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Review article

Sign Vehicles for Semiotic Travels: Two New Handbooks*

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Achieved purposes

Semiotik/Semiotics is a Handbook in three volumes of more than 3000 pages presenting 178 articles written by 175 authors from 25 countries, and may be considered as a representation of the general state of research in descriptive and applied semiotics compared with other single disciplines and interdisciplinary approaches including medicine, physics, chemistry, biology, psychology, sociology, economics, mathematics, logic, grammar, stylistics, poetics, musicology, aesthetics, philosophy, etc.

* Roland Posner, Klaus Robering and Thomas A. Sebeok (eds.) *Semiotik/Semiotics*, Vols. I and II. (Vol. III forthcoming). Berlin: Walter de Gruyter, 1997-1998.
Paul Bouissac (ed.). *Encyclopedia of Semiotics*. New York: Oxford University Press, 1998.

This Handbook (cited as *S/S*, followed by volume and page numbers) studies sign processes in human cultures as well in non-human animals, in their orientation, perception and communication activities, in the metabolism of all living organisms generally, therefore in the behavior of all living beings. In relation to human culture it deals with social institutions, everyday human communication, information processing in machines, knowledge and scientific research, the production and interpretation of works in literature, music, art and so forth.

With this Handbook are achieved the purposes formulated in the final report of the international workshop on ‘The systematics, history, and terminology of Semiotics’, which took place at the Technische Universität of Berlin on September 17-22, 1979. Its design goes beyond the task of proposing a comprehensive dictionary of the terminology used by specific semiotic schools and trends. This was the aim of another handbook entitled *Handbuch der Semiotik* by Winfried Nöth (1985), as well as of an encyclopedia presenting the current state of the art in semiotics, *Encyclopedic Dictionary of Semiotics* (1986b), edited by Sebeok with the help of an international Editorial Board (Paul Bouissac, Umberto Eco, Jerzy Pelc, Roland Posner, Alain Rey, and Ann Shukman). Instead *Semiotik/Semiotics* treats the systematics and the history of semiotics in an interdisciplinary perspective similarly to the goal set by Charles Morris in 1938 in the context of Otto Neurath’s project for an *International Encyclopedia of Unified Science*.

Thus *Semiotik/Semiotics*, this *Handbook on the Sign-Theoretic Foundations of Nature and Culture*, deserves a review article which does not simply limit itself to setting forth its contents and drawing up an inventory to see what is included and what disregarded. The *Handbook* is organized according to a unitary but dialogic (‘ecumenical’) semiotic conception, it makes use of a

methodology which on the occasion is exhibited and discussed, and finally it refers to a precise semiotic tradition which recognizes criticism and confutation as the basis of scientific research. In sum it is characterized by a solid theoretic framework. Consequently, the text which intends to deal with it must approach it on the its own grounds, or *iuxta propria principia*, i.e. appraise it — and on occasion compete with it — on a theoretic level. This is precisely the kind of reading we are proposing with the present article.

Volume 1 (1997) presents a theory-based outline of the entire field of semiotics and includes chapters on the systematics (I), subject matter (II and III), and methods (IV) of semiotics. Volume 1 also presents a history of Western semiotics: it begins with the presuppositions and problems of semiotic historiography (V); and then proceeds to deal with the sign conceptions of Celtic, Germanic, and Slavic Antiquity (VI), Ancient Greece and Rome (VII), and the Middle Ages (VIII).

Volume 2 (1998) completes the history of western semiotics treating the period from the Renaissance to the early 19th century (IX), as well as the 19th and 20th centuries (X). Volume 2 also includes a chapter (XI) on sign conceptions in religion, art, and everyday life in Non-Western cultures. It also complements the history of semiotics by providing a description of current trends in semiotics (XII) and of the questions, concepts and methods of each trend within its historical context in the light of the systematics developed in Chapter I.

The (forthcoming) Volume 3 is intended to present the epistemological aspects of semiotics, focusing on the relationship between semiotics and other interdisciplinary approaches as well as on single disciplines, and on the applied aspects of semiotics in contemporary society. This volume informs the reader

about semiotic institutions, organizations, and periodicals and concludes with semiotic reference sources and comprehensive (person and subject) indexes.

Unfortunately, whereas both published volumes include the whole plan of the work, a cumulative subject index and cumulative index of names are lacking. They belong to the third volume. Given that these volumes have not been published simultaneously, consulting the first two is difficult. In parenthesis, another note for a *cahier de doléans* is the discrepancy at the level of editorial rules in the Selected References section of various articles. For example, in the bibliographical entries of one article the author's whole name is given (e.g., Tembrok, Günter), while the publisher is lacking; instead, in another article we only have initials for first names, but to compensate we have the name of publishers.

Another handbook

Another handbook published in the same year as Volume 2 of *Semiotik/Semiotics* (1998): *Encyclopedia of Semiotics* (702 pages) edited by Paul Bouissac with the help of an international Editorial Committee (Göran Sonesson, Paul G. Thibault, and Terry Threadgold).

This single-volume *Encyclopedia of Semiotics* (cited as *ES* followed by page number) complements in many useful ways a rich environment of semiotic handbooks, encyclopedias, and dictionaries. These include, as says Bouissac in his 'Preface', the three-volume *Encyclopedic Dictionary of Semiotics* (Sebeok 1986b), Nöth's *Handbook of Semiotics* (1990, an enlarged and completely revised English edition of Nöth 1985), and the 'monumental' *Semiotik/Semiotics*.

The *Encyclopedia of Semiotics* is dedicated to Thomas A. Sebeok for his crucial role in the conceptual and social construction of modern semiotics (cf. *ES*: xii).

The fundamental difference in the general plan between *Semiotik/Semiotics* and the *Encyclopedia of Semiotics* is that the former is organized according to a precise semiotic conception, which, on the contrary, seems absent in the latter. Symptomatically the entry ‘Semiotics’ is not present in the *Encyclopedia of Semiotics*. However, this methodological lack does not prevent it from being rich in excellent entries.

Chapter I (‘Systematics’) of *Semiotik/Semiotics* starts with an article (by Roland Posner) on the notion of semiotics, which is also an introduction to the whole work (‘Semiotics and its presentation in this Handbook’ (*S/S*, 1: 1-14)). This article and others about the systematics and history of semiotics (i.e. Articles 1, 2, 3, 4, 5, 18, 34, 123, and 132) formed the foundational script (of more than 500 pages) for the general project. The publisher made this script available to all 175 contributors as working material so that they could each suggest modifications and produce their own articles dialogically. The foundational articles of Chapters I (‘Systematics’), II (‘General Topics I: Aspects of Semiosis’), and III (‘General Topics II: Types of Semiosis’) present semiotic and semiotic aspects, models and types in accordance with the view called recently by Sebeok ‘*global semiotics*’ (cf. Sebeok 1994a, 2001b).

Semiotics as global semiotics is present in *Encyclopedia of Semiotics*, but it is juxtaposed syncretically to narrow and partial conceptions and included among a number of different ideas of semiotics. Some *desiecta membra* of global semiotics can be found in entries such as ‘Biosemiotics’, ‘Chemical Communication’, ‘Gaia Hypothesis’, ‘Evolution’, ‘Umwelt’, ‘Sebeok’, ‘Zoosemiotics’. But entries such as ‘Communication’ and ‘Semiosis’ and the

lack of entries such as ‘Language’, ‘Microsemiosis’, ‘Endosemiosis’, ‘Mycosemiosis’, ‘Phytosemiosis’, ‘Anthroposemiosis’, reveal that the *Encyclopedia of Semiotics* sets no great store on global semiotics nor on Sebeok’s contribution to its development.

A propos ‘desiecta membra’, it is bizarre that references to Charles Morris are disseminated throughout the whole *Encyclopedia of Semiotics*, while a whole entry dedicated to ‘Charles Morris’ is lacking.

Global semiotics

As says the entry ‘Sebeok, Thomas A.’ (by John Deely) in *Encyclopedia of Semiotics* (557-559), a turning-point in the history of semiotics can be traced to the first half of the 1960s, when Sebeok enlarges the boundaries of semiotics (semiology). The latter is based on the verbal paradigm and is vitiated by the *pars pro toto* error (cf. 558). As opposed to ‘the major tradition’, Sebeok dubs this trend ‘the minor tradition’ represented by John Locke and Charles S. Peirce and early studies on signs and symptoms by Hippocrates and Galen. Through his numerous publications, Sebeok has propounded a wide-ranging vision of semiotics which coincides with the evolution of life. After Sebeok’s work — largely inspired by Charles S. Peirce, but also by Charles Morris and Roman Jakobson — both the conception of the semiotic field and history of semiotics are changed noticeably.

Semiotics owes to Sebeok its configuration as ‘global semiotics’. By virtue of this ‘global’ or ‘holistic’ approach, Sebeok’s research into the ‘life of signs’ may immediately be associated with his concern for the ‘signs of life’. In his view, *semiosis* and *life* coincide. Semiosis originates with the first stirrings of

life, which leads to his formulation of an axiom he believes cardinal to semiotics: ‘semiosis is the criterial attribute of life’. Semiotics provides a point of convergence and observation post for studies on the life of signs and the signs of life. Moreover, Sebeok’s global approach to sign life presupposes his critique of anthropocentric and glottocentric semiotic theory and practice. In his explorations of the boundaries and margins of the science or (as he also calls it) ‘doctrine’ of signs he opens the field to include *zoosemiotics* (a term he introduced in 1963) or even more broadly *biosemiotics*, on the one hand, and *endosemiotics*, on the other (see Sebeok, ‘Biosemiotics. Its roots, proliferations, and prospects’, in Sebeok 2001b). In Sebeok’s conception, the sign science is not only the ‘science qui étudie la vie des signes au sein de la vie sociale’ (Saussure), that is, the study of communication in culture, but also the study of communicative behavior in a biosemiotic perspective.

The object of global semiotics, of semiotics of life, is the *semiosphere*. This term is taken from Jurij M. Lotman (1991) but is understood by Sebeok (‘Global semiotics’ 1994a, now in Sebeok 2001b) in a far more extended sense than Lotman’s. In fact, the latter limited the sphere of reference of the term ‘semiosphere’ to human culture and claimed that outside the semiosphere thus understood, there is no communication (cf. Lotman 1991: 123-124). On the contrary, in the perspective of global semiotics where *semiosis* coincides with *life* (in this sense we may also call it ‘semiotics of life’), the *semiosphere* identifies with the *biosphere*, term coined in Russian by Vladimir Vernadskij in 1926, and emerges therefore as the *semiobiosphere*. Global semiotics is in a position to evidence the extension and consistency of the sign network which obviously includes the *semiosphere* in Lotman’s sense as constructed by human beings, by human culture, signs, symbols and artifacts, etc. But *global semiotics* underlines the fact that the semiosphere is part of a *far broader semiosphere*, the

semiobiosphere, a sign network human beings have never left, and to the extent that they are *living beings*, never will.

Article 1 (by Posner) ‘Semiotics and its presentation in this Handbook’ (*S/S*, 1: 1-14) which opens Chapter I (‘Systematics’) of *Semiotik/Semiotics*, is divided into three parts: ‘1. Eight theses on the tasks of semiotics’; ‘2. Syntactics, semantics, and pragmatics as branches of semiotics’; ‘3. The structure of semiotics as presented in the Handbook’.

All contributors accepted the eight theses as a basis for their work. In these theses, which are intended to provide a guideline for the Handbook user as well, semiotics is presented:

a) as an *object-science* which studies all types of sign processes, i.e. all events which involve signs;

b) as an *interdisciplinary approach*, giving particular coverage to the interaction between itself and sign-related disciplines and to fruitful competition with other interdisciplinary approaches — hermeneutics, Gestalt theory, information theory, systems theory, etc.; and

c) as a *metascience* which takes all sign-related academic disciplines as its domain, without being reduced to philosophy of science, but being engaged, as a science, in a dialogic relation with philosophy.

Another meaning of ‘semiotics’

We may add another meaning of ‘semiotics’ in addition to the general science of signs: that is, as indicating *the specificity of human semiosis*. Sebeok elaborates this concept in a text of 1989 ‘Semiosis and semiotics: what lies in their future?’, now Chapter 9 of his book *A Sign is Just a Sign* (1991a: 97-99). We consider it

of crucial importance for a transcendental founding of semiotics given that it explains how semiotics as a science and metascience is possible. Says Sebeok:

Semiotics is an exclusively human style of inquiry, consisting of the contemplation — whether informally or in formalized fashion — of semiosis. This search will, it is safe to predict, continue at least as long as our genus survives, much as it has existed, for about three million years, in the successive expressions of *Homo*, variously labeled — reflecting, among other attributes, a growth in brain capacity with concomitant cognitive abilities — *habilis*, *erectus*, *sapiens*, *neanderthalensis*, and now *s. sapiens*. Semiotics, in other words, simply points to the universal propensity of the human mind for reverie focused specularly inward upon its own long-term cognitive strategy and daily maneuverings. Locke designated this quest as a search for ‘humane understanding’; Peirce, as ‘the play of musement’. (Sebeok 1991a: 97)

This meaning of semiotics is implicitly connected with the general plan of the *Semiotik/Semiotics Handbook* and its typology of semiosis.

Chapter III, ‘Types of Semiosis’, which begins with the article ‘The evolution of semiosis’, by Sebeok, explains the correspondence between the branches of semiotics and the different types of semiosis — from the world of micro-organisms to the superkingdoms and to the human world and its specific semiosis, or anthroposemiosis. Thanks to the human specific modeling device called by Sebeok ‘language’ (it appears virtually certain that *Homo habilis* had language, although not speech), anthroposemiosis may be characterized as semiotics. Sebeok’s distinction between *language* and *speech* corresponds, if roughly, to the distinction between *Kognition* and *Sprache* drawn in Müller’s 1987 book, *Evolution, Kognition and Sprache* (cf. *S/S*, 1: 443).

In the world of life, which coincides with semiosis (see *S/S*, 1: 436-37), human semiosis is characterized as *metasemiosis*, that is, as the possibility of reflecting on signs. This means to make signs not only the object of interpretation not distinguishable from the immediate response to these signs, but also of interpretation understood as reflection on signs, as the suspension of response and possibility of deliberation. We may call this specific human capacity for metasemiosis ‘semiotics’. Developing Aristotle’s correct observation, made at the beginning of his *Metaphysics*, that man tends by nature to knowledge, we could say that man tends by nature to semiotics (see Petrilli 2001).

Human semiosis or anthroposemiosis is characterized by its presenting itself as *semiotics*. Semiotics as human semiosis or anthroposemiosis, can:

a) venture as far as the entire universe in search of meanings and senses, considering it therefore from the viewpoint of signs; or,

b) absolutize anthroposemiosis by identifying it with semiosis itself. Semiotics as a discipline or science (Saussure) or theory (Morris) or doctrine (Sebeok) presents itself in the first case as ‘global semiotics’ (Sebeok 1994a, 2001b) extensible to the whole universe insofar as it is perfused by signs (Peirce); whereas in the second case semiotics is limited and anthropocentric.

An oddity and two weak props

As we have already stated, the entry ‘Semiotics’ is lacking in *Encyclopedia of Semiotics* — an oddity (and not the only one) in this volume. The entries ‘Semiosis’ and ‘Sign’ (both of them by David Lidov, 561-563) do not fill in this gap. The former is simply limited to evidencing the ambiguity of the concept of

semiosis (Process or relation? Activity or passivity? Action *of* the sign or action *on* the sign?). It concludes that the notion of semiosis emerges in semiotic traditions most distant from structuralism, but the latter suggests the most concrete answer. Structuralism explains the coherence of autonomous texts and systems in terms of diagrams (Lidov is also author of the entry ‘Diagrams’, *ES*: 189-191, 572-575) that can be ascribed to them, like Greimasian squares, phrase markers, etc. (cf. 563). The entry ‘Semiosis’ gives up the definition of this notion and deals instead with the concept of dialogue, which ‘throughout the history of semiotics figures as a model for the development of ideas’ (563).

The entry ‘Sign’ in *Encyclopedia of Semiotics* opens with the trivial medieval formula ‘the sign is something that stands for something else’ (*aliquid stat pro aliquo*). And after reviewing the different meanings of sign in ordinary language and in the history of semiotics, concludes by asking if ‘semiotic theory’ does even require a definition of sign. The answer is that while physics does not define *matter*, nor biology *life*, nor psychology *mind*, semiotics, which is ‘a philosophical field’, deals with ‘the problem of the definition of sign and ongoing dialectic of exemplification and delineation that achieves no axiomatic basis’ (575).

However, as much as ‘the pedigree of the term *semiosis* is not completely clear’, as claimed in the entry ‘Semiosis’ (561), this concept plays a major role in the works of Peirce and Morris. In accord with Peirce’s conception, we may remark that the difficulty in defining sign as well as the ‘ambiguity’ of semiosis (which is at once process and relation, activity and passivity, action *of* the sign or action *on* the sign) are due to the triadic character of semiosis: sign (or representamen)/object/interpretant. As already indicated by the suffix ‘*sis*’ which signifies ‘act’, ‘action’, ‘activity’, ‘process of’, the word *semeiosis* as used by Peirce designates ‘sign activity’. This consists of a ‘tri-relative influence’, that

is, ‘a cooperation of *three* subjects, such as a sign, its object, and its interpretant’ (CP 5.484).

From ‘substitution’ to ‘interpretation’

Semiosis is an event in which something functions as a sign. We find the standard notion of semiotics in Article 1, ‘Semiotics and its presentation’, § 2 of *Semiotik/Semiotics*:

We therefore stipulate that the following is a necessary and sufficient condition for something to be a semiosis ... : *A* interprets *B* as representing *C*. In this relational characterization of semiosis, *A* is the interpreter, *B* is some object, property, relation, event, or state of affairs, and *C* is the meaning that *A* assigns to *B*. (S/S, 1: 2)

In a Peircean definition, *A* is viewed as the *Interpretant* that some interpreter uses to relate *B*, the Representamen, to *C*, the Object.

According to Sebeok (1994b: 10-14), the Object (O) as well as the Interpretant (I) are Signs. Consequently, we may rewrite O as S_{O_n} and I as S_{I_n} , so that both the first distinction and the second are resolved in two sorts of signs (cf. 12-13).

In our opinion, the sign is firstly an interpretant (cf. Petrilli 2001: I.1) in accordance with Peirce who reformulated the classic notion of *substitution*, in the medieval expression above, in terms of *interpretation*.

In fact, the Peircean terms of the sign include what we may call the *interpreted* sign, on the side of the object, and the *interpretant*, in a relation

where the interpretant is what makes the interpreted sign possible. The interpreted becomes a *sign* component because it receives an interpretation. But the interpretant in turn is also a sign component with a potential for engendering a new sign. Therefore, where there is a sign, there are immediately two, and given that the interpretant can engender a new sign, there are immediately three, and so forth as conceived by Peirce with his notion of *infinite semiosis*, which describes semiosis as a chain of deferrals from one interpretant to another.

To analyze the sign beginning from the object of interpretation, that is, the interpreted, means to begin from a secondary level. In other words, to begin from the object-interpreted means to begin from a point in the chain of deferrals, or semiotic chain, which cannot be considered as the starting point. Nor can the interpreted be privileged by way of abstraction at a theoretical level to explain the workings of sign processes. An example: a spot on the skin is a sign insofar as it may be interpreted as a symptom of sickness of the liver: this is already a secondary level in the interpretive process. At a primary level, retrospectively, the skin disorder is an interpretation enacted by the organism itself in relation to an anomaly which is disturbing it and to which it responds. The skin disorder is already in itself an interpretant response.

To say that the sign in the first place is an interpretant means that the sign is firstly a response. We could also say that the sign is a reaction: but only on the condition that by 'reaction' we understand 'interpretation' (similarly to Morris's behaviorism, but differently from the mechanistic approach). To avoid superficial associations with the approaches they respectively recall, the expression 'solicitation-response' is preferable with respect to the expression 'stimulus-reaction'. Even a 'direct' response to a stimulus, or better solicitation, is never direct but 'mediated' by an interpretation. Unless it is a 'reflex action', the formulation of a response involves identifying the solicitation, situating it in

a context, and relating it to given behavioral parameters (whether a question of simple types of behavior, e.g., the prey-predator model, or more complex behaviors connected with cultural values, as in the human world).

