as follows:

This polymorphy of the sound result suspends every illusion of an adequate notation. The [visual, D.M.] record is only the core from which the music grows, all changing performance variations are virtually contained in it, whereas each performance represents only one single variation. A page may contain or embody more than what is sounding at the moment, and at the same time still less than what can be gotten out of the respective performance. The sound does not correspond with the image because the former needs time to unfurl. In contrast, the [visual, D.M.] record, which is stuck to a surface, can be perceived by the eye as a whole without the demand of time. This incompatibility between notation and sound [...] lead me to make use of the optic possibilities, namely to let the look move on a surface in all directions and to condition the sound result on the optic appreciation of the signs. (translation D.M.)<sup>24</sup>

<sup>23</sup> Cf. e.g. the different shapes of the symbol ›obertonreicher Ton oder Klang‹ on the score of *Labyrinthos* (fig. 9).

<sup>24</sup> Undated and untitled typescript Vienna III Hegerg. 4/9, pp. 1–4, here p. 2. Many passages of this long quote are freely translated. Therefore, I include the original quote in German: »Diese Vielgestaltigkeit des klanglichen Ergebnisses hebt jeden Schein einer adäquaten Notierung auf. Die Aufzeichnung ist nur ein Kern, aus dem die Musik erwächst, in ihr sind alle wechselnden Aufführungsvarianten virtuell enthalten, während die jeweilige Aufführung nur eine einzige Variante zum Gehör bringt. Dadurch kann ein Blatt mehr beinhalten, oder darstellen, als im Augenblick

In his search for an alternative method of putting his musical ideas on paper Logothetis exposes two fundamental problems of music notation: the articulation of time on the one hand, and the qualitative difference between the score and its sound realization on the other. In either of the two directions on a line between score and performance (from score to performance or vice versa) there is always a ›surplus‹, which is embodied, but not shown—neither as image nor as sound. The suspension of what Logothetis calls the ›illusion of an adequate notation‹ refers to the impossibility to fill in the gap between both media. In the case of standard notation, this gap is caused by the level of abstraction inherent to the symbol system and its fixation on the stave.

Unlike the requirements set by Goodman in his theory of notation and adopted by contemporary writing theories analysis and synthesis do not apply to the kind of operativity that Logothetis is proposing to the performers. Each pictorial element of the score can be interpreted in many ways and this main characteristic of Logothetis' notation leads to a definition of operativity that is intrinsically connected with the idea of potentiality. The potentiality lies in the visual quality of the pictorial elements and their spatialization on the score, which are not born simply as single sounds, but also as an entire sound structure. Thus, a pictorial notated music piece does not enable a symbolical-structural identification between score and sound realization. Instead, the correlation is given by an involvement with the materiality of the displayed elements, which result in multiple interpretations. Finally, *aesthetical operativity* does not stand for iterable sign constellations—neither letters nor classifiable images such as pictograms—, but for performative instructions in art works that are always in the making.

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erklingt; und gleichzeitig doch weniger, als durch die jeweilige Interpretation herausgeholt werden kann. Das Gehörte kann sich schon deswegen nicht mit dem Gesehenen decken, weil es zu seiner Entfaltung Zeit braucht: dagegen bietet sich die Aufzeichnung, da sie an einer Fläche haftet dem Auge als Ganzes, ohne Zeitanspruch, dar. Diese Unvereinbarkeit von Notation und Klang, wie sie nun immer stärker hervortrat, führte mich dazu, die optischen Möglichkeiten auszunützen, nämlich den Blick auf einer Fläche in allen Richtungen wandern zu lassen und das akustische Ergebnis vom optischen Erfassen der Zeichen abhängig zu machen.«

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