

# SEMIOSIS 1

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Mihai Nadin  
**The Repertory of Signs**

I. Every sign is "connected with three things, the ground, the object, and the interpretant."<sup>1</sup>

II. In *Morris'* analysis of the dimensions of semiotic<sup>2</sup> we find the semantic, pragmatic and syntactic associated respectively with the object, the interpretant and the "sign vehicle" of a sign.

III. *Bense* and *Walther*<sup>3</sup> consider the sign as a triadic relation, the mean (Mittel), the object (Objekt) and the interpretant (Interpretant) considered as domains opening the perspective to a system-theoretical approach to the sign.

It is quite evident that *ground* (*Peirce*) and *sign vehicle* (*Morris*) are not identical, but related. The same goes about the mean (*Bense*). In the first case we had the division into three branches: pure grammar, logic proper and pure rhetoric<sup>4</sup>; in the second, the "dimensions of semiotic" (semantic, pragmatic, syntactic); in the third: *repertory* (Repertoire), *sphere of objects* (Bereich) and *field of meanings* (Bedeutung)<sup>5</sup>.

A strict semiotical approach should consider both the historical development (*Peir* 1897; *Morris*, 1938; *Bense* et al. 1971. — I did not mention *F. de Saussure*, who considered the sign from a different perspective) and the systematical. The decision to restrict the analysis of sign from the perspective of the set theory only to repertory will at least prevent several possible misunderstandings.

No matter how disputable this could be, the sign is represented by a relation such as

$$S = R(M, O, I) \quad (\alpha)$$

according to *Bense*, or by a graphical representation such as

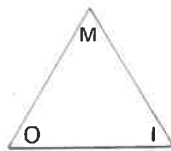


fig. 1

according to *Walther*.

At least in principle the relation *R* might be considered, up to a point, an intersect in the terms of set theory or, rather fuzzy set theory, so that a given sign expresses the relation between a mean (*m*), an object (*o*) and an interpreter (*i*). This can be shown through a pictorial representation (the *Venn* diagram). Of course, restricting ourselves to the repertory the sign should be considered as

$$s = (m, o, i) \in M \times O_M \times I_M \quad (\beta)$$

\* "Wir haben festgestellt, daß mit der Mengentheorie tatsächlich nur Repertoire-Relationen darstellbar sind, daß aber zur mathematischen Darstellung etwa der O-Bezüge und I-Bezüge unbedingt die mathematische Kategorie-Theorie (*MacLane*) sowie die Ordinalzahltheorie *John von Neumanns* besser geeignet, ja notwendig sind." (according to *Max Benses* suggestion)

function is reversible if – and only if – it is bijective, that is, injective and surjective\*. In this case the demonstration is simple: for the function  $S_{Ra}: S_R \rightarrow C$ , we have  $S_{Ra}(s') = S_{Ra}(s'')$  only when  $s' = s''$  (I) because the repertory set is defined through  $S_R = M \times O_M \times I_M$  so that every sign is given as  $s = (m, o, i) \in M \times O_M \times I_M$ ; then,  $c = S_{Ra}(s)$  (II), because each criterium is a coordinate in the space  $S_{Ra}$ . Being surjective the sets  $S_R$  and  $C$  are *equipollent*. Since conditions I and II are fulfilled, it follows that the application (function)  $S_{Rs}: S_R \rightarrow C$  also exists:  $S_{Rs} = S_{Ra}^{-1}(c)$ , corresponding to the attachment of a coordinate in the space of criteria of one or more signs ("classes", in Peirce terminology). This takes us back to the possibility of the synthesis of a sign with prescribed properties, or more precisely, the synthesis of a group of signs (repertory) with given property or a set of properties (the typical case in problems of design or in visual communication).

Analytical R semiotic is univocal. In relation to an adopted system of criteria, a sign (or an ensemble) presents itself as having a determined quality (see analysis of aesthetics made by Th. Schulz; of literature by E. Walther-Ponge, or by Marlis Gerdt-Kafka; of engraving-Dürer-by Hans Brög; of architecture-by Kiefer, Kiemle, etc.).

Synthetic R semiotic is equivocal. Its definition presupposes rules of formation, from the triadic basic sign relation to the three fundamental operations (adjunction, permutation, iteration) as well as to their possible combinations. In fact, an equilibrium exists between the synthetic function and the graphs of the generation of a sign, the function being, even if restricted to repertory, more enveloping. Finally, Bense's concept<sup>14</sup> concerning the distinction between internal and external semiosis implied in the proposed synthetic function applied to repertory.

We could imagine a sign 'device'<sup>15</sup> (not necessarily the type represented by a computer), all that would remain would be the consideration of a generative semiotic: (perhaps considered even as a cybernetical system). The problem is reduced to the determination of the succession of the operations through which we could generate a set  $C' \subset C$  so that  $S_{Rg}: C' \rightarrow S_{Ra}(\kappa)$ , where  $S_{Rg}(c) \in S_{Ra}(c)$ , that is, an indeterministic algorithm. In this case,  $S_{Rg}$  is a *generative R semiotic*.

The need for a subset  $C' \subset C$  stems strictly from practical reasons. If the device is really workable, the generative R semiotic is identical with synthetic R semiotic. The generation of signs could imply also an aleatorical (random or quasirandom) element. A computer texttransformation (like exemplified by F. Nake and M. Gardner: "Abstrakte Semiotik", starting from the beginning of Bense's "Semiotik") might be such a quasi-random basis.