The sign is firstly an interpretant, a response through which, on the one hand, something else is considered as a sign and becomes its interpreted, and which, on the other, may engender an infinite chain of signs.

Consequently, the ‘ambiguity’ of the concept of semiosis discussed in the entry ‘Semiosis’ (*ES*) does not concern the term but the phenomenon of semiosis, at once a process and relation, activity and passivity, action *of* sign or action *on* sign, including sign solicitations and responses, interpreteds and interpretants.

In sum, in Peirce’s view, semiosis is a triadic process and relation whose components include sign (or representamen), object and interpretant. ‘A Sign, or Representamen, is a First which stands in such a genuine triadic relation to a Second, called its Object, as to be capable of determining a Third, called its Interpretant, to assume the same triadic relation to its Object in which it stands itself to the same Object’ (*CP* 2.274). Therefore, the sign stands for something, its object ‘not in all respects, but in reference to a sort of idea’ (*CP* 2.228). However, a sign can only do this if it determines the interpretant which is ‘mediately determined by that object’ (*CP* 8.343): semiosis is action of sign and action on sign, activity and passivity. ‘A sign mediates between the *interpretant* sign and its object’ insofar as it refers to its object under a certain respect or idea, the ground, and determines the interpretant ‘in such a way as to bring the interpretant into a relation to the object, corresponding to its own relation to the object’ (*CP* 8.332).

Article 100 of *Semiotik/Semiotics* (by Helmut Pape, 2016-2040), in §§ 2.3, ‘Objects and semiosis’, 2.3.1 ‘Form and object in semiotic causation’, and

2.3.2. ‘Interpretations and objects as final causes’ (*S/S*, 2: 2026-2028), asks two questions concerning the triadic relation among representamen, object, and interpretant: (1) How does the object as an independent stimulus determine the interpretant, this not being a case of physical causality given that physical causality is a dyadic relation? (2) Why cannot the object be reduced, e.g., to interpretant and be expelled from the semiosis model? Or in the author’s words: ‘What is semiotic about the object of the sign, why not rather concentrate entirely, e.g., on the interpretant?’. The author of this article quotes Alfred Ayer (1968: 166) who regarded the ‘obscurity’ of this concept as the greatest obstacle for a coherent account of Peirce’s theory of semiosis. Also, the author mentions Douglas Greenlee (1973) who argued that Peirce’s conception of semiosis should be developed without the concept of an object of a sign (cf. *S/S*, 2: 2026). According to the article, ‘The object is a sort of regulative idea that relates different signs (and sign processes) to one another’ (2027). This idea is called by the author ‘Principle of Objective Unification’ (POU), of which the formulation is:

A sign has an independent object, if and only if (a) we are able to bring about a situation in which some dyadic relation holds between some experience and a token of this sign which indicates the same object, and (b) there is a sequence of signs interpreting the same object as the ultimate cause of some sign (2027).

The independent object of a sign, i.e. of an interpretant, is only given in an interpretation that connects different situations of indexical experience with this object. This is the difference established by Peirce between ‘immediate’ and ‘dynamical’ object. The former is internal to the sign: it is just the idea of the object to which the sign gives rise, i. e. the object made an interpreted by an

interpretant. The latter is an external, independent object of the sign, an independent object of an interpretant and its interpreted, the reference of our interpretations, though what our objects are depends on the experiential situation we are in. The dynamical object serves as an intersubjective item that different people at different times may identify in their experience as the same (cf. 2027). The distinction between immediate and dynamical object may be used to solve problems and paradoxes such as those treated in logic and philosophy of language. We refer to scholars such as Franz Brentano, Edmund Husserl, Alexius Meinong, Gottlob Frege, Bertrand Russell, Alfred N. Whitehead, Ludwig Wittgenstein, Willard V. O. Quine, etc. (cf. *S/S*, 2, Chapter X, Article 76, ‘Sign conceptions in logic from the 19th century to the present’ by Denis Vernant, 1483-1511, and Article 77, ‘Zeichenkonzeptionen in der Sprachphilosophie vom 19. Jahrhundert bis zur Gegenwartsee’ [Sign conception in general philosophy from the 19th century to the present] by Karl-Friedrich Kiesow, 1512-1552, § 7: 1524-1529).

We have said that the independent object is a sort of regulative idea, so determination of the triadic relation by the object is not a physical determination by some physical force but a case of logic, or final causality. Consequently, we shall now be able to answer the question ‘How is it possible that the object stimulates a semiosis?’ (cf. 2017).

The questions dealt with in the article (100) on Peirce’s semiotics in *Semiotik/Semiotics* are more or less the same as those asked by Eco in *The limits of interpretation* and *Kant e l’ornitorinco* [*Kant and the platypus*]. The former searches for a regulative principle, it too intersubjective, of infinite semiosis; the latter reflects on the Peircean notions of ‘dynamical object’ and ‘ground’. Both the article on Peirce and Eco’s books are about the Kantian epistemological question ‘how is knowledge about reality possible?’ Its semiotic analogue is

‘how can we explain that the independent object of a semiosis is capable of determining a sign to bring about a second sign, its interpretant, which can be understood to be a representation of the same object’ (*S/S*, 2: 2028).

As philosophy of language semiotics cannot avoid the question, as worded by Umberto Eco, of ‘what is that something which induces us to produce signs?’, or ‘what makes us speak?’ (1997: 4. This and following Eng. trans. are our own.). As in Eco’s case, this problem may lead us to the concept of Peirce’s ‘dynamical object’, thereby inducing us to reply that it is the dynamical object ‘which pushes us to produce semiosis’: ‘we produce signs because there is something that demands to be said. Using an expression which is hardly philosophical, but effective, the Dynamical Object is Something-that-gives-us-a-kick and says “speak” — or “speak about me!”, or again, “take me into consideration”’ (5). This reply, as Eco observes, presupposes a theory of knowledge, but before we can indicate the something which induces us to produce signs as a dynamical object, *noumenon*, brute matter, it is something undetermined which arouses the attention and precedes the act of perception that is already semiotical. Eco thus resorts to Peirce’s concept of *Ground* which is not to be understood as the ‘background from which something emerges’ but as ‘something which emerges from a background that is still indistinct’ (46). Thus if we translate this term in Italian with ‘*base*’, as in Peirce 1980, ‘it would not be so much a basis of the Dynamical Object, as rather a base, a starting point, for the knowledge that we try to have of it’ (46), a sensation. Therefore, it is the ‘base’ or ‘foundation’ of the ‘non metaphysical [hypostatized] cognitive process. Differently the *Ground* would be substance, something which obscurely presents itself and becomes a *subjectum* of predications. Instead, the *Ground* itself is a possible predicate, more of an ‘it is red’ than ‘*this* is red’ (81. On this book by

Eco, see Petrilli, ‘Semiotic phenomenology of predicative judgment’, in S. Petrilli, ed., 1999c: 563-594).

The article in question in *Semiotics/Semiotics* states that, even if the independent object itself is understood as final cause unifying interpretations, there is no danger that the distinction between object and interpretant might be blurred (cf. 2028). The article quotes Peirce who, in *MS*, says that the real object of one end of semiosis is always ‘unexpressed in the sign itself’, and the object is different from the interpretant in that ‘the former antecedes while the latter succeeds the sign. The logical interpretant must, therefore, be in a relatively future tense’ (Peirce 1967: xx). This is the component in semiosis which in previous writings we have called ‘semiotic materiality’ (cf. Ponzio 1990a: 23-25): a given interpreted object retains an uninterpreted residue with respect to its interpretant, giving rise in turn to other interpretive routes. Such other interpretive possibilities must eventually be confronted with previous interpretations, especially if a relation of coexistence is not possible and a choice between two or more contrasting interpretations imposes itself.

Thanks to its ‘semiotic materiality’, the interpreted object has its own consistency, a capacity to resist just any interpretation, which the interpretant will have to take into account and adjust to. What is interpreted and becomes a sign because of this — whether it be an utterance or a whole line of conduct (verbal and nonverbal), or a written text, or a dream, or a somatic symptom — does not lie at the mercy of a single interpretant. This is so because the interpreted is open to several interpretations and is therefore the place where numerous interpretive routes intersect.

The author of Article 100 in *Semiotics/Semiotics* says something similar when he states that for every interpretant there is something independent of it

which connects it to other interpretants, the possibility of which is assumed by all interpretants. This may be expressed with the following principle:

The general purpose of a semiosis is to use signs in such a way that their immediate (internal) object can be understood as the same as the dynamical (real) object throughout the whole sequence of interpretations. (2028)

Subsequently the article draws attention to the similarity between the directedness of a representation to an independent object according to Peircean semiotics and what Franz Brentano calls ‘intentionality’. With regard to this concept some Analytic Philosophers following Roderick M. Chisholm and Elisabeth Ascombe are also mentioned, though the reference above all to Franz Brentano is interesting. In fact Brentano’s ‘phenomenological semiotic’ doctrine of intentionality (cf. S/S, 2, Chapter XII, Article 103, ‘Phenomenological semiotics’, by Sandra B. Rosenthal, 2096-2112, § 1) prepared the way for Husserl’s phenomenological analysis, who separated this notion from Brentano’s psychologism (cf. in the same article 103, 2098-2101). Husserl’s phenomenology may further contribute to answering the questions (asked, as said, both in Article 100 on Peirce and in Eco 1997: how is it possible that the object stimulates a semiosis? What is the relationship between the immediate object and the dynamical object? This has been discussed in relation to Eco’s book of 1997 in Petrilli’s above-mentioned article , ‘Semiotic phenomenology of predicative judgment’.

Semiotics must reflect upon the conditions of possibility of what Husserl calls the already given, already done, already constituted, already determined world. And this is necessary to critical analysis of the world’s current configuration, with a view to alternative planning. We might say that semiotics

carries out the overall task of what Husserl calls *constitutive phenomenology*. As he shows in particular in *Erfahrung und Urteil* [*Experience and judgement*], 1948, the aim of *constitutive phenomenology* is to clarify the entire complex of operations leading to the constitution of a *possible world*. In Article 103 of Chapter XII, *S/S*, 2, ‘Phenomenological semiotics’, a direct reference to Husserl’s posthumous book is lacking; it is included in the bibliography of Article 74, Chapter X; cf. in this article, § 12, ‘Husserl and intentionale Semiotik’, 1446-1448, and § 14, ‘Husserls intentionale Einheit von Sprache und Act’, 1449-1450). To investigate how the world is formed means to deal with the essential form of the world in general and not our real effectively existent world. This means to investigate the modeling structures and processes of the human world not simply in terms of factuality, reality and history but also in terms of potential and possibility. Such an investigation is specific also in the sense that it deals with a species-specific modality of constructing the world. In fact, unlike other animals, the human animal is characterized by its capacity for constructing innumerable possible worlds. With Thomas A. Sebeok we call the human *modeling device* of the world ‘language’. Such a capacity exists uniquely in the human species, because unlike all other species only humans are able to construct innumerable real or imaginary, concrete or fantastic worlds and not just a single world (cf. Sebeok 1991a).

Semiosis and dialogue

Another relation that can be explained is that between *semiosis* and *dialogue*. The entry ‘Semiosis’ in *Encyclopedia of Semiotics* signals this relation but fails to evidence the close connection between the two terms. The particular relation

that exists between sign and interpretant as understood by Peirce, precisely a dialogic relation, determines this connection.

The interpretant of a sign is another sign which the first creates in the interpreter, ‘an equivalent sign, or perhaps a more developed sign’ (CP 2.228). Therefore the interpretant sign cannot be identical to the interpreted sign; it cannot be a repetition, precisely because it is *mediated*, interpretive and therefore always new. With respect to the first sign, the interpretant is a *response*, and as such it inaugurates a new sign process, a new semiosis. In this sense it is a more developed sign. As a sign the interpretant determines another sign which acts, in turn, as an interpretant: therefore, the interpretant opens to new semioses, it develops the sign process, it is a new sign occurrence. Indeed, we may state that every time there is a sign occurrence, including the ‘First Sign’, we have a ‘Third’, something that is mediated, a response, an interpretive novelty, an interpretant. This confirms our statement that a sign is constitutively an interpretant. The fact that the interpretant (Third) is in turn a sign (First), and that the sign (First) is in turn an interpretant (is already a Third) contextualizes the sign in an open network of interpretants according to the Peircean principle of infinite semiosis or endless series of interpretants (cf. CP 1.339).

Therefore, the meaning of a sign is a response, an interpretant that calls for another response, another interpretant. This implies *the dialogic nature of sign and semiosis*. A sign has its meaning in another sign which responds to it and which in turn is a sign if there is another sign to respond to it and interpret it, and so forth ad infinitum. In our terminology (see Ponzio 1985, 1990b, and Ponzio, Calefato, and Petrilli 1999) the ‘First Sign’ in the triadic relation of semiosis, the object that receives meaning, is the *interpreted*, and what confers meaning is the interpretant which may be of two main types.

The interpretant which enables recognition of the sign is an *interpretant of identification*, it is connected with the signal, code and sign system. The specific interpretant of a sign, that which interprets the actual sense, is the *interpretant of answering comprehension*. This second type of interpretant does not limit itself to identifying the interpreted, but rather expresses its properly pragmatic meaning, installing with it a relation of involvement and participation: the interpretant responds to the interpreted and takes a stand towards it.

This bifocal conception of the interpretant is in line with Peirce's semiotics, which is inseparable from his pragmatism. In a letter of 1904 to Victoria Welby, Peirce wrote that if we take a sign in a broad sense, its interpretant is not necessarily a sign, but an action or experience, or even just a feeling (cf. *CP* 8.332). Here, on considering the interpretant as not being necessarily a sign, Peirce is using the term 'sign' in a strict sense. In fact the interpretant understood as a response that signifies, that renders something significant and that consequently becomes a sign cannot be anything else but a sign occurrence, a semiotic act, even when a question of an action or feeling. In any case, we are dealing with what we are calling an 'interpretant of answering comprehension', and therefore a sign.

Semiosis as mediation

In the above-mentioned article by Posner in *S/S*, 'Semiotics and its presentation in this Handbook' (vol. 1, I.1: 1-14), 'sign processes' or 'semioses' are defined as events 'which involve signs', and which 'occur only in living nature and in the cultures of higher animals' (*S/S*, 1: 1). In other words, semioses occur in all organisms or 'purposive systems' whose body forms are passed on from one

generation to the next through the genetic code (*inheritance*). Instead, their behavior is passed on from one generation to the next both through the genetic code and by learning (*tradition*) after eventual creative modification. These two types of transmission as well are sign processes, or semioses.

The article we have already cited by Sebeok in *S/S*, ‘The evolution of semiosis’ (vol. 1, III.18: 436-446), opens with the question ‘what is semiosis?’ and begins answering by citing Peirce. Sebeok observes that the Peircean description (*CP* 5.473) of semiosis or ‘action of a sign’, conceived as an irreducibly triadic process or relation (sign, object, and interpretant), focuses particularly upon the way the interpretant is produced, and thus concerns ‘what is involved in understanding or teleonomic (that is, goal-directed) interpretation of the sign’ (*S/S*, 1: 436). In terms of Posner’s description hinted at above (*S/S*: 1), semiosis requires the action of something ‘purposive’.

Both the object and the interpretant are part of an irreducibly triadic sign structure, both representative and nonrepresentative. Peirce himself underlines that the term ‘representation’ is inadequate to indicate the general reality of the sign. As he says himself, the latter is far better described in terms of ‘mediation’ (*CP* 4.3). In fact, as a general description, more than ‘represent’ the object to the interpretant, the sign mediates between the object and the interpretant. In other words, the semiotic function is best described in terms of ‘mediation’ rather than of ‘representation’ (cf. *CP* 4.3).

While the expression *aliquid stat pro aliquo*, that is, ‘something that stands for something else’, describes the sign relation in dyadic terms, Peirce’s definition evidences the irreducibly triadic structure of the sign relationship and as such places the conditions for theorizing the movement of *renvoi* and transferal that characterizes it. Thomas A. Sebeok emphasizes this aspect of Peirce’s analysis of sign structures and relations when he says:

Peirce's definition embodies the core concept of *renvoi*, or transfer, Jakobson's compressed coinage (*Coup d'œil sur le développement de la sémiotique* [1975]) for the celebrated antique formulation, *aliquid stat pro aliquo*, but it contains one very important further feature. Peirce asserts not only that *x* is a sign of *y*, but that 'somebody' — what he called 'a *Quasi-interpreter*' (CP 4.551) — takes *x* to be a sign of *y*. (Sebeok 1979: viii)

Not only is a sign a sign of something else, but 'somebody' a '*Quasi-interpreter*' (CP 4.551) assumes something as a sign of something else. Peirce further analyses the implications of this description when he says that: 'It is of the nature of a sign, and in particular of a sign which is rendered significant by a character which lies in the fact that it will be interpreted as a sign. Of course, nothing is a sign unless it is interpreted as a sign' (CP 2.308). And again: 'A sign is only a sign *in actu* by virtue of its receiving an interpretation, that is, by virtue of its determining another sign of the same object' (CP 5.569).

Semiosis considered from the point of view of the interpretant and, therefore, of sign-interpreting activity, or the process of inferring from signs, may be described in terms of *interpretation*. Peirce specifies that all 'signs require at least two *Quasi-minds*; a *Quasi-utterer* and a *Quasi-interpreter*' (CP 4.551). The activity of generating the sign and that of interpreting it, that is, *utterance* and *interpretation*, are essentially interconnected by a relation of continuity and as such describe two faces of the same thought process — which does not necessarily pass through the human brain. And regarding this last point, as clearly explained by Vincent Colapietro (1989: 19), 'to speak of a quasi-utterer in this context simply means a source from which a sign springs, while to speak of a quasi-interpreter here signifies a form into which a sign grows. There

is not necessarily anything “mental” about either this quasi-utterer or this quasi-interpreter’. In the words of Peirce:

Thought [i.e., the development of signs] is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world; and one can no more deny that it is really there, than that the colors, the shapes, etc., of objects are really there. (*CP* 4.551)

To investigate the nature of the human sign implies to investigate the interrelationship between meaning, mind and subject, which may be considered as specific and complex moments of condensation and articulation in the generation of signifying processes pervading the entire universe. Given that Peirce intended his model of sign to be general, it had to be free of all restrictive references to the human mind and function in all spheres of semiosis, including the nonhuman, as anticipated at the beginning of this paper. The general character of Peirce’s sign model emerges in the well-known passage, to which we have already referred as an example among the many, where the sign is defined as ‘an object which is in relation to its object on the one hand and to an interpretant on the other, in such a way as to bring the interpretant into a relation to the object, corresponding to its own relation to the object’ (*CP* 8.332; cf. *CP* 2.242). Also, let us remember that according to Peirce the ‘interpreter’ of the sign is transformed into the ‘interpretant’ of the sign, ‘the proper significate outcome of a sign’ (*CP* 5.473). The interpreter, the mind, or quasi-mind, ‘is also a sign’ (Sebeok 1994b: 14), exactly a response, i. e., an interpretant: an interpreter is a responsive ‘somebody’.

Organisms and semiosis

In his article ‘The evolution of semiosis’ in *S/S*, I, Sebeok continues with the question ‘what is semiosis?’ citing Morris (1946: 253), who defined semiosis as ‘a process in which something is a sign to some organism’. This definition implies effectively and ineluctably, says Sebeok, that in semiotic processes there must be a living entity, which means that there could not have been semiosis prior to the evolution of life.

For this reason one must, for example, assume that the report, in the King James version of the Bible (Genesis I:3), quoting God as having said ‘Let there be light,’ must be a misrepresentation; what God probably said was ‘let there be photons,’ because the sensation of perception of electromagnetic radiation in the form of optical signals (Hailman 1977: 56-58), that is, luminance, requires a living interpreter, and the animation of matter did not come to pass much earlier than about 3,900 million years ago. (*S/S*: 436)

Let us return to Morris’s definition. ‘Signs’, says Morris, ‘are therefore described and differentiated in terms of the dispositions to behavior which they cause in their interpreters’ (1971: 75).

In the glossary appended at the end of *SLB*, Morris gives the following definition of the expression ‘disposition to respond’: ‘the state of an organism at a given time such that under certain additional conditions a given response takes place’ (1971: 361).

We do not find a definition of the word ‘organism’ (we shall see why further on), though coherently with a broad view of semiotics it is clearly used for all living beings. Instead, the term ‘response’ is defined as ‘any action of a

muscle or gland. Hence, there are reactions of any organism which are not responses' (1971: 365). The disposition to respond is provoked by a 'stimulus', understood as 'any physical energy that acts upon a receptor of a living organism'. And continuing, Morris distinguishes between a 'reaction' and a 'response' maintaining that 'a stimulus causes a reaction in an organism, but not necessarily a response', specifying in parenthesis that a response is 'a reaction of a muscle or gland' (1971: 367).

The concept of organism as discussed by Morris is clearly situated at the level of macroorganisms, that is, of organisms endowed with 'muscles and glands'. Consequently, all microorganisms are excluded. If we confront this view with Sebeok's semiotic perspective when he maintains that semiosis and life coincide, we must conclude that in Morris's case the semiosis/life relationship is specified as follows: if semiosis cannot exist without life, life can exist without semiosis. In other words, 'life' is comprehensive of semiosis, so we cannot have semiosis without life, but 'semiosis' does not necessarily exhaust life, so that we can have life without semiosis. Also, the difference between 'reaction' and 'response' further delimits the sphere of semiosis, which is not that of any kind of 'reaction', but of a 'response' understood, as stated, as the reaction of a muscle or gland.

Morris established his criteria for identifying signs on the basis of the notions we list below. When talking about signs it is important to talk about 'criteria' and not 'definitions'. Indeed, Morris is not in favor of a definition in this case and even states that 'it seems wise not to give a general definition of "sign"' (1971: 238). Morris did not intend to define the sign, but to *establish the situations in which something may be recognized as a sign*.

This operational or pragmatic attitude towards the cognitive object demystifies the role generally assigned to definition. It is not a question of

defining the object as a condition of its knowability, but of identifying situations in which we deal with signs. Authors like Victoria Welby, originator of the trend called ‘Significs’ (see Article 104, ‘Die Signifik’[‘Significs’], by H. Walter Schmitz, *S/S* 2: 2112-2117) and the Italian philosopher Giovanni Vailati, who criticized excessive trust in the cognitive import of definition, had already worked (mutually collaborating) in a similar sense. Vailati, who promoted Peirce in Italy and supported his ‘pragmaticism’ as against William James’s ‘pragmatism’, observed that definition did not necessarily testify to our knowledge about something as evidenced by our difficulty in defining precisely that which we know best: think of the difficulties involved in defining such words as ‘hot’, ‘cold’, ‘black’, etc. (Petrilli 1988: 47-56; 1990b: 339-340; 1998: 173-219; Ponzio and Petrilli 1998).

On the basis of notions that are clearly biological, Morris 1946 formulated the two following ‘definitions’ (thus called inappropriately for the sake of convenience) — a preliminary definition and another more precise definition — ‘of at least one set of conditions under which something may be called a sign’:

1) *If something, A, controls behavior towards a goal in a way similar to (but not necessarily identical with) the way something else, B, would control behavior with respect to that goal in a situation in which it were observed, then A is a sign.*

2) *If anything, A, is a preparatory-stimulus which in the absence of stimulus-objects initiating response-sequences of a certain behavior-family causes a disposition in some organism to respond under certain conditions by response-sequences of this behavior-family, then A is a sign. (1971: 84 and 87)*

In Morris's view the living entity implied in semiosis is a macroorganism, whereas in accord with Sebeok's global semiotics it may also be a cell, or a portion of a cell, or a genoma. On electing the *living being* as the subject of behavior and interpreter in the process of semiosis, Morris constantly refers to a *whole* organism endowed with 'muscles and glands' (which is fundamental in distinguishing between 'response' and 'reaction'), and not just to a portion of an organism, such as a cell. But as we learn from Sebeok's biosemiotics, the subject of behavior and interpreter of a semiotic process 'may be only a portion of an organism' (being neither Morris's 'muscle' nor 'gland') even at a microbiological level. Despite this difference, however, in 'The evolution of semiosis', Sebeok evokes Morris (1971: 366) who defines semiosis as a process in which something is a sign to some living being. But Sebeok extends the concept of living being to somewhere before the whole organism is actually formed claiming that at some point in the chain of signs there must be life. On his part Morris extends semiosis beyond the sphere of human culture but not so far as to include the biology of microorganisms, nor obviously (for contingent reasons connected to the times) molecular biology with its recent radical advances. All the same, despite such limitations, the fact remains that for Morris general semiotics is founded in biosemiotics.

Semiosis as biosemiosis

In 'The evolution of semiosis' Sebeok examines the question of the cosmos before semiosis and after the beginning of the Universe with reference to the regnant paradigm of modern cosmology, that is the Big Bang theory. Before the appearance of life on our planet — the first traces of which date back to the so-

called Archaean Aeon, from 3,900 to 2,500 million years ago — there were only physical phenomena involving interactions of nonbiological atoms and, later, of inorganic molecules. Such interactions may be described as ‘quasi-semiotic’. But the notion of quasi-semiosis must be distinguished from that of ‘protosemiosis’ as understood by the Italian oncologist Giorgio Prodi (1977) (to whom is dedicated as a ‘bold trailblazer of contemporary biosemiotics’ the milestone volume *Biosemiotics*, edited by Sebeok and Umiker-Sebeok 1991). In fact, in the case of physical phenomena the notion of ‘protosemiosis’ is only a metaphorical expression. In Sebeok’s view, to semiosis must be assigned that which concerns life. He distinguishes nonbiological interactions from ‘primitive communication’, which refers to transfer of information-containing endoparticles, such as exists in neuron assemblies where such transfer is managed in modern cells by protein particles.

Since there is not a single example of life outside our terrestrial biosphere, the question of whether there is life/semiosis elsewhere in our galaxy, let alone in deep space, is wide open. Therefore — says Sebeok — one cannot but hold ‘exobiology semiotics’ and ‘extraterrestrial semiotics’ to be twin sciences that so far remain without a subject matter (cf. *S/S*, 1: 437).

In the light of present-day information, all this implies that at least one link in the semiotic loop must necessarily be a living and terrestrial entity, which may simply be a portion of an organism, or even an artifactual extension fabricated by a human being. Semiosis is after all terrestrial biosemiosis. A pivotal concept in Sebeok’s research as well as in the *Semiotik/Semiotics* handbook is the identification of semiosis and life. On one hand semiosis is considered as the criterial feature that distinguishes the animate from the inanimate, on the other, sign processes have not always existed in the course of the development of the universe: sign processes and the animate originated

together with the development of life. Identification of semiosis and life invests biosemiotics with a completely different role from that conceived by Umberto Eco (1975) when he refers to ‘the inferior threshold of semiotics’, or from its more reductive interpretation as a sector of semiotics which in his view is a cultural science. In Sebeok’s research semiotics is interpreted and practiced as a life science, as biosemiotics.

This conception of semiosis as biosemiosis is the object of Article 119, ‘Biosemiose’ [‘Biosemiosis’] by Thure von Uexküll in *S/S* (Chapter III: 447-456; see also ‘Varieties of Semiosis’ by Uexküll in Sebeok and Umiker-Sebeok, eds., 1991: 455-470; and Sebeok, Hoffmeyer, and Emmeche, eds., 1999). In this article, Th. von Uexküll distinguishes between three different kinds of semiosis characterized by differences in the roles of emitter and receiver. Th. von Uexküll calls these three kinds of semiosis:

- 1) *semiosis of information or signification*;
- 2) *semiosis of symptomatization*;
- 3) *semiosis of communication*.

In *semiosis of information or signification* we have an inanimate environment which acts as a ‘quasi-emitter’ without a semiotic function. The receiver, i.e., a living entity, a living system, which makes whatever it receives meaningful via its receptors, must perform all semiotic functions. In *semiosis of symptomatization* the emitter is a living being sending out signals through its behavior or posture which are not directed towards a receiver and do not await an answer. The receiver receives signals as signs called ‘symptoms’. In *semiosis of communication* signs are emitted for the receiver and must find the meaning intended by the emitter (cf. *S/S*, 1: 449-450).

Reformulating Th. von Uexküll's typology of semiosis

In our terminology and in accordance with Peirce, these three kinds of semiosis which are characterized by differences in the role played by emitter and receiver, may be reformulated in terms of differences in the roles of the interpretant sign and the interpreted sign. We can say that

1) the *interpreted* may become a *sign* only because it receives an interpretation from the interpretant, which is a response (*semiosis of information*); or

2) before its interpretation as a sign by the interpretant, the interpreted is itself an interpretant response (*symptom*) which however is not oriented to being interpreted as a sign (*semiosis of symptomatization*);

3) before its interpretation as a sign by the interpretant, the interpreted is itself an interpretant response which is now directed at being interpreted as a sign, i.e., it calls for another interpretant response (*semiosis of communication*).

Our reformulation of Th. von Uexküll's typology of semiosis, distinguished by differences in participation in interpretation by the interpreted and interpretant, presents some advantages over the conception of semiotic differences established on the basis of 'emitter' and 'receiver' participation. We believe that our reformulation:

a) emphasizes the role of the interpretant in semiosis;

b) explains the meaning of 'the inanimate quasi-interpreter' in *semiosis of information or signification* as the 'interpreted-non-interpretant' (while in *semiosis of symptomatization* the interpreted is an interpretant-interpreted which is not directed at being interpreted as a sign; and in *semiosis of communication* the interpreted is an interpreted-interpretant directed at being interpreted as a sign);

- c) identifies semiosis with the capacity for interpretation, i. e., for response;
- d) confirms the importance of the pragmatic dimension in semiosis;
- e) is in line with Th. von Uexküll's definition of biosemiotics as '*interpretation of interpretation*', or, in a word, '*metainterpretation*'.

Our reformulation employs the same terminology used by Th. von Uexküll to describe his model of biosemiotics:

Das Modell für eine biosemiotische Analyse muß das vollständige Muster des Beobachtungs- und Interpretationsvorgangs vor Augen haben, das aus folgenden fünf Teil Aspekten besteht:

- (i) einem *Interpreten* (dem beobachteten lebenden System; im endosemiotischen Bereich: eine Zelle, ein Gewebsverband oder ein Organ);
- (ii) seinem *Interpretanten* (dem Rezeptor bzw. dessen Gestimmtsein für ein spezifisches biologisches Bedürfnis);
- (iii) seinem *Interpretandum* (der Veränderung des Rezeptors, die zum Zeichen kodiert bzw. der eine Bedeutung erteilt wird);
- (iv) seinem *Interpretatum* (der Gegenleistung der Umgebung zu dem Gebrauchs- oder Signal-Verhalten [Tembrock 1975] des Effektors, dem die Bedeutungsverwertung obliegt); und schließlich;
- (v) dem *Meta-Interpreten* (dem menschlichen Beobachter, dessen signetische und signemische Deutung [= Semiose der Information und Semiose der Symptomatzation], als Übersetzungen in die menschliche Sprache, hinter dem Resultat der Beobachtung stehen). (*S/S*, 1: 456).

Semiosis of information or signification, semiosis of symptomatzation, and semiosis of communication are founded in a specific type of modeling characteristic of a specific life form. The capacity of a species for modeling is

required as an a priori for processing and interpreting perceptual input in its own way.

Thus we may say with Sebeok:

As Peirce (*CP* 1.358) taught us, ‘every thought is a sign’, but as he also wrote (*CP* 5.551), ‘Not only is thought in the organic world, but it develops there.’ Every mental model is, of course, also a sign; and not only is modeling an indispensable characteristic of the human world, but also it permeates the entire organic world, where, indeed, it developed. The animals’ *milieu extérieur* and *milieu intérieur*, as well as the feedback links between them are created and sustained by such models. A model in this general sense is a semiotic production with carefully stated assumptions and rules for biological operations. (Sebeok 1991a: 57)

Centrality of the interpretant in the ‘semiotic matrix’

Th. von Uexküll’s model is so broad as to include sign processes from microsemiosis and endosemiosis to semiosis of higher organisms through to human biosemiotic metainterpretation. This model covers most of the complete catalogue of elements postulated for semiosis in Article 5, ‘Model of semiosis’, by Martin Krampen (*S/S*, I: 248). This list includes the following 14 elements deemed necessary for a complete description of semiosis. Elements designated by a letter in parenthesis are located within the organism of the interpreter:

- 1) *the semiosis as a whole*: Z;
- 2) *the organism of the interpreter*: (O);
- 3) *the interpretandum* (‘signal’): S;

- 4) *the channel*: Ch;
- 5) *the signifier* (the signal represented in the organism): (Rs);
- 6) *the interpretant*: (I);
- 7) *the signified* (the object represented in the organism): (Rg);
- 8) *the interpretatum* ('objet'): G;
- 9) *the disposition for instrumental behavior*: (Rbg);
- 10) *the disposition for signaling behavior*: (Rsg);
- 11) *instrumental behavior*: (BG);
- 12) *signaling behavior*: (SG);
- 13) *external context*: (C);
- 14) *internal context*: (c).

On the basis of this list, a semiosis can be described in the following way:

A semiosis *Z* is a process involving a channel Ch with an interpretandum S, which is related to an interpretandum G by being perceived and represented as a signifier (Rs) within the Organism (O) of its interpreter; the signifier (Rs) then being mediated by an interpretant (I) to connect with the signified (Rg), which represents the interpretatum G within (O). Via the interpretant (I), this process of symbolizing and referring triggers dispositions for instrumental behavior (rbg) and/or signaling behavior (Rsg). These are both related to the interpretatum G and terminate, via appropriate effectors, in overt instrumental behavior BG or signaling behavior SG, the latter supplying interpretanda for a further process of interpretation. Each semiosis *Z* is surrounded by other semioses and takes place in a context C external to (O) as well as a context (c) internal to (O). (SS, 1: 321)

This complex definition of semiosis is centered on the notion of *interpretant*. In fact, as we have already stated, the interpretant mediates

between *solicitation* (interpretandum) and *response* (signaling behavior or instrumental behavior). In Peirce's view such mediation is what distinguishes a semiosis from a mere dynamical action — 'or action of brute force' — which takes place between the terms forming a pair. On the contrary, semiosis results from a triadic relation. It 'is an action, or influence, which is, or involves, a cooperation of three subjects, such as a sign, its object, and its interpretant', nor is it 'in any way resolvable into action between pairs' (CP 5.484). The interpretant does not occur in physical phenomena or in nonbiological interactions, in short, in the inorganic world. As a consequence, Morris defines semiosis as 'a process in which something is a sign to some organism' (1971 [1946]: 336). This definition according to our previous statements must not only be interpreted restrictively as referring to a whole organism, but also in a wider sense as referring to any living being or living system whatever.

The definition of semiosis quoted above and proposed in Article 5 of *Semiotik/Semiotics*, 'Model of semiosis' (by Krampen), is illustrated graphically as a 'semiotic matrix' (cf. SS, I: 252, fig. 5.1) displaying the various partial processes forming the whole semiosis Z. Semiosis is presented as a process passing through different stations, 'like a train in a rail network' (cf. SS, 1: 260), with behavioral consequences.

A rhombus at the center of the *semiotic matrix* represents the interpretant I. Two vertical lines on both sides of the rhombus (the interpretant) indicate:

on the left, the interpretandum S realized in a channel Ch and changed in interpretatum G by the interpretant (I) via the semiotic flow from the signifiers (Rs) (the signal represented in the organism) to the signified (Rg) (the object represented in the organism). (With a dashed line from G via (Rg) to I the semiotic matrix indicates that a G must first have been perceived and stored within the organism (O) before reference to it can be made);

and *on the right*, on the one hand

a) signaling behavior SG or a signal emitted for purposes of communication on the basis of the organism's signaling disposition (Rsg), which through the interpretant transforms the signifier (Rs) into an inner representation of the signal for purposes of communication;

and *on the other*,

b) overt and perceptible behavior outside which behavior when instrumental is designated by BG.

In other words, the vertical line on the left side of the rhombus representing the interpretant in the semiotic matrix indicates the perception phase of semiosis, while the vertical line on the right indicates the behavioral consequences resulting from the semiosis.

In the article 'Models of semiosis' the semiotic matrix is also used to discuss the various types of semioses postulated in the history of semiotics. Consequently, the famous 'functional cycle' described by Jakob von Uexküll (1982) — this 'pivotal model', this 'simple albeit not linear, diagram', which 'constitutes a cybernetic theory of modeling so fundamental that the evolution of language cannot be grasped without it (Sebeok 1994b: 122) — may be represented within the semiotic matrix. Jakob von Uexküll's '*Umwelttheorie*' is discussed in article 110 by Th. von Uexküll (*S/S*, 2: 2183-2191), where the 'Funktionskreis' is introduced as a model of the sign process (§ 3). In the article 'Models of semiosis' the 'functional cycle' is regarded as a section in the whole semiosis and is represented in the right side of the semiotic matrix. In the 'function cycle' illustrated by the semiotic matrix, a 'perceptual cue carrier' (*Merkmal*) (i. e. signaling behavior SG) produced by the 'objective connecting structure' (*Gegengefüge*), i. e. the interpretatum (Object) G, and represented in the organism by a 'perceptual mark' (i. e., signaling disposition, Rsg) is

translated by the interpretant into an ‘operational cue carrier’ (*Wirkmal*) (i. e., behavioral disposition, Rbg), which triggers a behavior (BG) inflicting an ‘action-mark’ onto the ‘connecting structure’ G (cf. *S/S*, 1: 252-53) .

What we find interesting is that this translation presented within the semiotic matrix clearly ‘depends’ on the interpretant, as indicated by placing the rhombus that represents the interpretant in the center.

The dialogic nature of sign and semiosis

The semiotic matrix which displays the various partial semiotic processes is used, in the same article, to illustrate graphically some other types of semiosis such as *Pavlovian conditioning*, *the inference ‘if ... then’*, *hypothesis formation*, and *a ‘chain of thought’*. In all these types of semiosis the semiotic matrix graph emphasizes the central role of the interpretant (cf. *S/S*, 1: 253-257).

Dialogue too is illustrated graphically through the semiotic matrix (cf. 260). The author of the article in question maintains that dialogue commences with signaling behavior from a sender that intends to communicate something about an object. What is not taken into account is that the ‘if ... then’ inference, hypothesis formation, and ‘chain of thought’ are dialogic forms in themselves. Contrary to Krampen’s view, for the ‘if ... then’ model or ‘chain of thought’ to have a dialogue form, it is not necessary that the ‘if ... then’ model should ‘combine with the dialogue model’ as when ‘the semiosis of the former type triggers a signaling behavior’, nor that the ‘chain of thought’ should occur in the organisms of the participants’ (260).

In inference, in the hypothetical argument, and in the chain of interpreted and interpretant thought signs generally, dialogue is implied in the relation itself

between the interpreted sign and the interpretant sign (cf. Ponzio 1985, 1990a, 1997b; Ponzio, Calefato, and Petrilli 1999). The degree of dialogism is minimal in deduction, where the relation between the premises and the conclusion is *indexical*: here, once the premises are accepted the conclusion is obligatory. In induction, which too is characterized by a unilinear inferential process, the conclusion is determined by habit and is of the *symbolic* type: identity and repetition dominate, though the relation between the premises and the conclusion is no longer obligatory. By contrast, in abduction the relation between premises and conclusion is *iconic* and is dialogic in a substantial sense, in other words, it is characterized by high degrees of dialogism and inventiveness as well as by a high-risk margin for error. To claim that abductive argumentative procedures are risky is to say that they are mostly tentative and hypothetical with only a minimal margin for convention (symbolicity) and mechanical necessity (indexicality). Therefore, abductive inferential processes engender sign processes at the highest levels of otherness and dialogism. Thus we may say that ‘abductive reasoning’ (see the excellent entry by Uwe Wirth, *ES*: 1-3) is at once ‘dialogic reasoning’.