The set of signs such as represented by the repertory is not homogenous. Of course we can introduce rules for ordering, or we can focus our attention on very determined subsets (like an alphabet). The power of set  $S_R$  is the same with the power of set  $S$  (this determined by Hermes and Scholz) and is in the category of the power of natural numbers ( $\aleph_0$ ). The power of the set of criteria is finite and determined through the particular definition of every semiotic. (Without entering into details I

\* The mapping  $\alpha: M \rightarrow L$  is called surjective if each element  $y$  from  $L$  has a pre-image. In this case, it is also said that  $M$  is mapped onto  $L$ .

The mapping  $\alpha: M \rightarrow L$  is called injective if each element  $y \in L$  has at most one pre-image. If the mapping  $\alpha: M \rightarrow L$  is simultaneously surjective and injective, it is called bijective, (cf. 13)

mention that Peirce's semiotic is defined through  $C = 3$ , while *Hermes'* and *Schröters'* through  $C = 2$ , or *Klaus'* through  $C = 4$ , not to speak about such hazy systems like some worked out by semiologists.) The higher the power of the set of criteria is, the more determined the signs become, and at the extreme  $C = S_R$  (i.e. the power of the set of criteria equals the power of the repertory set) every sign ceases to exist. At the other extreme, the signs become less and less determined. In a way this is the case in such a sign reality as art's. Otherwise, this defines also the situation of semiology.

From the repertory set, one can always separate a suitable subset, according to which, as the case requires, one can determine the power through diagonal processes (cf. *Cantor*). This fact should be retained. In general, any synthetic semiotic (restricted or not to repertory) is a semiotic of finite power. Semiotic analysis (restricted or not to repertory) also requires a reduction from the infinite (or the power of continuum) to the finite.

The repertory of signs could be analysed from the point of view of ordering (order relation which is antireflexive and transitive and also symmetrical), and we could also propose operations and order relations. In this case, it opens a possibility of proving the classification by means of combining various order relations.

The signs belonging to a repertory are not independent. If an analytical R semiotic has to find the types of their interdependence, a synthetic R semiotic should generate not only signs but also rules for their association. Every sign, in order to accomplish its function, must be related to other signs. Even the act of explaining one sign, isolated from a repertory, imposes the use of other signs. I call this the integrating character of the sign. It follows that no matter what its type, a sign's principle function is to integrate. Analysis and semiotic synthesis (generation) expresses, even if restricting to repertory, nothing other than the degree of integration.

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### Zusammenfassung

Die hauptsächliche Funktion des Zeichens, von welcher Art es immer sei, ist eine integratorische. Indem es zeigt, zeigt es nicht nur, sondern es definiert sich auch selbst im Kontext seiner Beziehungen. Die Repertoire-Relationen, die hier analysiert werden mit Hilfe der mengentheoretischen Konzeption, beziehen sich auf ein Tripel und können durch die Formel  $Z = R(M, O_M, I_M)$  ausgedrückt werden. Von diesem Standpunkt aus lassen sich günstige Definitionen sowohl der analytischen, synthetischen als auch generativen Semiotik in Beziehung zu dem Repertoire ( $S_{Ra}$ ,  $S_{Rs}$ ,  $S_{Rg}$ ) ins Auge fassen. Dabei ergibt sich, daß das Kriteriensystem der analytischen R-Semiotik gleichzusetzen ist mit der Definition der besonderen Semiotik wie bei Peirce, die rigoros von Bense und der Stuttgarter Schule weiterentwickelt wurde. Mathematisch faßbar wird gleichzeitig die Determination der Mächtigkeit der Menge von Zeichen (Repertoire), aber auch der von Kriterien, wobei diese Zeichen, als Ausdruck der Wahrheit, daß es nichts gibt, was nicht zeigt, nie unabhängig auftreten können, so daß jedes Zeichen sich präsentiert und existiert als in einem Repertoire integriert. Deswegen wird die Repertoire-Abhängigkeit untersucht und festgestellt, wie sie sich in der Struktur des  $S_{Ra}$ ,  $S_{Rs}$  und  $S_{Rg}$  widerspiegelt. Die Einschränkung auf Mittelbezüge beweist, daß das Mittel (wie Peirce und Bense formulierten) letztlich das eigentliche "Zeichen" sei.

Von Anfang an lag der Sinn der Wissenschaft nicht nur in der bloßen Erkenntnis der Welt, sondern auch in der Anwendung dieser Erkenntnis auf die Welt.

Zivilisation beruht heute mehr und mehr auf der Anwendung der Wissenschaft. Das heißt aber, daß immer wieder einmal neue Bereiche in unserem gesellschaftlichen, vitalen und geistigen Leben und neue wissenschaftliche Methoden erschlossen, erforscht und gelehrt werden müssen. Die allgemeine Zeichenlehre oder Semiotik ist eine solche neue Wissenschaft.

Wir, die wir das, was wir herstellen, immer auch der Wissenschaft und ihren Methoden verdanken, wünschen der neuen Zeitschrift dieser neuen Wissenschaft Glück und Erfolg.



# RAPID

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