In *Semiotik/Semiotics* a direct analysis of the concept of dialogism is lacking, and yet semiosis as evidenced in this handbook is a dialogic process. The relation between sign (interpreted) and interpretant, as understood by Peirce, is a *dialogic* relation. We have already evidenced *the dialogic nature of sign and semiosis*. In *semiosis of information or signification* (Th. von Uexküll), where an inanimate environment acts as a ‘quasi-emitter’ — or, in our terminology, where the *interpreted* becomes a *sign* only because it receives an interpretation by the interpretant, which is a response — receiver interpretation is dialogic. Not only is there dialogue in *semiosis of communication* (Th. von Uexküll), where the interpreted itself, before its interpretation as a sign by the interpretant, is an

interpretant response directed at being interpreted as a sign. But also there is dialogue in *semiosis of symptomatization* (Th. von Uexküll), in which the interpreted itself is an interpretant response (*symptom*) that is not directed at being interpreted as a sign, as well as in *semiosis of information or signification*. Dialogue does not commence with signaling behavior from a sender intending to communicate something about an object. The whole semiotic process is dialogic. ‘Dialogic’ may be intended as *dia-logic*. The *logic* of semiosis as a whole and consequently of Krampen’s semiotic matrix is *a dia-logic*. The interpretant as such is ‘a disposition to repond’ (*S/S*, 1: 259), an expression used by Krampen to describe the dialogic interaction between a sender and receiver.

Krampen’s semiotic matrix in fact confirms the connection we have established between dialogue and semiosis. In fact, it shows that the two terms coincide not only in the sense that dialogue is semiosis, but also in the sense that semiosis is dialogue, an aspect which Krampen would seem not to see. The dialogue process presented in the semiotic matrix is similar to the ‘if ... then’ semiotic process, to hypothesis formation, chain of thought, and functional cycle after Jakob von Uexküll. In the article by Krampen, the semiotic matrix illustrates dialogue with two squares which represent the two partners, that is the sender and the receiver, where each has its own rhombus representing the interpretant. Despite this division, the graphic representation of dialogue is not different from the author’s diagrams representing other types of semiosis. It could be the model, for example, of an ‘if ... then’ semiosis in which the two distinct interpretants are the premises and the conclusion of an argument in a single chain of thought.

Dialogue and the ‘functional cycle’

J. von Uexküll's 'functional cycle' is a model for semiotic processes. As such it too has a dialogic structure and involves inferences of the 'if ... then' type which may even occur on a primitive level, as in Pavlovian semiosis or as prefigurements of the type of semiosis (where we have a 'quasi-mind' interpreter) taking place during cognitive inference.

In the 'functional cycle' the interpretandum produced by the 'objective connecting structure' becomes an interpretatum and (represented in the organism by a signaling disposition) is translated by the interpretant into a behavioral disposition which triggers a behavior onto the 'connecting structure'. The point we wish to make is that in the 'functional cycle' thus described a dialogic relation is established between an interpreted (Interpretandum) and an interpretant (interpreted by another interpretant, and so forth) which does not limit itself to identifying the interpreted, but establishes an interactive relation with it.

Vice versa, not only does the 'functional cycle' have a dialogic structure, but dialogue in communication understood in a strict sense may also be analyzed in the light of the 'functional cycle'. In other words, the dialogic communicative relation between a sender that intends to communicate something about an object and a receiver may in turn be considered on the basis of the 'functional cycle' model. The type of dialogue in question here corresponds to the processes described by the 'functional cycle' as presented, in Th. von Uexküll's terminology, neither in *semiosis of information or signification* nor in *semiosis of symptomatization* but in *semiosis of communication*. Here the interpreted itself, before its interpretation as a sign by the interpretant, is an interpretant response addressed to somebody both to be identified and to receive the required *interpretant of answering comprehension*.

It is indicative of the implications of Uexküll's biosemiotic 'functional cycle' for the problem of the relation between dialogue and communication that while the entry 'Dialogue' is lacking in the *Handbook of Semiotics* by Winfried Nöth (1990), it is present in the 'Index of subjects and terms'. Here it is signaled as being treated in the context of a chapter entitled 'Communication and semiosis' (Part 3), where the 'functional cycle' is also mentioned (cf. 176-180). These pages discuss different models of communication showing how the biological models, which describe communication as a self-referential autopoietic and semiotically closed system (such as the models proposed by Maturana, Varela, and J. and Th. von Uexküll), are radically opposed to both the linear (Shannon and Weaver) and the circular (Saussure) paradigms. As reported by Nöth (cf. 180), Th. von Uexküll (1981b: 14) demonstrates that Jakob von Uexküll's biosemiotic functional cycle has this feature of autonomous closure and therefore only reacts to its environment according to its internal needs.

The theory of an autopoietic system is incompatible with a trivial conception of dialogue, whether this is based on the communication model which describes communication as a linear causal process moving from source to destination, or on the conversation model governed by the turning around together rule. Also, the autopoietic system calls for a new notion of creativity. Otherwise, one may ask with Nöth (1990:180): 'how are processes such as creativity and learning compatible with the principle of autonomous closure?'. As Maturana (1978: 54-55) would suggest, creativity and dialogic exchange as opposed to communication understood as a linear process from source to destination or as a circular process in which the participants take turns in playing the part of sender and receiver, should be conceived as 'pre- or anticomunicative interactions'.

A nonnegligible contributor to semiotics

We have already stated that in *Semiotik/Semiotics* a direct analysis of the concept of ‘dialogism’ is lacking. This weak point may be attributed to the fact that these pivotal concepts as developed by Bakhtin and his collaborators are not held in due consideration in this handbook, which nevertheless deals with the theory of signs in Mikhail M. Bakhtin and his ‘Circle’. Bakhtin’s semiotic conception is explained in Article 114 (‘Der Russische Formalismus’ [‘Russian Formalism’], by Rainer Grübel, Chapter XII, ‘Current Trends in Semiotics’, *S/S*, 2: 2233-2248) which assembles under this title various other topics, including Vladimir Propp, Lev S. Vygotskij, Gustav Fipet, Bakhtin and his Circle as well as Russian Formalism. Other Russian contributions to the study of signs such as those by Roman Jakobson, Nikolaj Trubetzkoy, Jurij M. Lotman and the Moskow-Tartu School are suitably treated (in the same chapter: 2016-2339) in Articles 115, ‘Prague Functionalism’ (by Thomas G. Winner), 116, ‘Jakobson and Structuralism’ (by Linda Waugh), and 118, ‘Die Schule von Moskau und Tartu’ (‘The Moscow-Tartu School’, by Michael Fleischer).

Article 114 considers Bakhtin’s semiotic conception with special attention for the perspective of social semiotics. This is essentially conceived by starting from a critical interpretation of formalism (Bakhtin 1975 [source by mistake dated 1973 in this article], Medvedev 1928), Freudianism (Voloshinov 1987 [1927]), Saussure’s linguistics and social psychology (Voloshinov 1973 [1929]).

Gegen Kulturphilosophie, psychologische Kulturwissenschaft und Psychoanalyse gewandt, insistiert die Psychosemiotic des Bakhtin-Kreises auf der notwendigen Verkörperung eines jeden Bewußtseinsvorgangs in Zeichen

(vor allem solchen der inneren Rede). Der Organismus als Zeichenmaterial des inneren Lebens nutzend, bildet sich das Bewußtsein im Prozeß der sozialen Kommunikation so heraus, daß nicht das Erlebnis den Ausdruck organisiert, sondern der Ausdruck organisiert das Erlebnis. Wie die Psyche ausschließlich als Semiose psychologisch erfaßt werden kann, so lassen sich auch asemiotische Handlungen nur innerhalb eines (potenziellen) Zeichenkontextes verstehen. (*S/S*, 2: 2243)

In Article 114 dialogism is mentioned in connection to the problem of the interrelationship of authorial context and reported speech (Bakhtin 1929 and Voloshinov 1929). In the forms of reported speech — direct discourse, indirect discourse, and quasi direct or free indirect discourse (Germ.: *fremde Rede*) — dialogism, as interaction between authorial speech and another's speech, appears especially in the third form (see 2244).

In *Encyclopedia of Semiotics*, we find an entry (by Anthony Wall and Clive Thomson) entitled 'Bakhtin, Mikhail M.' (*ES*: 57-59), another one (by John Fielder) entitled 'Dialogism' (191-193), 'originally a theory of language conceived by Mikhail Bakhtin in the 1920s' (191), as well as the entry 'Rabelais and his World' (527-529, by the same A. Wall and Cl. Thomson), being the title of 'an influential work (1965) by Mikhail Bakhtin through which François Rabelais became a standard bearer in Bakhtinian semiotics by means of his association with the *carnevalesque*' (527). But Bakhtin is also mentioned in the entry 'Dialogue' together with Valentin N. Voloshinov who with Pavel N. Medvedev may be counted among his closest collaborators.

Bakhtin is 'a major twentieth century cultural philosopher and critical thinker' (59). He met Pavel N. Medvedev in 1920 in Vitebsk, a lively cultural center well-known thanks to a series of artists who had lived and worked there,

including Casimir Malevich and Marc Chagall (cf. L. Ponzio 2000). After moving to Saint Petersburg, Bakhtin continued to be at the center of a circle of intellectuals, the so-called 'Bakhtin Circle'. Participants of the Bakhtin circle included, among others, the musicologist I. I. Ivan I. Sollertinskij and the biologist Ivan I. Kanaev as well as Voloshinov and Medvedev. Even if only on an ideal level, Bakhtin's brother Nikolaj may also be considered as a member of the 'Circle' (cf. Ponzio, 'Presentazione. Un autore dalla parte dell'eroe', in N. Bakhtin 1998: 7-13). Having left Russia in 1918, N. Bakhtin eventually settled in Birmingham, England, where at the University there he founded the Department of Linguistics, in 1946, and died four years later.

During the 1920s Bakhtin's work interconnected so closely with that of his collaborators that it is difficult to draw a line between them. This would seem to confirm Bakhtin's thesis on the 'semi-other' character of 'one's own word', in spite of those critics who insist on establishing ownership and authorship. Bakhtin played a significant role in writing Voloshinov's two books, *Freudianism: A Critical Sketch* (1927) and *Marxism and the Philosophy of Language* (1929) as well as in Medvedev's *The Formal Method in Literary Scholarship* (1928). He also contributed to various articles published by the same 'authors' between 1925 and 1930, as well as to Kanaev's article on a subject in biology, 'Contemporary Vitalism'. And even when the 'Circle' broke down under Stalinist oppression, with Medvedev's assassination and Voloshinov's death, the 'voices' of its various members were still to be heard in uninterrupted dialogue with Bakhtin who persevered in his research until his death in 1975.

Problems of Dostoevsky's Art was published in 1929, followed by a long silence broken only in 1963 when at last a much expanded edition appeared under the title *Problems of Dostoevsky's Poetics*. In fact, with Stalinism at its

worst Bakhtin had been banished from official culture and exiled to Kustanaj. In 1965 he published his aforementioned monograph *Rabelais and His World*. Furthermore, a collection of his writings in Russian appeared in 1975 and another in 1979, followed by various editions of his unpublished writings or by re-editions of published works, by himself or by members of the Bakhtin Circle. Since then numerous monographs have been dedicated to Bakhtin and his thought (Ponzio 1980, 1992a, 1994, 1997a; Todorov 1981; Clark and Holquist 1984; Holquist 1990; Morson and Emerson 1990; Emerson 1997).

Evaluated in terms of ‘critique’ both in a literary and philosophical sense after Kant and Marx, Bakhtin’s fundamental contribution to ‘philosophy of language’ or ‘metalinguistics’ is represented by his *critique of dialogic reason*. He in fact privileged the term ‘metalinguistics’ for his particular approach to the study of sign, utterance, text, discourse genre, as well as of the relationship between literary writing and nonverbal expression in popular culture, for example, the signs of carnival. Bakhtin’s critique of dialogic reason focuses on the concept of *responsibility without alibis* (see Bakhtin 1990, 1993 and Ponzio 1997c), a nonconventional responsibility which concerns the ‘architectonics’ of existence in its relation with the I, with the world and with others, a form of responsibility which as such cannot be transferred or delegated.

Dialogism and biosemiosis

Concerning the Bakhtinian notion of ‘dialogism’ as described in the entry ‘Bakhtin M. M.’ in *Encyclopedia of Semiotics*, Wall and Thomson state that it is ‘antiformalist’ and ‘anticanonical’, as also emerges in Bakhtin’s later essays on the novel (*ES*: 58).

We might add that, in Bakhtin's view, dialogue consists of the fact that one's own word alludes always and in spite of itself, whether it knows it or not, to the word of the other. Dialogue is not an initiative taken by self. As clearly emerges from novels by Dostoevsky, the human person does not enter into dialogue with the other out of respect, but rather and predominantly out of spite for the other. Even a person's identity is dialogic. As we read in the entry 'Dialogism' in the same encyclopedia, 'even the self cannot coincide with itself, since one's sense of the self is essentially a dialogic configuration' (*ES*: 192). The authors then quote a statement made by Bakhtin in 'Discourse in the Novel' (1934, in Bakhtin 1981: 341): 'The ideological becoming of a human being ... is the process of selectively assimilating the words of others' (*ES*: 192). They also quote a statement by Voloshinov 1973: 86: 'word is a two-sided act. It is determined equally by whose word it is and for whom it is meant. As word, it is precisely the product of the reciprocal relationship between speaker and listener, addresser and addressee', with the comment that 'communication is grounded in dialogism' (*ES*: 192).

We may explicate this relation by saying that both word and self are dialogic in the sense that they are passively involved with the word and self of the other. Self is implied dialogically in otherness, just as the 'grotesque body' (Bakhtin 1965) is implied in the body of the other. In fact, dialogue and body are closely interconnected. Bakhtin's dialogism cannot be understood separately from his biosemiotic conception of sign on which basis he criticizes both subjective individualism and objective abstraction. According to Bakhtin, there cannot be dialogism among disembodied minds. Unlike platonic dialogue, and similarly to Dostoevsky, for Bakhtin dialogue is not only cognitive and functional to abstract truth, but rather it is a life need grounded in inevitable entanglement of self with other.

Dialogue is not a synthesis of multiple points of view, indeed it is refractory to synthesis. Therefore, Bakhtin opposes dialogue to unilinear and monologic dialectics. Dialogism emerges here as another *configuration of logic* which contrasts with both formal logic and dialectic logic and their monologic perspective. All this is excellently expressed by the authors of the entry ‘Dialogism’ (*ES*: 192) when they say that the term ‘dialogic’ must be understood not only as *dialog-ic* but also as *dia-logic*:

Understood in this way, dialogism undercuts the hegemonic assumption of a singular, rational form of logic. Bakhtin does not accept the linear, teleological trajectory of simplistic dialecticism, particularly the assumption that synthesis is actually ever realizable. Final and absolute agreement is not possible. Even the self cannot coincide with himself, since one’s sense of the self is essentially a dialogic configuration. (192)

We believe that interpretation of the term ‘dialogic’ as ‘dia-logic’ validates our conviction (discussed elsewhere) that Bakhtin’s main interpreters — Holquist, Todorov, Krysinisky, Wellek, etc., — have all fundamentally misunderstood Bakhtin and his concept of dialogue (cf. Ponzio’s presentation to the 1997 Italian translation of Bakhtin 1929). And this is confirmed by the fact that they compare Bakhtin’s concept of dialogue to its formulation by Martin Buber, Jean Mukarovsky, Plato. Above all, they all understand dialogue in the abused sense of encounter, agreement, convergence, compromise, synthesis. It is symptomatic that Todorov (1981) should have replaced the Bakhtinian term ‘dialogue’ with ‘intertextuality’, and ‘metalinguistics’ with ‘translinguistics’.

In *Semiotik/Semiotics* too, dialogism, via its link with ‘*fremde Rede*’ (free indirect speech), is associated with the concept of intertextuality.

Die dritte Kategorie (*fremde Rede*) hat Julia Kristeva (1970) im Zusammenhang mit Bakhtins Dialogik zur Begründung des Begriffs 'Intertextualität' inspiriert. (*S/S*, 2: 2244)

Intertextuality reduces dialogue to a relation among utterances, while translinguistics, which unlike linguistics focuses on discourse rather than on language (*langue*), reduces the critical instance of metalinguistics to a sectorial specialization. This approach minimizes the revolutionary capacity of Bakhtin's thought — if it does not completely annul it! The 'Copernican revolution' operated by Bakhtin on a philosophical level and by Dostoevsky on an artistic level, concerns the human being as he is involved with his entire life, needs, thoughts, and behavior in the life of others, not only the human other, but all living beings.

By contrast with Kant's 'critique of pure reason' and Sartre's 'critique of dialectic reason', Bakhtin inaugurates a 'critique of dialogic reason'.

Consciousness implies a dialogic relation including a witness and a judge. This dialogic relation is not only present in the strictly human world but also in the biological. Says Bakhtin:

When consciousness appeared in the world (in existence) and, perhaps, when biological life appeared (perhaps not only animals, but trees and grass also witness and judge), the world (existence) changed radically. A stone is still stony and the sun still sunny, but the event of existence as a whole (unfinalized) becomes completely different because a new and major character in this event appears for the first time on the scene of earthly existence — the witness and the judge. And the sun, while remaining physically the same, has changed because it

has begun to be cognized by the witness and the judge. It has stopped simply being and has started being in itself and for itself ... as Well as for the other, because it has been reflected in the consciousness of the other ... (Bakhtin 1970-1971: 137)

Contrary to what Krysinisky (1984) maintains when he compares Bakhtin's concept of dialogue to Mukarovsky's, dialogue is not a mere instrument for evidencing one's own viewpoint. In Bakhtin's view, dialogue is not something one chooses to embark upon; on the contrary, it is suffered, undergone. Dialogue is not the result of an open attitude towards the other, but quite on the contrary it is the biosemiotic (and not just cultural) impossibility of closure, as emerges from any tragico-comical attempt at closure and indifference. Similarly to Dostoevsky, dialogue in Bakhtin is the impossibility of indifference towards the other. It is unindifference — even when manifested as ostentatious indifference, hostility, hatred — towards self. In fact, the other continues to count more than anything else even when unindifference degenerates into hatred. This is exactly what the novel as conceived by Dostoevsky demonstrates on an artistic level by rendering accessible 'the dialogic sphere of thinking human consciousness' (Bakhtin 1963: 9).

For Bakhtin dialogue is the embodied, intercorporeal expression of the involvement of one's body, which is only illusorily an individual, separate, and autonomous body, with the body of the other. The image that most adequately expresses this is that of the 'grotesque body' (cf. Bakhtin 1965) in popular culture, in vulgar language of the public place, and above all in the masks of carnival. This is the body *in its vital and indissoluble relation to the world and to the body of others*. The shift in focus from identity (whether individual, as in the case of consciousness of self, or collective, that is, a community, historical

language, or cultural system at large) to alterity is a sort of *Copernican revolution* in itself (see Ponzio 1997a). With such a shift Bakhtinian critique of dialogic reason calls into question not only the general orientation of Western philosophy, but also the dominant cultural tendencies that engender it.

The biological basis of Bakhtinian dialogue and ‘great experience’

As anticipated, Bakhtinian dialogue is not the result of an attitude taken by the subject towards the other, but rather it is the expression of living being’s biosemiotic impossibility of closure and indifference towards its environment with which it constitutes a whole system, called by Bakhtin *architectonics*. In human beings architectonics becomes an ‘architectonics of answerability’, a semiotic consciousness of ‘being-in-the-world-without-alibis’. It may be limited to a small sphere — i. e. a restricted life environment of the single individual, one’s family, professional, working, ethnic religious group, culture, contemporaneity — or instead it may extend, as ‘global semiotic’ (the term is Sebeok’s) consciousness, to the whole world in a planetary or solar, or even (as hoped by Victoria Welby) cosmic sense. Bakhtin distinguishes between ‘small experience’ and ‘great experience’. The former is narrow-minded experience. Instead

... in the great experience, the world does not coincide with itself (it is not what it is), it is not closed and finalized. In it there is memory which flows and fades away into the human depths of matter and of boundless life, experience of worlds and atoms. And for such memory the history of the single individual

begins long before its cognitive acts (its cognizable ‘Self’). (Bakhtin’s ‘Notes of 1950’, in Bakhtin 1996: 99. Eng trans., our own)

We must not forget that in 1926 Bakhtin authored an article in which he discussed the biological and philosophical subject. This article appeared under the name of the biologist I. I. Kanaev, but unfortunately it is not even mentioned in the entry on Bakhtin included in *Encyclopedia of Semiotics*. In any case, this article is an important tessera for the reconstruction of Bakhtin’s thought since his early studies. Similarly to the development of research by the biologist Jakob von Uexküll, in Bakhtin too we find an early interest specifically in biology in relation to the study of signs.

The article on vitalism was written during a period of frenzied activity for Bakhtin during the years 1924-29, in Petersburg, then Leningrad.

In this productive period of his life he published four books on different subjects (Freud, Russian Formalism, philosophy of language, Dostoevsky’s novel), of which only the last under his name, while the others (together with several articles) were signed by Voloshinov or Medvedev. Among Bakhtin’s early articles we find ‘Contemporary vitalism’, of 1926, published in two parts in the popular scientific Russian journal *Man and Nature* (Nos. 1 and 2), signed by his friend, the biologist Kanaev. Bakhtin’s authorship of ‘Contemporary vitalism’ has never been disputed.

Bakhtin’s life in Leningrad was very difficult. Given the increasing seriousness of his illness (osteomyelitis) he qualified for a state pension which, however, was meager. Bakhtin lived in his new friend Kanaev’s apartment for several years, from 1924 until 1927, where with his wife he occupied a big but sparsely furnished room described by Kostantin Vaginov, another friend from the ‘Bakhtin Circle’, as follows: ‘Two motley blankets / Two shabby pillows /

The beds stand side by side! But there are flowers in the window [...]. Books on the narrow shelves / And on the blankets people / A pale, bluish man / And his girlish wife' (Vaginov, 'Dva pestrykh odejala...', quoted in Clark and Holquist 1984: 99).

Kanaev contributed to Bakhtin's interest in biology.

Thanks to Kanaev Bakhtin, as he says in a note to his text 'Forms of time and the chronotope in the novel' (1937-38, in Bakhtin. 1981: 84), attended a lecture on the 'chronotope' in biology in the summer of 1925, held by the Leningrad physiologist Ukhtomsky. This lecture influenced Bakhtin's conception of the chronotope in the novel. And as Bakhtin further clarifies, 'in the lecture questions of aesthetics were also touched upon'. Ukhtomsky was also an attentive reader of Dostoevsky from whose novel the *Double* he derived his conception of the double's ghost as an obstacle to comprehending the interlocutor.

Bakhtin owes to the biological research of his time such as that carried out by Ukhtomsky, the view of the relation of body and word as a dialogic relation in which the body responds to its environment modeling its world.

From this point of view Bakhtin's research can be associated with Jakob von Uexküll's. The latter is named in Bakhtin's text signed by Kanaev as one of the representatives of vitalism. In reality, Uexküll kept away from total adhesion to vitalism just as he remained constantly critical of conceptions of the behavioristic and mechanistic type. As he was to state in his book of 1934 (cf. J. Uexküll 1967), he was not interested in how the organism-machine works but how the driver works. And Uexküll too was to find an explanation to life in the sign.

We may state, therefore, that both Uexküll and Bakhtin face the question of life in a semiotic perspective. Even if Bakhtin was to increasingly concern

himself with problems connected with the literary sign, his dialogism is conceived in the context of research in biology, physiology (precisely the study of the central nervous system — Petersburg was one of the world centers in this field), physics, as well as in psychology and psychoanalysis. In particular, his concept of dialogism cannot be understood if it is not placed, with Uexküll's research in biology, on the line of development that leads to the contemporary field of biosemiotics (cf. Article 110, *S/S*, 2: 2189-2190).

All this enables a better understanding of the implications involved in the following comment from above-mentioned Article 114 (*S/S*, 2: 2244):

Bakhtin (1973 [but 1975]) dialogische Konzeption der 'fremde Rede', seine Vorstellung von der Semiose als Grenzprozeß, ist geeignet, die systemimmanente Analysemethodik der semiotik aufzubrechen. Seine Studien zur raumzeitlichen Konfiguration der Semiose unter dem Stichwort 'Chronotop' haben eine Neubewertung des Verhältnisses temporaler und lokaler Qualitäten von Zeichen eingeleitet.

In 'Contemporary Vitalism' Bakhtin's criticism of vitalism, that is, the conception which theorizes a special extramaterial force in living beings as the basis of life processes, is turned against Henry Bergson and specifically against the biologist Hans Driesch. The latter stated the difference between life and non-life and interpreted the organism's homeostasis in terms of radical autonomy from its surrounding environment. On the contrary, in his description of the interaction between organism and environment, Bakhtin, opposing the dualism of life force and physical-chemical processes, maintains that the organism forms a monistic unit with the surrounding world.

In his works of the 1920s Bakhtin criticizes both the vitalists and the reflexologists, as well as both Freudianism and mechanistic materialism (for instance the mechanistic view of the relation between base and superstructure). In Bakhtin's view, each of these different trends are vitiated by false scientific claims which underestimate the dialogic relation between body and world, which results in either dematerializing the living body or physicalizing it in terms of mechanistic relations. Bakhtin's reflection on signs is fundamental to such a critique. Reference to signs contributes to an understanding of both living and psychic processes as well as historical-cultural relations, such as that between base and superstructure. Another contribution to an adequate understanding of these processes ensues from replacing both unilinear and conclusive mechanical dialectics with the dialogic model. Jakob von Uexküll's research develops in the same way. For both Bakhtin and Uexküll the process under examination is a semiotic process. Though Uexküll does not use the dialogic model explicitly, we have seen above how it is central to his famous 'functional cycle'.

Dialogism and the 'Rabelaisian world' as the 'world of biosemiotic consciousness'

If we fail to take into account Bakhtin's global (his 'great experience') and biosemiotic view of the complex and intricate life of signs, we cannot understand the role carried out by his category of 'carnavalesque' as formulated in his study on Rabelais.

What carnival is for Bakhtin, he tells us himself in *Rabelais*. He uses this term to refer to that complex phenomenon, present in all cultures, formed by the system of attitudes, conceptions and verbal and nonverbal signs oriented in the

sense of comicality and joyous living. Carnival, therefore, does not only concern Western culture, nor the Russian spirit, but any culture at a world level insofar as it is human.

Encyclopedia of Semiotics dedicates an entry to ‘Rabelais and his world’. This corresponds to the title of the English translation. As the two authors (A. Wall and Clive Thomson) of the entry observe, this title ‘does not convey the same information as the original Russian, which can translated more literally as “The work of François Rabelais and popular culture during the Middle Ages and the Renaissance”’ (*ES*: 528). The original title stresses the intricate connection between Rabelais’s work, on the one hand, and the view of the world as elaborated by popular culture (its ideology, its *Weltanschauung*) as it evolves from Ancient Greek and Roman civilization to the Middle Ages and Renaissance, on the other. In Western Europe this time is followed by the significant transition into bourgeois society and its ideology, which is subtended by the conception of bodies as separate and reciprocally indifferent entities. Bodies thus described have two things in common: they are all evaluated according to the same criterion, that is, the capacity for work; and, furthermore, they are all interested in the circulation of goods, work included, to satisfy the needs of the individual. This ideology continues into Stalinist Russia which coincides with the time of Bakhtin's writing, and into the whole period of real socialism which only considers work and the capacity for production as community factors, i.e., as the sole elements connecting individuals. Therefore, beyond this minimal common denominator the latter remain reciprocally indifferent and separate.

What a number of critics have pointed out as questionable ‘binarism’ (cf. *ES*: 528) is in fact the expression of a well-founded monistic conception of life which crosses the whole of Bakhtin’s works. Rabelais takes this conception,

which is indicative of a *naive* biosemiotic consciousness, from medieval popular culture, but it can also be found in all manifestations of the *carnavalesque*, including the forms of ‘carnivalized literature’ of all peoples and all times. The carnivalesque participates in ‘great experience’, understood as offering a global view of the complex and intricate life of bodies and signs. This conception emphasizes vital bodily contact showing that the life of everybody is in the life of others, with which is underlined the bond uniting all living beings. This is a ‘religious’ (from Latin *religo*) view of the existent. It highlights bodily excess with respect to specific functions as well as sign excess with respect to a specific meaning: signs and bodies — bodies as signs of life — are ends in themselves. On the contrary, the minor and more recent ideological tradition is vitiated by reductive binarism which sets the individual against the social, the biological against the cultural, spirit against body, physical-chemical forces against life forces, the comic against the serious, death against life, high against low, the official against the non-official, public against private, work against art, work against non official festivity. Through Rabelais Bakhtin recovers the major tradition and criticizes the minor and recent conception of individual body and life, which is inherent in capitalism as well as in real socialism and its metamorphoses. Dostoevsky's polyphonic novel is in line with this major tradition in *Weltanschauung*, as Bakhtin demonstrates in the second edition (1963) of his 1929 book.

So Wall and Thomson rightly claim that:

the *carnavalesque* is first and foremost for Bakhtin a chronotope (a theoretical and critical construct used to gauge specific forms of time and space within a culture). ...

... In this respect, the *carnavalesque*, the social and artistic mechanism by which a chronotope can be constituted for this coming together of otherness, must be linked with both an individual's and society's memory. Otherness can be encountered creatively only from within a strong sense of the self, which cannot exist without memory. (*ES*: 528)

We have attempted to demonstrate that this memory is the immediate biosemiotic 'great experience' (in space and time) of indissoluble relations to others lived by the human body, and represented in ancient forms of culture as well as in carnivalized arts: however, the sense of such experience is anaesthetized in the 'small', narrow-minded, reductive experience of our time.

To the entry 'Rabelais and its world', we must add that Bakhtin's text on Rabelais (1965) is an organic part of his complete works, including his books signed by Voloshinov and Medvedev.

The distinction made in *Freudianism* (Voloshinov 1987 [1927]) between 'official ideology' and 'non official ideology' is developed in *Rabelais* in relation to Humanist and Renaissance literature, considered in its vital link with the low genres of Medieval comico-popular culture.

The focus in *Marxism and Philosophy of Language* (Voloshinov 1973 [1929]) on the sign in general and not only the verbal sign is also developed in *Rabelais* through analysis of the transformation of carnival signs, verbal and nonverbal, into high European literature.

Too, it is significant that when Bakhtin (1929) returned to his book on Dostoevsky for the 1963 edition, he was to integrate it with a chapter on the genesis of Dostoevsky's polyphonic novel whose roots are traced back to the serio-comical genres of popular culture. The polyphonic novel is considered as the greatest expression of 'carnivalized literature'. Relatedly to *Rabelais*,

Bakhtin also works on the prehistory of the novelistic word which he identifies in the comicality and parodization of popular genres. Also the conception of sign as plurivocal, the expression of centrifugal forces in linguistic life, especially when a question of verbal signs, is further developed in his analyses of the ‘language of the public place’ and of the double character of vulgar expression which is once laudatory and offensive.

A close connection is evident between Bakhtin’s reference (in Voloshinov 1973 [1929]) to Dostoevsky’s notes on an animated conversation formed of a single vulgar word used with different meanings and his analyses, in *Rabelais*, of the ductility and ambiguity of sense in the language of the grotesque body and its residues, remembering the complex phenomenon of carnival.

Rabelais occupies a place of central importance in the overall architectonics of Bakhtin’s thinking. In contrast with oversimplifying and suffocating interpretations of Marxism, Bakhtin works on Marx’s idea that the human being only comes to full realization when ‘the reign of necessity ends’. Consequently, a social system that is effectively alternative to capitalism is one which considers *free time, available time*, and not work time, as the *real social wealth* (see Marx 1974 [1857]). In Bakhtin’s language this is the ‘time of non official festivity’, which is closely connected to what he calls the ‘great time’ of literature.

Today’s world of global communication is dominated by the ideology of production and efficiency. This is in complete contrast with the carnival worldview. Exasperated individualism associated with the logic of competition also characterizes the world of global communication. However, as much as production, efficiency, individualism, competition now represent dominant values, the structural presence of the grotesque body founded on intercorporeity, involvement of one’s body with the body of others, cannot be ignored. The human being’s vocation for the ‘carnavalesque’ has resisted. Literary writing

testifies to this. Indeed, in Orwell's *1984*, the ultimate resistance to a social system dominated by the values of production and efficiency is offered by literature. In this sense we may say that literature (indeed art in general) is and always will be carnivalized.

To conclude: modeling and dialogism are pivotal concepts in the study of semiosis. Communication, information or signification, and symptomatization are all forms of semioses that presuppose modeling and dialogism. This is particularly evident if, in accordance with Peirce (who reformulates the classic notion of *substitution* in terms of *interpretation*), we consider the sign firstly as an interpretant, i.e. a dialogic response foreseen by a specific type of modeling.

Signs and bodies

Articles 5, 'Models of semiosis', and 18, 'The evolution of semiosis', in *S/S*, 1, offer basic concepts for an analysis of sign processes. The entire sign process takes place in a biological, social, or technical *medium*; it must have a *channel* of access to the object interpreted, and a *code* to interpret it. Articles 6-16 examine the various channels and media, analyzing the concept of 'code' and its applicability in the different channels and media.

Another important semiotic concept is the notion of *source*. In our reformulation of Th. von Uexküll's typology of semiosis, we stated that in *semiosis of information* the *interpreted* becomes a sign only because it receives an interpretation from the interpreter. This may be a whole living organism or a portion of an organism such as a cell. Now we may add that in *semiosis of information* the sources are *inorganic objects*, which may either be natural inorganic objects or manufactured inorganic objects. On the contrary, in

semiosis of symptomatization and in *semiosis of communication* the sources are organic substances or living beings (organisms or components) belonging to *Homo Sapiens* or *speechless creatures*. (On the typology of sign sources, see Sebeok 1991a: 25-26. In this text Sebeok refers especially to the sources of *communication* as a criterial attribute of all living things — whole organisms as well as their parts. However, his typology also includes sources of the two kinds of semiosis which together with Th. von Uexküll we are denominating semiosis of *information* and semiosis of *symptomatization*).

Moreover, it is important to remember that in *semiosis of symptomatization* the interpreted sign is already an interpretant response before being interpreted as a sign by an interpretant. However, this response is not oriented to being interpreted as a sign, that is, it does not come to life for the purpose of being interpreted. On the contrary, in *semiosis of communication* where too the interpreted is already an interpretant response before being interpreted as a sign by the interpretant, this interpretant response is intended to be interpreted as a sign.

When an organism or a machine takes an object as a sign of another object, it must have a ‘channel’, a passageway to access it. Possible channels are gases, liquids, solids with regard to matter; they are chemical and physical with regard to energy; and concerning the later, channels may be acoustic (air, water, solids) or optical — reflected daylight or bioluminescence, etc. (see Sebeok 1991a: 27-28). Articles 6-11 of *S/S* examine the optic (Art. 6, by Klaus Landwehr), acoustic (Art. 7, by Gerhard Strube and Gerda Lazarus), tactile (Art. 8, by Kerbert Heuer), chemical (Art. 9, by Jürgen Kröllner), electric and magnetic (Art. 10, by Peter Moller), and thermal (Art. 11, by Kurt Brück) channels. Semiosis may engage several channels, as demonstrated by Article 12 ‘Die Organisation von Augenbewegungen: Fallstudie einer mehrkanaligen Semiose’ (‘The

Organization of eye movements: A case study of multichannel semiosis’, by Niels Galley) and Article 13, ‘Body behavior as multichannel semiosis’ (by Riccardo Luccio) which investigates the simultaneous use of more than one channel in human communication.

‘Medium’ can be used as a synonym of ‘channel’ (see Sebeok 1991a: 27), but *medium* is also the world in which semiosis takes place. It may be a biological, social, or technical medium. In this double sense which connects *medium* to *model* and *modeling*, Article 14, ‘Technische Medien der Semiose (‘Technical media in semiosis’, by Karin Böhme-Dürr), and Article 15, ‘Social media of semiosis’ (by Terry Threadgold), examine semiosis in the world of technical instruments and social institutions. As discussed in Article 16 ‘Codes’ (by Gavin T. and William C. Watt) and Article 17 ‘Kodewandel’ (‘Code change’, by Rudy Keller) the concept of code is formed differently and applied differently in the various channels and media. The latter bases its analysis of code change on the following code typology:

- (1) Natürliche Kodes, die in der belebten Natur vorkommen und dem Sender wie dem Empfänger angeboren sind; Bientanz, Balzlaute, Farbsignale usw.
- (2) Künstliche Kodes, die von Menschen willentlich geschaffen wurden: Flaggenkode, Verkehrszeichen, Rangabzeichen, Computersprachen usw.
- (3) Kodes ‘der dritten Art’ ... , die nichtintendierte Ergebnisse menschlichen Handelnes sind: sogenannte natürliche Sprachen, bestimmte Arten, sich zu kleiden, bestimmte Arten, Wohnzimmer einzurichten, usw. (*S/S*, 1: 414)

All articles in this Chapter (II) deal with the connection between signs and bodies, *signata* and *signantia*, media/channels and *significata*, semiosis and materiality. Materiality of the signans (cf. Rossi-Landi 1992a: 271-299; Petrilli

1990a: 365-401) is not limited to extrasign materiality, physical materiality (the body of the signans and its channel) and instrumental materiality (nonsign bodily residues of nonverbal signs, i.e. their nonsign uses and functions: see Rossi-Landi: 1985a: 65-82). More than this, materiality of the signans is *semiotic materiality*, and in the sphere of anthroposemiosis it is also *semiotic materiality*. Semiotic materiality is historico-social materiality at more or less high levels of complexity, elaboration and/or articulation (elaboration materiality). It is ideological materiality, extra-intentional materiality, that is, objectivity independent from consciousness and volition, as well as signifying otherness materiality, that is, the possibility of engendering other signata than the signatum of any specific interpretive route (see Ponzio 1985, 1990a: 15-61; Ponzio, Calefato, and Petrilli 1999: 42-45). Signs are bodies. But the physical object may be transformed into a sign while still belonging to the world of physical matter thanks to ‘sign work’, to use Ferruccio Rossi-Landi’s terminology (on this subject see the entry ‘Rossi-Landi, Ferruccio’, by Jeff Bernard, *ES*: 547-549; on the relationship between Rossi-Landi and Charles Morris, see Article 113, by Roland Posner, *SS*, 2: 2222-2223, and Petrilli 1992). As a sign, the physical body acquires meaning engendered in the relation to something else, it defers to something external to itself, it reflects and refracts another reality from itself.

Signs also are particular, material things; and, [...] any item of nature, technology, or consumption can become a sign acquiring in the process a meaning that goes beyond its given particularity. A sign does not simply exist as a part of reality — it reflects and refracts another reality (Voloshinov 1929, Eng. trans.: 10).

We propose the following distinction: the expression *semiotic materiality* for materiality acquired by something which has become a sign in a world modeled by living beings where sign processes are languageless; instead, *semiotic materiality* where we may presuppose a world modeled by language, i. e. a human world.

As Marx suggested, ‘from the start the “spirit” is afflicted with the course of being “burdened” with matter, which here makes its appearance in the form of agitated layers of air, sounds, in short, of language’ (Marx and Engels 1968 [1845]: 42). Here language is ‘agitated layers of air, sounds’: this is about its physical materiality. But language is also human consciousness and the organization of human life: this is about the semiotic materiality of language as human primary modeling. ‘Language is as old as consciousness, language *is* practical consciousness that exists also for other men, and for that reason alone it exists for me personally as well’ (42). Language is ‘the immediate actuality of thought ... Neither the thought, nor the language exist in an independent realm from life’ (Marx and Engels 1968 [1845]: 503-504. See also §29, ‘Die Semiotik der Warenwelt bei Marx’, 1456, in Chapter X, *S/S*, 2: 1428-1461; and the entry ‘Materialistic semiotics’, by Eric Louw, *ES*: 393-396).

As a *body* the sign is *material* in a *physical* sense; as *sign* it is material in a *semiotic* sense and as human historico-social matter it is material in a *semiotic* sense. In human worlds modeled by language, a sign is a sign because of its historico-social materiality. It is this kind of materiality that interests us when a body is taken into consideration and studied as a human sign, that is, in a semiotic framework.

Decodification and interpretation

‘Code’ is a much-discussed notion in semiotics. The ‘semiotics of code’ is surpassed or absorbed now by the ‘semiotics of interpretation’. The expression ‘semiotics of code’ alludes to a general model of sign according to which messages are formulated and exchanged on the basis of a code that is defined and fixed antecedently to the actual use of signs. And given that the code is based on a two way correspondence between *signifiant* (or *signifier*) and *signifié* (or *significatum*), it only calls for decodification without involving the risks of interpretation. Code semiotics ensues from a distorted interpretation of Saussure and reformulates the information, or mathematical, theory of communication in terms of the Saussurean sender/receiver model (see Shannon and Weaver 1949; on the relationship between semiotics and information theory, see Article 125, ‘Semiotik und Informationstheorie’, by Frank Helmar, in *S/S*, 3, Chapter XIII). As such code semiotics is connected with a notion of communication that describes communicative interaction in terms of an object that transits from one place to another. In his book of 1961, Rossi-Landi (1998 [1961]) takes a clear stand against conceiving communication in terms of a postal package sent off by one post-office and received by another one.

This model appears ever more inadequate in the light of Peirce’s ‘semiotics of interpretation’ (but also Bakhtin’s philosophy of language: see Ponzio, ‘Semiotics between Peirce and Bakhtin’, in Ponzio 1990a: 251-273), and social-cultural transformations which tend towards new signifying practices that are intolerant of polarization between code and message and weaken the code’s hegemony over the multi-voicedness and multi-availability of sign. Meaning in semiotic processes is inseparable from the work of translation carried out in the process of interpretation, to the point that with Peirce we may state that signs do not exist without another sign acting as interpretant.

Sebeok (1991a: 27-29) explains the notions of *encoding* and *decoding* in term of *transduction*. Transduction consist of a series of transformations on the side of the source and of the destination, effected on the basis of the *interpretation* of a probable homology between meaning and an externalized serial string, as in speaking or writing or gesturing. Transduction as encoding or conversion by the source becomes decoding or reconversion on the side of destination, effected before the message can be interpreted:

‘Transduction’ refers to the neurobiological transmutation from one form of energy to another, such as a photon undergoes when impinging on the vertebrate retina: we know that it entrains impulses in the optic nerve that change rhodopsin (a pigment in the retinal rods of the eyes), through four intermediate chemical stages, from one state to another. A message is said to be ‘coded’ when the source and the destination are ‘in agreement’ on a set of transformation rules used throughout the exchange. (1991a: 28)

As to the notion of ‘code’, a debate was conducted in Italy on its uses and abuses from approximately the mid 1970s onwards (see Eco 1984: 256). Umberto Eco substituted the notion of ‘code’ with that of ‘encyclopedia’. Cesare Segre (1983: 144) observed that by concentrating solely on the level of codification and of the institution of rules of use, we lose sight of the processes of signification ‘which cannot be studied by taking the Saussurean model of sign as the starting point; [signification], on the contrary, should be placed at the centre of the processes of sign production and considered among the more complex results of unlimited semiosis’.

Above-mentioned Article 16, ‘Codes’ (*SS*, 1: 404-414), shows the difficulties involved in the use of the notion of ‘code’, though it is an object ‘of

specifically semiotic interest' (408). A pivotal question which ensues from confrontation of 'semiotics of code' with 'semiotics of interpretation' concerns the dyadic or triadic nature of the code, or more precisely of translation from significata to signifiers in encoding and vice versa in decoding.

With most writers of the past this process was regarded as dyadic; there were only the significatum and the signifier to be considered (e. g. Saussure 1964 [1916]). In contrast, Peirce and his followers regard this as (at last) a triadic process one in which (roughly speaking) the signifier both conveys (is directly decodable as) the significatum and — this is Peirce's critical contribution — in addition prompts (is indirectly decodable as) a response in which the directly-coded relation between signifier and significatum is reformulated or even amplified (this response is the 'interpretant'). ... (408)

[S]ince in Peirce's arguments every interpretant is a significatum in its turn, thus becoming involved at every turn in a new substitution equation (and algorithm), any blueprint or other signifier overlies an infinitely-nested set of codes and algorithms, each identical to its predecessor except for the new substitution equations and rules (if any) needed to code its interpretant (This exposition springs from various remarks by Peirce but mainly from *CP* 2.228). (409)

In *Encyclopedia of Semiotics*, the entry 'Code' (by Paul J. Thibault), too, shows the ambivalence of the notion of code in semiotics. This notion can be used to denote (1) a set of shared rules of interpretation and (2) a 'meaning-making' potential (see *ES*: 125).

The first view coincides with a model of communication as transmission of information encoded by the sender and decoded by the receiver on the basis of a

common code which is neutral, immune to interpretation, and sufficient for communication to come off successfully (postal package model). This model, says the entry 'Code', derives from Saussure's dichotomy between code (*langue*) and individual use (*parole*). It also derives from the first generation of research in information theory (Shannon and Weaver 1949) and cybernetics (Wiener 1948, Ashby 1956) and was influential in the development of semiotics in the 1960s and 1970s. Eco (1976) referred to this conception of communication when he distinguished mechanistic communication systems from systems of signification.

The second model of code in semiotics maintains that code and medium have 'a significant meaning-making potential' (*ES*: 126). This implies that

Code, in this view, is a semiotic resource — a meaning potential — that enables certain kinds of meanings to be made (in language, in the ways we dress, in our eating rituals, in the visual media, and so on) while others are not, or at least in that code. This view differs from the previous one in two important ways: First the internal-design features of the code — its grammar — have a significant potential for constructing meanings. ... Second, there is no dichotomy between code and behavior or use. (126)

According to the author of the entry 'Code', the representative personages of the second view of code in semiotics are Bronislaw Malinowski (1923), Gregory Bateson (1951), with his model of codification as a multilevel and hierarchical system of contextualizing relations, and Michael Halliday (1984). The entry does not mention Peirce, nor does the bibliography.

And yet in Eco's book of 1976 the transition from semiotics of communication to semiotics of interpretation is inseparable from the advent of

Peirce in Italy: indeed it is an expression of the confluence between Saussurean ‘semiology’ and Peircean ‘semiotics’ (see Sebeok ‘Foreword’ to Capozzi ed. 1997: xiii). Eco’s concern with Peirce’s semiotics can be traced in his studies on the triadic relation between sign (representamen), interpretant and object, the production of sign, the mechanism of abduction, interpretation of the text and its relation with the reader, reformulation of the notion of code and of dictionary semantics in terms of encyclopedia and of Peirce’s notion of ‘infinite semiotic process’. Eco revisits the question of openness (cf. *Opera aperta*, 1962) in *The limits of Interpretation* (1990) and in *Interpretation and Overinterpretation* (1992), in terms, as he says, of ‘unlimited semiosis’. In his recent book, *Kant e l’ornitorinco* (1997), Eco turns his attention to the question of the Peircean notions of ‘Dynamical Object’ and ‘Ground’. But gradual distancing from Saussurean semiology, ontological structuralism (cf. Eco 1968), the idea of a binary relation between signifier and signified and between code and message led Eco to assert the following as early as 1976 (in his paper on Peirce’s notion of interpretant delivered at the ‘Peirce Symposium on Semiotics and the Arts’ at The Johns Hopkins University in Baltimore): ‘I want to make explicitly clear that [his] present approach has to be labeled *Peircist*’ (quoted from Sebeok, ‘Foreword’, in Capozzi ed. 1997: xiii).

Eco’s research can be cited to show the fortune the notion of code in the development of semiotics from the 1970s, as well as to evidence Peirce’s influence in transformation. Most useful on this subject are Article 121, ‘The position of Eco’ (by Giampaolo Proni) in *Semiotik/Semiotics* (2, Chapter XII, ‘Current trends in semiotics’: 2311-2320; concerning our subject, see especially § 4, ‘A theory of codes’, and § 6.2, ‘Code change and code-switching’) and the entry ‘Eco, Umberto’ (by Gary Genosnosko, *ES*: 209-211).

According to Eco (1976), a code governs information transition from a source to a destination, but a code alone does not guarantee signification, since a connection cannot be established between (a), a set of signals ruled by internal restrictions of combination, and (c), a set of possible behavioral responses by the destination, without (b) any notion from a set of notions about the state of the world which can become communicative contents. Systems (a), (b), and (c) are called ‘s-codes’. An S-code is ‘a system (i) in which every value is established by positions and differences and (ii) which appears only when different phenomena are mutually compared with reference to the same system of relations” (Eco 1976: 38). As says Proni in his article in *Semiotik/Semiotics*, Eco synthesizes ‘the Hjelmslevian and structuralist approach with Peirce’s theory of interpretation’ (*S/S*, 2: 2314). In the words of the entry ‘Eco’ in *Encyclopedia of Semiotics*:

In keeping with his trademark hybrid blend of Hjelmslevian and Peircean categories, Eco reduces the two continua of the expression and content planes of Hjelmslev to one continuum; the matter through which semiosis takes place. Semiotic interpretation involves the application of Peircean concepts to define the segmented portions of the continuum serving as sign vehicles for content segments. (*ES*: 222)

As Proni says (*S/S*, 2: 2314-2315):

Eco takes the theory of interpretant from Peirce, but to accept the theory of the interpretant means to accept the process of unlimited semiosis, which is the main characteristic of the Peircean concept of sign (cf. Art. 100 § 2.3) ... It is not easy to deal with this infinity, but according to Eco ‘unlimited semiosis, ...

paradoxical as it may be, is the only guarantee for the foundation of a semiotic system capable of checking itself entirely by its own means'. (Eco 1976: 68)

Furthermore, on distinguishing between 'dictionary' and 'encyclopedia' and to explain the image of the 'labyrinth' which informs the semantic encyclopedia, Eco uses the 'rhizome' model elaborated by Deleuze and Guattari in 1999 (see Eco 1984: 80ff). This model indicates that any semiosis participates in an infinite network of interpretants.

The Peircean sign model is today gaining wide consensus in both semiotics and the philosophy of language (see § 3, 'The influence of Peirce's semiotics', 2032-2035, in Article 100, 'Peirce and his followers', by Helmut Pape, *S/S*, 2: 2016-2035). This particular sign model is now gradually supplanting the model of semiosis understood mechanistically as codification and decodification, which thanks to the diffusion of Saussurean structuralism has spread its influence from linguistics (and semiology) to other human sciences as well (see § 4, 'Saussure and Peirce', 2068-2069, in article 101, 'Saussure und seine Nachfolger' ['Saussure and his followers'], by Svend Erik Larsen, *S/S*, 2: 2040-2073). All the same, the mechanistic model continues to be applied in semiotic and linguistic studies:

Nevertheless, the mechanistic model retains a powerful hold on theories of human communication. ... For Noam Chomsky, a generative grammar is a system of rules for relating signals to their semantic representations. Chomsky claimed that this pairing of signal and semantic representation corresponds to the idealized competence of the speaker-hearer. This competence specifies the underlying mental mechanism that makes this pairing process possible. This model continues to exert influence. ('Code', *ES*: 126)

Similarly to the Saussurean model, the Chomskyian model too is dichotomous (competence/performance, surface/deep structure, innate rules/experience)

We know that the Saussurean sign model is grounded in a series of dichotomous pairs comprising the notions of *langue* and *parole*, *signifiant* and *signifié*, diachrony and synchrony, and the syntagmatic and paradigmatic axes of language (see § 2.1, ‘Gegenstandskonstruktion und Dichotomie’ in above-mentioned Article 101). This dichotomous view favored the connection between the Saussurean model and the mathematical theory of communication, and therefore reformulation of this model in such terms as *code* and *message*, *transmitter* and *receiver*. This explains why semiotics of Saussurean derivation has been described as ‘decodification semiotics’ (Rossi-Landi 1992b [1968]), or ‘code and message semiotics’ (cf. Bonfantini 1981). Despite their reductive character in relation to signifying and interpreting processes, for quite some time it was thought that such concepts as these could adequately describe all kinds of sign processes. They were employed to describe not only simple sign processes of the *signal* type relative to information transmission, but also the complex type, the *sign* in the strict sense relative to human communication in its globality and in its different aspects (for the distinction between ‘sign’ and ‘signal’, cf. Voloshinov 1973 [1929]; Ponzio 1985, 1997b and 2001).

In the framework of ‘decodification semiotics’ the sign is divided into two parts: the signifier and the signified (respectively, the sign vehicle and its content). These are related on the basis of the principle of *equal exchange* and of *equivalence* — that is, of perfect correspondence between communicative intention (which leads to codification) and interpretation (intended as mere decodification).

Furthermore, as amply demonstrated by Rossi-Landi (1992b [1968], 1975a) and subsequently by Ponzio (1990a, 1992b), the Saussurean sign model (the main reference point for decodification semiotics) is heavily influenced by the marginalistic theory of economic value as developed by the School of Lausanne (Walras and Pareto). Consequently, this sign model is largely the result of applying the *point de vue statique* of pure economics to the study of language. Article 101 (*S/S*, 2, XII) on Saussure highlights this aspect, referring to Rossi-Landi (p. 2067) and quoting from his book *Linguistics and Economics* (1975a). Assimilation of the study of language to the study of the marketplace in an ideal state of equilibrium gives rise to a static conception of sign. In fact, the latter is viewed in a synchronic framework and is described as being dominated by the paradigms of the logic of perfect correspondence between that which is given and that which is received. This is the logic of equal or greedy exchange regulating all social relations in today's dominant economic system.

Interpretation semiotics evidences the inadequacy of the sign model subtending decodification semiotics. No doubt, 'rediscovery' of interpretation semiotics has been favored by new orientations of a socio-cultural order arising from signifying practices that are intolerant of polarization between code and message, *langue* and *parole*, language system and individual speech. The flourishing of such signifying practices goes hand in hand with the weakening of the centripetal forces in linguistic life and socio-cultural life generally, which privilege the unitary system of the code over the effective polylogism, plurilingualism, multiaccentuativity and pluri-availability of signs. Moreover, by comparison with the claim to totalization implied by the dichotomies characterizing decodification semiotics, the categories of interpretation semiotics also account for the 'irreducibly other', as theorized by Bakhtin as well as by such philosophers as Emmanuel Lévinas (cf. Ponzio 1994, 1995a, 1996a).

As Voloshinov (1973 [1929]) had already demonstrated, the instruments provided by decodification semiotics are inadequate for a convincing analysis of the distinguishing features of human communication such as plurilingualism (especially that internal to a single so-called ‘national language’), plurivocality, ambiguity, polysemy, dialogism, otherness. Described in such terms verbal communication cannot be englobed within the two poles of *langue* and *parole*.

Far from being reduced to the status of mere signality, the sign is characterized in a strong sense with respect to signals by the fact that its interpretive potential is not exhausted by a single meaning. In other words, signifier and signified do not relate to each other on a one-to-one basis. As mentioned above, meaning is not simply a message formulated intentionally by the sender according to a precise communicative will. Nor the work of the interpretant sign is limited to the very basic operations of identification, mechanical substitution, or mere recognition of the interpreted sign. By contrast with signals, signs at high levels of semioticity cannot be interpreted by simply referring to a fixed and pre-established code, through mere decoding processes.

Signals are signs with the least semiotic consistency, that is, at the lowest level of semioticity. Signals presuppose a code, a system of rules with respect to which the relation between interpreted and interpretant is *predetermined*. But more than just a sector of signs (see Ponzio 1990a, 1997b, Ponzio, Calefato, and Petrilli 1999), the signal is a constitutive component of signs in general. From this point of view rather than use the term ‘signal’ which suggests something separate from sign, ‘signality’ seems more appropriate to indicate the lowest level of semioticity or signness. As much as the verbal sign is characterized by multi-voicedness, it too contains a margin of signality. In other words, under certain aspects verbal signs are signals as well, which is to say that from a certain point of view, signs too present a univocal relation between interpreted

and interpretant. With signality signs are at the lowest level of interpretation, the level of identification or recognition. In earlier writings we have proposed that the interpretant relative to the signal or signality be called ‘interpretant of identification’. In the case of verbal signs, for example, the interpretant of identification (a) permits recognition of phonemic or graphic contour; (b) identifies semantic content (‘immediate interpretant’ in Peirce’s terminology; ‘meaning’ vs ‘theme’ in Bakhtin-Voloshinov’s terminology); and lastly, (c) identifies morphological and syntactic conformation.

The relation of the interpretant of identification to the interpreted is univocal and predetermined by a code, analogously to the relation between interpretant and interpreted in signals. But the signal component of the verbal sign does not characterize it as a sign. For this reason, a description of the verbal sign limited to such aspects does not account for its specificity as a sign. In other words, like all other signs except for signals, the verbal sign too is made of signality, but is not characterized by the latter.

We have proposed that the interpretant specific to the sign, that which interprets its actual sense be called ‘interpretant of answering comprehension’. Such an interpretant does not limit itself to identifying the interpreted but installs a relation of involvement with it, of participation: it responds to the interpreted and takes a stand towards it. Instead, the aspect of the utterance privileged by Saussurean and Chomskyan ‘mechanistic models’ of the sign (see entry ‘Code’, *ES*: 123) is connected with the interpretant of identification, consequently reducing the verbal sign to the status of signal.

The limit of the sign model which maintains that interpretation is mere decodification is not only that ‘this model refers to the communication of messages in a purely mechanistic (nonhuman) system’, as says the author of the entry ‘Code’ (*ES*:125). Sign models are also intimately related to our conception

of the subject: in the perspective of semiotics of decodification or equal exchange, the subject is grounded in the concept of identity with a very low margin of otherness or dialogism. According to this approach, the subject coincides perfectly with his or her own consciousness to the extent that s/he fully manages his or her own sign processes, subjecting what s/he communicates to his or her own will as a sender and encoder.

On the contrary, those trends in semiotics that refer to the Peircean model of sign and generally assemble under the tag ‘semiotics of interpretation’ (as distinct from ‘semiotics of decodification’), describe the production of sense and meaning in terms of an ongoing, open effort without the guarantees offered by appeal to a code regulating exchange relations between signifiers and signifieds (cf. Peirce, *CP* 5.284; Eco 1984 and 1990; Petrilli 1995 and 1996, Ponzio, 1988, 1993a, 1993b). In a paper of 1984 (now in Ponzio 1990a) entitled “Semiotics between Peirce and Bakhtin”, Ponzio uses categories developed by these two thinkers to demonstrate how the sign model proposed by semiotics of decodification or equal exchange is reductive and naïve. In fact, in this framework

the sign: (1) is at the service of a meaning pre-established outside the communication and interpretation process, (2) is a flexible and passive instrument in the hands of a subject who is also given, pre-established, and capable of controlling and dominating the sign, and furthermore, (3) is decodifiable on the basis of a pre-existent code common to both partners in the communicative process. (Ponzio 1990a: 252)

The sign model proposed by interpretation semiotics is constructed on the basis of such categories as Peirce’s tripartite division of interpretants into

‘immediate interpretant’, ‘dynamical interpretant’, and ‘final interpretant’, his subdivision of the object into ‘immediate object’ and ‘dynamical object’, and his main triadic division of signs into ‘symbol’, ‘index’, and ‘icon’, etc. (see § 2, ‘Semiotic and theoretical structure of Peirce’s philosophy’, in above mentioned Article 100 on Peirce *S/S*, 2: 2019- 2032). Peirce places the sign in the dynamic context of semiosis (developing the concept of ‘infinite semiosis’), and its relation that is dialectic and dialogic to the interpretant. Considering such aspects, to associate Peirce with Bakhtin would seem relevant. Indeed, Bakhtin too places the sign in the context of dialogism where alone it may flourish as a sign, using in his studies such categories as ‘text’, ‘otherness’, and ‘responsive understanding’. Though working independently of each other and in different directions (Peirce was primarily concerned with questions of a cognitive order, Bakhtin with literary language), both scholars recognize the fundamental importance of dialogism.

Semiosis, information and code

The entry ‘Semiotic terminology’, by Paul Bouissac (*ES*: 568-571), reads as follows:

Communication theories have also generated a large number of neologisms that have found their way in the current semiotic terminology, such as binarism, cybernetic, entropy, and information, as well common words such as message, noise, and code that are used in this context with the specialized meanings that they are given in the landmark books by Norbert Wiener (1948), Claude

Shannon and Warren Weaver (1949) and Ross Ashby (1952). Why such a profusion of neologism? (570)

In truth, the provenance of terms used in semiotics is not a problem.

Morris (1946) constructs his semiotic terminology in relation to biology. He turns to the language of biology for his reserve of terms to construct a terminological apparatus to talk about signs. In other words, he treats biological language as a terminological reservoir to build his semiotical vocabulary. He uses biological terms as *definientes* to establish the criteria for identifying signs (making a point of talking about ‘criteria’ and not ‘definitions’ when a question of analyzing signs). His recourse to biology for semiotic terminology does not imply ‘biologism’ in a negative sense. In other words, there is no inclination in his work to *reductionism* (the temptation of reducing a plurality of universes of discourse to one only, for the case in point the discourse of biology), to a metaphysical fancy of some sort, or a naturalistic vision of the existent that loses sight of the historico-social dimension of semiosis. From this point of view, Morris’s attitude was completely different to the logical empiricists or neopositivists who developed an explicitly physicalist orientation in reductionist terms, or from the reductionism of Carnap’s ‘logical syntax’ (cf. Article 113, ‘Morris, seine Vorgänger und Nachfolger’ [Morris, his predecessors and followers] by Dieter Münch and Roland Posner, *S/S*, 2: 2204-2232).

The same thing happens in the semiotic use of terminology from theories of communication and binary opposition (see entry ‘Opposition’, by Göran Sonesson, *ES*: 459-461).

As already stated, Article 18 ‘The evolution of semiosis’ by Sebeok (in *S/S*, 1) starts with the Peircean definition of semiosis as an irreducibly triadic teleonomic process, comprising a relation between a sign, its object and its

actual or potential interpretant (cf. 436). On the basis of this triadic model of semiosis, Sebeok returns to such notions as ‘information’, ‘code’, ‘message’ ‘double articulation’, which express a dichotomous view of semiotics. However, he uses these terms to explain the evolution of semiosis on Earth. Through them he shows the crucial differences between nonsemiotic or quasisemiotic or protosemiotic phenomena in nonbiological atomic interactions and in inorganic molecules, on the one hand, and semiosis as a criterial attribute of life, on the other. He also uses them to characterize the different species of living beings.

With reference to the evolutionary process of semiosis, ‘information’ and ‘semiosis’ are used by Sebeok to indicate two different evolutionary phases. Semiosis is what distinguishes the animate from the inanimate. Before semiosis there was information. The essence of information is change; the prerequisite of semiosis is life. Information in semiosis is possible. On the contrary, semiosis in information is impossible. Semiosis and life include information, imply it. Information (as a measure of the nonuniform, orderly properties of physical systems) evolved out of an initial state of maximum entropy (as a measure of disorder) and semiosis evolved out of information (cf. 435-436; see also Sebeok 1986a: 15-16).

The mutually implicate technical terms ‘information’ and ‘entropy’, which arguably belong to the margins of semiotics, were eventually applied to living systems. The biophysicist Lila L. Gatlin (1972) applied Shannon’s theorems on the notion of information viewed as a measure of the number of alternative messages (Shannon 1948) to a theory of living systems. She showed that Shannon’s equations may be used in the study of information transmitted from DNA to protein along channels of biochemical processes in the cell (cf. *S/S*, 1: 437).

In the entry ‘Information’ (by Ulrich J. Krull) included in *Encyclopedia of Semiotics* we find the following comments on the study of the genetic code in terms of information:

The mathematical concept of information implies the generation of a sequence, as when information is encoded by a sequence of binary digits. ... However, ‘transferring information in bimolecular recognition’ is usually implied as communication between the molecular partners, through which the receptor sees the ligand and recognizes that it is right for binding. Mathematically, it is erroneous to speak of information in this case because no sequenced message is either generated or duplicated, and it becomes apparent that the word *information* applied to molecular recognition is simply a substitute for the physicochemical forces that govern binding. (*ES*: 312. See in the same handbook the entries ‘Chemical communication’, by the same author, and ‘Receptors’, by Jesper Hoffmeyer)

On the other hand, what we find interesting in the transition of the concept of information from a physical (kinetic) system to a semiotic (kinematic) system is the following. This mathematical concept, which later came to be generalized by Léon Brillouin (1956) — who defined information as negative entropy or negentropy — and then applied to living organisms, ends up paradoxically by being eschewed as suspected of ‘intentionality’. According to Yates and Kugler (1984) both in ‘information’ and in ‘communication’ lies embedded the elusive property of ‘intentionality’ (see *S/S*, 1: 437).

In Sebeok’s article on the evolution of semiosis, the specific terms of so-called ‘semiotics of codification’ (see above) such as ‘message’ and ‘code’ are reintroduced in the new context of global semiotics, or semiotics of life. From an

epistemological viewpoint the latter is founded on interpretation semiotics (in line with Locke, Peirce, Morris). Similarly, Th. von Uexküll in his explication of the functional cycle employs the terms ‘code’ and ‘context’ connecting them with the Peircean triad: representamen, interpretant, object of reference (cf. Article 110, § 3.3, ‘Kontext und Kode’, *S/S*, 2: 2187-2188).

Sebeok mentions Chapter 2 entitled ‘Messages, messages’ in A. G. Cairns-Smith’s book *Seven Clues to the Origin of Life* (1985). In this book the term ‘message’ is used to state that semiosis is at the heart of life, since ‘messages’ provide ‘the only connection between life now and life a million or a billion years ago’ (Cairns-Smith 1985: 28). Messages in this sense are the most important inheritance in living systems, since these are autopoietic systems, i.e. they self-maintain their organization and function through a ceaseless exchange of matter, energy, and messages which can persist over the vast reaches of time. As biological inheritance, messages are the interaction through which, in Maturana’s words (1980: 53), living beings recursively ‘generate the network of productions that produced them’.

‘Code’ is a term which is employed to characterize human as well as nonhuman and endosemiotic sign systems, i.e., verbal language (*langue*) and the genotypical system, i.e., the ‘genetic code’. It is curious that first, owing to the dominance of linguistics, the terms ‘code’ and ‘language’ were applied indifferently to verbal and nonverbal sign systems, including the genotypical system, and that later ‘much fruitless’ (*S/S*, 1: 437) debate ensued on whether the genetic code is (like) a language or not. To say that in both cases we are dealing with ‘languages’ and ‘informational systems’ means to say nothing about them as specific devices. As Sebeok notes (437), the question of analogy between the two codes, the genetic, endosemiotic, molecular, on the one hand, and the linguistic, anthroposemiotic, including a verbal component, on the other, seems

now a secondary one. ‘What matters is that both are productive semiotic systems’ (437).

Sebeok distinguishes between *language* and *speech*. (cf. 443; see also Sebeok 1986a: 10-44; 1991a: 49-58 and 68-82; Sebeok 1994b: 105-127). Language is the specific primary modeling device of the species *Homo*. Unlike speech, the specific function of language is not to transmit messages or give information. On Sebeok’s account, language appeared and evolved as an *adaptation* much earlier than speech in the evolution of the human species to *Homo sapiens*. Speech like language made its appearance as an adaptation, but *for the sake of communication* and much later than language, precisely with *Homo sapiens*. Speech evolved out of language. Language exists without speech while, on the contrary, speech without language is impossible. Every species is endowed with a model that produces its own world, and language is the model belonging to human beings. However, as a modeling device human language is completely different from the modeling devices of other life forms. Its characteristic trait is what the linguists call *syntax*. Thanks to syntax human language is like Lego building blocks, it can reassemble a limited number of construction pieces in an infinite number of different ways. As a modeling device language can produce an indefinite number of models; in other words, the same pieces can be taken apart and put together to construct an infinite number of different models. The ‘double articulation’ (see in particular Martinet 1960, 1962, 1985) of verbal speech is grounded in the characteristic trait of language, i. e., syntax.

From this point of view a new similarity can be identified between genetic code and language. The question is not the inappropriate one of whether the genetic code is a language or not, considering the above-mentioned specific meaning we have given to the term ‘language’ (according to which the

expression ‘The language of life’ in the title of George W. and Muriel Beadle’s book of 1966 is incorrect). The real question is whether the language device (verbal language included) and the genetic code device are homologous. It would seem so. ‘This is made possible’, says Sebeok (437-438) ‘by the principle of double articulation’, which, in linguistic contexts, refers (roughly) to the dichotomy between merely distinctive, or phonemic, units and significative, or grammatical, units (such as morphemes or words). Sebeok formulates this homology in another text (Sebeok 1986a) as follows:

The genetic code may have been the earliest innovation of a double-articulation ‘language’ As in human verbal language, a finite number of primitive signs (with earlier significance on another level), lose that significance or are revalued when operating as raw materials for a new sign system. This amounts to reshaping an analogue system from a digital one. (41)

The verbal code, as many have realized, is like the genetic code in cardinal respects, even (contrary to what Crick dubbed the ‘central Dogma’) in the sense that genetic programs can run, as in retroviruses, backwards. Earlier systems of this sort include, on the physical level, the eight basic properties of the universe, and, on a chemical level, the principle known as Mendeleev’s law. (16. Cf. also Article 20, ‘Microsemiosis’, by Eugene Yates, 457-463 § 1.6, *S/S*, 1: 459)

The fact that language incorporates a syntactic component (articulation), says Sebeok, is all-but-singular: this feature is not present in other zoosemiotic systems, but does abound in endosemiotic systems, such as the genetic code, the immune code, the metabolic code, and the neural code (see Sebeok 1991a: 57-58).

In this way semiosis and information, the genetic code (as well as other endosemiotic systems) and verbal language, semiosic systems and semiotic systems are connected in a structural and genetic framework, though each is characterized by its own specific quality. In the informational-semiosic-semiotic and lifeless-living continuum, similarities and differences are similarities and differences in quality and structure. In this sense, in the case of similarity, it is not about *analogy* but about *homology*, like the terminology of genetic biology (on the use in semiotics of these two notions see Rossi-Landi 1992b [1968] and 1994 [1972]). Says Sebeok:

Duality (of double articulation) can of course be expressed in radically different substances: say, polymeric molecules (the four nucleotides, which can generate the proteins that manufacture everything else alive) in the one; and sound waves in the other. (Double articulation, however, by no means presupposes animation of matter; on the contrary, its fundamental realization is embodied in Mendeleev's periodic table of elements with related electronic configurations). (S/S, 1: 438)

Binarism and ecumenicalism

Consequently, in reference to both semiosis and information we may use the dichotomies codes/messages, information/redundance, first/second articulation, etc. What matters is that all these notions are functional to explicating the different aspects of information and of the semiosic and semiotic universe on the basis of a sign conception grounded in Peircean contributions to semiotics. For example, the concept of redundance is available both in linguistic studies of the

utterance or in text semiotics and in biosemiotic studies of the genetic code. Concerning the latter, Sebeok (1986a: 33) notes:

Incidentally, geneticists have found that the relation between the (four-letter) nucleic acid code and the (twenty-letter) protein code — the genetic code — is replete with redundancy, since several groups of their nucleotides, or triples, along the nuclei acid chain define the same amino acids along the protein chain (that is, these groups are synonymous).

In Article (18) presently under examination, Sebeok, in keeping with his idea of ‘Ecumenicalism in semiotics’ (the title of Chapter 4 in his book of 1979: 61-83), explains some basic concepts in endosemiosis (he coined the substantive ‘endosemiotics’ in 1976: 3, see also Sebeok 1991c, Ch. 1, Part. iii), in terms of binarism. Endosemiosis invests one of the fields of global semiotics which, in accordance with Peirce, recognizes semiosis as a pervasive fact of nature as well as of culture. In the two seemingly antithetical tendencies of semiotics, binarism, i.e., the characteristic feature of systems grounded in oppositional pairs, has its basis in the glottocentric trend of which a representative view is Saussurean semiology. The scope of global semiotics, which encompasses the entirety of our planetary biosphere, does not exclude binarism. Its ecumenical view admits binarism but neither as the sole characteristic feature of a semiosis conceived in accordance with a verbal linguistic model, nor as limited to the human cultural world. As we see in the well-documented entry “Binarism” (by Paul J. Thibault) in *Encyclopedia of Semiotics* (76-82), these limits are involved in the traditional concept of binary oppositions. All mentioned exponents of the theory of binary oppositions are scholars in the fields of verbal or cultural phenomena (Saussure, Trubetzkoy, Chomsky, Halle, Jakobson, Lévi-Strauss).

Instead, in Sebeok's opinion, who extends the notion of binarism to the sphere of endosemiosis, the primal universal sign opposition in the ontogeny of an organism is that between self (ego) and other (alter) (cf. *S/S*, 1: 438). This is a consequence of Jakob von Uexküll's doctrine of signs, according to which nothing exists for any organism outside its bubble-like private *Umwelt*, in which, although impalpably to any outside observer, it remains, as it were, inextricably sealed. The elementary binary opposition subsequently brings to pass the second semiotic binary opposition, that of *inside* versus *outside*. It is this secondary opposition that enables an organism to 'behave', that is, to enter into relations and link up with other living systems in its surrounding ecosystem. The behavior of an organism is definable as the commerce by means of signs among different *Umwelten*. The binary opposition self/other is the basis of the immune system, and the subject of new disciplines such as semioimmunology and immunosemiotics. Also, the immune system concerns communication of the organism with itself. Receptors and specific secreted products, or antibodies, of the immune system not only recognize the exosemiotic world of antigenic determinants (epitopes), but they also recognize antigenic determinants on the immune receptors themselves (endosemiotic idiotopes) (cf. 438-439 and Article 21, 'Endosemiose' [Endosemiosis] (by Th. von Uexküll, Werner Feigges, and J. M. Hermann), 464-487. On the semiotics of self, see also Sebeok 2001b: 120-134 and Sebeok, Petrilli, and Ponzio 2001).

As we can see, such concepts as binarism, code, and message can be applied to the whole of semiosis throughout nature and culture. Sebeok's article on the evolution of semiosis also implicitly evidences the evolution of semiotics from semiology to global semiotics, and the ecumenical attitude of the latter to any type of sign system or code: from verbal language and cultural sign systems, to the immune system, metabolic code, neural code, brain code, etc. (cf. *S/S*, 1:

438-440, and Article 21, ‘Endosemiose’ [Endosemiosis]; see also ‘Neurosemiotics’, by Paul Bouissac, *ES*: 446- 448). However, as remarks Sebeok (1979: 64):

Ecumenicalism in semiotics means far more than a plea for attempting to capture global properties of sign systems in general and for unifying local variations that are criterial for heretofore unrelated information about the genetic, metabolic, neural, intraspecific vs interspecific, nonverbal vs verbal and nonvocal vs vocal codes beside a host of secondary modeling systems. ... [Ecumenicalism] calls attention to the holistic force of semiotics This perspective was perhaps best articulated by Charles Morris, who, working initially in the overall frame of the *International Encyclopedia of Unified Science* ... conceived of semiotics as an instrument of all the sciences.

As we have said above, this aim is also shared by the editors of *Semiotik/Semiotics*.

Method and criticism

In our opinion (see Ponzio 1993a; Ponzio and Petrilli 1998; Ponzio, Calefato, and Petrilli 1999; and Petrilli 2001), the target of semiotics is not only of a cognitive and epistemological nature. Semiotics is meta-semiosis also in the sense of a critical attitude kept up-to-date with the sense of criticism not only after Kantian critique, but also after Marxian *Kritik*.

Since method means etymologically *meta-hodòs*, ‘beyond-way’, to ask about the *methods of semiotics* (this is the title of Chapter IV ‘Methods of

Semiotics’, 592-667; cf. introductory Article 28, ‘Methodenprobleme der Semiotik [Methods of Semiotics]’, by Wolfgang Balzer, 592-603) means also to question the critical function of semiotics, its capacity for criticism with respect to today’s reality, today’s natural and human world, today’s choices made by humans in behavior and ways of life.

According to Jerzy Pelc who has authored Articles 30 (‘Theory formation in semiotic’) and 31 (‘Understanding, explanation, and action as problems of semiotics’) in above-mentioned Chapter IV, typical features of a semiotic theory are the following:

- to give an interpretation of terms used in semiotic analysis;
- to answer to questions such as ‘What is a sign?’, ‘What does semiosis consist in?’;
- to be dynamic in character, e. g., Peirce’s theory of semiosis, Morris’ theory of signs, or Wittgenstein’s so called ‘second’ philosophy of language;
- the character of hypothetical description and to be subjected to falsification;
- the task of explaining the nature of the relationship between the sign and that of which it is a sign, etc. (cf. 640-642).

To the typical features of semiotics we may add another, the responsibility of criticism in the sense explained above. This task seems to ensue from the reflections expressed by Pelc in Article (31). Since, with Pelc, we consider ‘understanding, explanation, and action as problems of semiotics’ (which, as seen above, corresponds to the title of this article; cf. 644-667), semiotics thus described also concerns the propensity for criticism as it derives from awareness of the human being’s radical responsibility as a ‘*semiotic animal*’.

Properly understood, the '*semiotic animal*' is a responsible actor capable of *signs of signs*, of mediation, reflection, awareness regarding semiosis and, therefore, life over the whole planet.

Besides, as we learn from Sebeok's modeling systems theory (cf. Sebeok 1991a, 1994b, Sebeok and Danesi 2000), thanks to the species-specific modeling device of language humans unlike other species, can produce an infinite number of (in Leibniz words) 'possible worlds'. This means that we are capable of questioning our world and possibly changing it. Our modeling device brings us back to the 'play of musement' (see Sebeok 1981). This is a human capacity which is particularly important not only for scientific research, all forms of investigation, and artistic creation, but also for a critical attitude with respect to 'our reality', the 'positive facts', the 'world as it is given'.

If understanding, explanation, and action are problems of semiotics, the problem is also to deal with them in such a way as to meet the early commitment of semiotics (as semeiotics, the branch of medical science relating to the interpretation of symptoms) to the 'health of life' through the study of signs. In order to cultivate its capacity to understand the entire semiotic universe, semiotics must continuously refine its critical functions, its capacity for listening and criticism.

In this sense global and ecumenical semiotics must be adequately grounded in cognitive semiotics, but also be open to a third dimension beyond the quantitative (its global character) and the epistemological (its holistic capacity), that is, the critical and ethical.

Binarism, triadism and dialogism

Concerning binarism in semiotics, the scope of semiotic enquiry as it appears in *Semiotik/Semiotics* as well as in Sebeok's global semiotics undoubtedly transcends the opposition between semioticians with a Saussurean/Hjelmslevian/Greimasian orientation (see above-mentioned Article 101 and Articles 117, 'Hjelmslev and Glossematics', by Jeorgen D. Johansen, and 19 'Greimas and his School, by Hermann Parret, *S/S*, 2: 2272-2289, 2300-2311) and semioticians of Peircean observance (cf. Article 100 and the above-mentioned entry 'Semiotic terminology', *ES*: 570). These two factions would seem to oppose *binarism* to *triadism*. However, the volumes forming *Semiotik/Semiotics* would seem to confirm our opinion that the heart of the matter does not at all lie in the opposition between binarism and triadism. Instead, of focal importance we believe is the opposition between a model of sign that tends to oversimplify things with respect to the complex process of semiosis and a semiotic model (as prospected by Peirce) that would seem to do more justice to the various aspects and factors of the process by which something is a sign. This is not merely achieved on the basis of an empty triadic form, but rather thanks to the specific contents of Peirce's triadism, in other words, thanks to the categories his triadism in fact consists of, the typology of sign it proposes, the dynamic model it offers by describing signs as grounded in *renvoi* from one interpretant to another. The categories of 'firstness', 'secondness', and 'thirdness', the triad 'representamen', interpretant', and 'object', characterization of the sign on the basis of its triple tendency towards symbolicity, indexicality, and iconicity, enable us to emphasize and maintain in a semiotic perspective the *alterity* and *dialogism* constitutive of signs. In previous books and papers we have attempted to highlight the dialogic and polylogic character of Peircean logic. The merit does not go to the triadic formula. Proof for this is offered by Hegelian dialectic in which triadism,

abstracted as it is from the constitutive dialogism of sign life, gives rise to metaphysical, abstract and monological dialectic. It is odd that in the entry 'Binarism' in *Encyclopedia of Semiotics*, the author should propose Hegelian philosophy as a means of overcoming the theory of binary opposition in Lévi-Strauss's structuralism (cf. *ES*: 81). Bakhtin, in his 1970-71 notebooks, gives a good explanation of how Hegelian monological dialectic is formed, showing how it actually has its roots in a vital dialogic sign context. The process consists in taking out the voices (division of voices) from dialogue, eliminating any (personal/emotional) intonations, and thus transforming live words into abstract concepts and judgements, so that dialectic is obtained in the form of a single abstract consciousness. Peirce himself also took a stand against the systemic skeleton of Hegelian analysis, against dialectic intended as a kind of hypochondriac search for an end, that is, as being oriented unilaterally instead of being open and contradictory (on the relation between dialogue and dialectic in Peirce and Bakhtin, see Ponzio and Bonfantini 1986 and Ponzio, Bonfantini, and Petrilli 1996).

The alternative in semiotics is not between binarism and triadism, but between *monologism* and *polylogism*. The limit of the sign model proposed by the semiology of Saussurean matrix is not determined by binarism, as is understood instead in the entry 'Binarism' included in *Encyclopedia of Semiotics* (for a careful exposition of binarism in Saussure, see § 222, 'Binarität', in the above-mentioned article). On the contrary, it is determined by the fact that such binarism finds expression in the concept of equal exchange between signifier and signified, and in the reduction of complex sign life to the dichotomous scheme of code and message (cf. Ponzio 1990a: 279-280).

The spheres of semiosis and their dialogic interconnection

Semiotics today has come a long way with respect to the science of signs as it had been conceived and foreseen by Saussure. In *Semiotik/Semiotics* and in *Encyclopedia of Semiotics* semiotics is far broader than a science that studies signs only within the sphere of socio-cultural life. Semiotics is not only *anthroposemiotics* but also *endosemiotics* (the study of cybernetic systems inside the organic body on the ontogenetic and phylogenetic levels), *microsemiotics* (the study of metabolism in unicellular forms), *mycosemiotics* (semiotics of fungi), *phytosemiotics* (which studies the semiosis of life), zoosemiotics (semiotics of interactions among animals), *machinsemiotics* (semiotics of sign processing machinery), *environmental semiotics* (the study of interaction between the various species and environment).

Articles 19-25 in *Semiotik/Semiotics* characterize the various types of sign processes in biosemiosis following the order of the evolution of semiosis originating with the development of life on Earth. As says Sebeok (*S/S*, 1: 437), exobiology and extraterrestrial semiotics are twin sciences that so far remain without a subject matter. However, an article (176, the last, by Richard Berendzen and Bernard M. Oliver) entitled ‘Extraterrestrial communication’, is foreseen in forthcoming vol. III of *Semiotik/Semiotics*.

After introductory Article 18 ‘The evolution of semiotics’ and Article 19, ‘Biosemiotics’, the articles that follow explore the various spheres of semiosis (micro- endo- myco- phyto- zoo- anthro- semiosis): 20, ‘Microsemiosis’; 21, ‘Endosemiose’ [‘Endosemiosis’] (by Th. von Ueküll, Werner Geigges, and Jörg M. Hermann), 464-487; 22, ‘Mykosemiose’ [‘Mycosemiosis’] (by Gunda Kraepelin), 488-507; 23, Phytosemiosis (by Martin Krampen), 507-522; 24, ‘Zoosemiose’ [‘Zoosemiosis’] (by Werner Schuler), 522-531; 25,

‘Antroposemiose’ [‘Anthroposemiosis’] (By Franz M. Wuketits), 532-548; 26. ‘Machine semiosis’ (by Peter B. Andersen, Per Hasle, Per A. Brandt), 548-571; 27, ‘Ökosemiose’ [Environmental semiosis] by Günther Tembrock, 571-592. In above-mentioned Article 110 on J. von Uexküll’s ‘Umweltlehre’, we find in § 5 a further explication of the relation between semiotics and biosemiotics.

In *Encyclopedia of Semiotics*, the entries that specifically deal with semiotics extended to the diffusion of signs throughout our entire planet are ‘Biosemiotics’ (by Jesper Hoffmeyer), 82-85; ‘Gaia Hypothesis’ (by Evan Thompson, 253-257, ‘Evolution’ (by Michael Ruse), 223-225, ‘Umwelt’ (J. Hoffmeyer), 623-624, ‘Zoosemiotics’ (by Michael Ruse), 652, as well as the above-mentioned entry ‘Sebeok’.

Hoffmeyer, in his entry ‘Biosemiotics’, emphasizes two important distinctions in biosemiotics: the first is the distinction between endosemiotics (which deals with sign processes inside organisms) and exosemiotics (which deals with sign processes between organisms). The second is the distinction

... between horizontal semiotics and vertical semiotics. Horizontal semiotics is concerned with sign processes unfolding in the spatial or ecological dimension and comprises most of endo- and exosemiotics. Vertical semiotics studies the temporal or genealogical aspects of biosemiotics — that is, heredity: the transmission of messages between generations through the interdependent processes of reproduction and ontogenesis. From a semiotic point of view, this transmission is based on an unending chain of translation of the hereditary messages back and forth between the digital code of DNA and the analog code of the organism. (83)

Bacterial semiosis seems unrestricted by the physical, chemical, or geographic boundaries of energy, matter, and signs. According to Sonea (1988, Sonea and Panisset 1991), all bacteria form a communications network spread out over the planet Earth. This network is similar to a global computerized communications network and possesses an enormous data base which functions in a manner reminiscent of human intelligence (cf. *S/S*, 1: 440). Bacteria interact with eukaryotes.

The key to semiosis in the microcosm is symbiosis, a quintessentially semiotic concept together with such subsumed concepts as parasitism, mutualism, commensalism, and the like. All organisms in the macrocosm, i.e. all visible organisms, evolved through symbiotic unions between different microbes, which subsequently co-evolved as thoroughly interwoven living ‘corporations’ coordinated by means of nonverbal (and, in the case of hominids, also verbal) signs. With regard to such evolution of semiosis, Sebeok notes:

Symbiotic alliances, in due course, became permanent, converting organisms (namely, prokaryotes, which share a kind of immortality, but at the expense of lacking individuality) into new, lasting collectives (namely, eukaryotes, which, on the contrary, pursue individuality, but at the expense of an existence between the two poles of sex and death) that are more than simply the sum of their symbiotic parts. (440).

Sebeok quotes Margulis and Sagan (1997: 127), who believe that ‘the concepts and signals of thought are based on chemical and physical abilities already latent in bacteria’, after stating which they then move on to ask:

Could the true language of the nervous system ... be spirochetal remnants, a combination of autocatalyzing RNA and tubulin proteins symbiotically integrated in the network of hormones, neurohormones, cells, and their wastes we call the human body? Is individual thought itself superorganismic, a collective phenomenon?'. (Margulis and Sagan 1997: 150-151)

Their additional hypothesis is that perhaps

groups of humans, sedentary and packed together in communities, cities, and webs of electromagnetic communication, are already beginning to form a network as far beyond thought as thought is from the concerted swimming of spirochetes. (153)

According to one standard scheme for the broad classification of organisms five kingdoms have now been distinguished: plants; animals; and fungi. Remaining life forms can be negatively defined as nonplants, nonanimals, and nonfungi. They are: protists (including microbes composed of nucleated cells); and Prokaryotes, the Monera, where bacteria belong (cf. *S/S*, 1: 440 and 488).

The criterion used to divide macroscopic entities into three complementary categories called Superkingdoms — plants, animals, and fungi — is the nutritional patterns of each class, in other words, the three different ways in which information (negentropy) is maintained by extracting order out of the environment.

In this case too semiotics uses the categories of communication and information theory to explain the transformation, in organisms, of signs into other signs in accordance with the identification of organisms with signs going back at least to Peirce (cf. 141; see also “Animal” in biological and semiotic

perspective', 1986, in Sebeok 1991a: 100-115, and the entry 'Animal', by Akira Lippit, *ES*: 27-30). Life couples two transmutative processes, one energetic, the other semiotic. *Plants* are the producers that derive (or organisms that build up) their food from inorganic sources through photosynthesis. *Animals*, or ingesters, are the transformers, that derive their food — preformed organic compounds — from other organisms. *Fungi* are decomposers (or organisms that break down), which, in opposition to animals, do not incorporate food into their bodies, but absorb the resulting small molecules from digestive enzymes secreted into the environment by themselves.

On this macroscopic scale, we have two polar-opposite life forms: the composer plants, and the decomposer fungi. With respect to this binary opposition animals can be seen as intermediate transforming agents midway between the other two. Through such mediation by animals, which became supreme experts at semiosis (among their many cells, among themselves, and with the being of other life forms), life (semiosis) evolved from binarism to triadism. Sebeok is right when he observes a remarkable parallelism between the taxonomers's triadic model and the triadic model of Peircean semiotics (cf. *S/S*, 1:441).

As Krampen shows in his article (23), plants have significant interactions with fungi as well as with animals. As to fungi interactions (cf. Article 22 and Article 19, § 4.2.2), they consists of communication with green plants (especially their roots), with algae (with which have been produced 20,000 species of lichens), and with insects.

Concerning 'zoosemiotics' (cf. Article 19, § 4.2.3, and Article 24), this term dates back to 1963 and is discussed in some detail in Sebeok 1972. Sebeok remarks (cf. *S/S*, 1: 442) that it denotes semiosis in animals *inclusive of the*

nonverbal semiotic component in man (see Sebeok, 'Nonverbal communication', in Sebeok 2001b: 105-114).

On this nonverbal component of semiosis is founded the anthroposemiotic component, which necessarily and additionally implies the species-specific modeling device called by Sebeok 'language'. On language is founded speech of the various verbal languages. Consequently, the search for verbal semiosis in four species of Great Apes, and perhaps in certain pelagic mammals as well (which received exaggerated media attention in the 1960s and 1970s) is a false trail (for critical reviews of the mythology of language-endowed animals, see Umiker-Sebeok and Sebeok 1981; and Sebeok 1981, Ch. 8.).

The difference between language-endowed human animals and languageless nonhuman animals does not seclude their reciprocal interconnection in a common, more generalized evolutionary process and in the continuum of semiosis-life. The view of global or holistic semiotics is at once a unifying and a specifying view. Besides intraspecific semioses, animal communication also includes interspecific semioses of which interactions between humans and animals are part.

Animal communication in particular, in such social animals as certain insects, dolphins, wolves and lions, and of course primates, may be viewed holistically as global semiotic systems. Also the human brain, in good conformity with neurophysiological facts, would seem to be a fundamentally social structure, its semiotic capacity, by analogy to parallel computers, arising from the interaction of many relatively simple sign processors (cf. 443).

The result of it all is that the interconnection between sign and life is also the interconnection among all signs forming life over the whole planet.

In *Semiotik/Semiotics* the gaze of semiotics moves from the protosemiosis of energy-information to the overall processes of the complexification of

semiosis in the evolution of life over the planet: from prokaryotes to monocellular living beings to the eukaryotic aggregates which form the multicellular organisms belonging to the Superkingdoms. The latter coexist and interact with the microcosm and together form the great semiobiosphere. All this results in an indissoluble interconnection presented by the *network of signs*: in Sebeok's words, this network extends from the Lilliputian world of molecular genetics and virology to the man-size world of Gulliver and finally to the world of Brobdingnag, the gigantic biogeochemical ecosystem called Gaia. At first sight this system may well seem to be made of numerous separate living species, but, at a closer look, we soon realize that each one of its parts, ourselves included, is interdependently connected with all others. This system taken wholly, so to say, is the only ecosystem which may really be considered as such (even though it too only relatively).

According to 'The Gaia hypothesis' proposed by James Lovelock in 1979, the atmosphere, the hydrosphere, and the lithosphere interact with the biosphere of the Earth, each being a compound component of a global unitary autopoietic, that is, a homeostatic self-regulating system. Sebeok, in Article 18, 'Evolutions of semiotics', notes:

In this view, all living entities, from their smallest limits to their largest extent, including some ten million existing species, form part of a single symbiotic ecological body dubbed Gaia. Greenstein (1988) is concerned with the more general proposition of the existence of a symbiosis between the universe on the one hand and life on the other. Should a view, along these lines, of a modulated biosphere prevail, it would in effect mean that all message generators/sources and destinations/interpreters could be regarded as participants in one gigantic semiotic web; and, if so, this would at the very least affect the style of future

semiotic discourse. (*S/S*, 1: 444. See also the entry ‘Gaia Hypothesis’, by Evan Thompson, *ES*: 253-256; and Art. 27, Ökosemiose [Environmental semiosis], by Günther Tembrock, *S/S*, 1: 571-591)

Today’s semiotic inquiry contradicts the idea of the individual as a separate and self-sufficient entity. The body of an organism in the micro- and macrocosm is not an isolated biological entity, it does not belong to the individual, to an individual sphere. This confirms cultural practices and worldviews that are now almost extinct, based on intercorporeity, interdependency, exposition and opening of the body (what we have today are mummified remains studied by folklore analysts or archeological remains preserved in ethnological museums and in the histories of national literature).

Think of how the body is perceived in popular culture as discussed by Mikhail Bakhtin (1963 and 1965), the forms of ‘grotesque realism’ which do not conceive the body and corporeal life individualistically or separately from the rest of terrestrial life, nor, indeed, from the world itself (see above). Signs of the grotesque body, of which only very weak traces have survived in the present day, include ritual masks, the masks used during popular festivities, carnival masks. ‘Grotesque realism’ (Bakhtin 1965) in medieval popular culture preexistent to the development of individualism in relation to the rise of bourgeois society, presents the body as undefined and not confined to itself, but, on the contrary, as flourishing in a relation of symbiosis with other bodies, in transformation and renewal processes which transcend the limits of individual life. Today's phase in the development of world communication does not at all weaken this individualistic, private and static conception of the body, but, on the contrary, reinforces it.

A global and detotalizing approach in semiotics demands availability, a disposition to listen to others in their otherness, a capacity for opening to the other, where such opening is not only quantitative (the omnicomprehensive character of global semiotics), but also qualitative. All semiotic interpretations by the student of signs, especially at a metasemiotic level, cannot leave out of consideration the dialogic relation with the other. Dialogism, in fact, is a fundamental condition for a semiotic approach in semiotics which though oriented globally, privileges the open orientation towards the particular and the local. Otherness obliges the totality to reorganize itself always anew in a process related to ‘infinity’, as ‘infinite semiosis’ (Peirce). This relation to infinity is much more than cognitive: beyond the established order, beyond the symbolic order, beyond our conventions and habits, it is a relation of involvement and responsibility. This relation to infinity is a relation to what is most refractory to the totality and, therefore, to the otherness of others, of the other person. ‘Other person’ not in the sense of another Self like ourselves, another *alter ego*, an I belonging to the *same community*, but another in his/her extraneousness, strangeness, diversity. This is about difference towards which Self cannot be indifferent in spite of all the efforts and guarantees offered by identity.

Seeking in the source

The title of this paragraph alludes to the title of a chapter in Sebeok’s book of 1979 (84-106), ‘Looking in the destination for what should have been sought in the source’. We propose to seek in the source as represented by the comprehensive view of semiotics subtending the whole plan of *Semiotik/Semiotics*. We believe that the source should in fact be sought in the

scientific and editorial work of Thomas A. Sebeok, who must also be counted among the figures who have most contributed by the promotion of semiotics, to organizational activities, to its institutionalization internationally and, therefore, to its current configuration.

As stated above, the foundational scope of *Semiotik/Semiotics* coincides with the view proposed by Sebeok's holistic, ecumenical or, to use his most recent denomination, *global* semiotics. The editorial enterprise achieved with this Handbook as well as many issues covered by entries in *Encyclopedia of Semiotics* could not have existed outside Sebeok's semiotic enquiry. As we know, the substantives 'endosemiotics' and 'zoosemiotics' were coined by Sebeok in 1972 and 1976 respectively, and while the term 'biosemiotics' already existed, Sebeok is a pioneer in this particular field and its major promoter (cf. the entry 'Biosemiotics' by Hoffmeyer, *ES*, in which another mentioned scholar in this field is Bateson). With respect to *Semiotik/Semiotics*, Sebeok is not only one of the editors, but he who created the conditions which made it possible to devise the general plan for this work. Consequently, we believe it useful for the reader of this article-review to have some information about the route followed by Sebeok's search. However in what follows we shall limit ourselves to briefly considering some important works by Sebeok published prior to *Semiotik/Semiotics*.

Over a decade (1976-86) Sebeok published his tetralogy *Contributions to the Doctrine of Signs* (1976), *The Sign & Its Masters* (1979), *The Play of Musement* (1981), *I Think I Am a Verb* (1986). Since then other important volumes have followed in rapid succession, they include: *Essays in Zoosemiotics*, 1990, *A Sign is Just a Sign*, 1991, *American Signatures*, 1991, *Semiotics in the United States*, 1991, *Signs. An Introduction to Semiotics*, 1994. Nor must we forget important earlier volumes by Sebeok such as *Perspectives in*

Zoosemiotics, 1972, and numerous others under his editorship including *Animal Communication*, 1968, *How Animals Communicate*, 1977, *Sight, Sound, and Sense*, 1978. Rather than continue this long list of publications, it will suffice to remember that Sebeok has been publishing since 1942. His writings are the expression of ongoing research and probing reflection conducted over more than half a century as he interprets the semiotic universe, whose infinite multiplicity, variety and articulation he has substantially contributed to manifesting. On the extension and depth of Sebeok's research and the problematics dealt with, Lévi-Strauss has commented as follows:

A lire les ouvrages de Sebeok, on est confondu par sa familiarité avec les langues et les cultures du monde, par l'aisance avec laquelle il se meut à travers les travaux des psychologues, des spécialistes de neuro-physiologie cérébrale, de biologie cellulaire, ou ceux des éthologues portant sur des centaines d'espèces zoologiques allant des organismes unicellulaires aux mammifères supérieurs, en passant par les insectes, les poissons et les oiseaux. Ce savoir plus qu'encyclopédique se mesure aussi aux milliers de noms d'auteurs, de langues, de peuples et d'espèces composant les index des ouvrages écrits ou dirigés par lui, et à leurs énormes bibliographies. (Lévi-Strauss, 'Avant-Propos', in Bouissac, Herzfeld, Posner, eds., 1986: 3)

In *Contributions to the Doctrine of Signs*, despite such a totalizing orientation in semiotics, Sebeok neither designates it with the ennobling name 'science' nor with the term 'theory'. Instead, he chooses the expression 'doctrine of signs' adapted from John Locke who maintained that a doctrine was nothing more than a body of principles and opinions vaguely forming a field of knowledge. At the same time, however, Sebeok also uses this expression with

the meaning conferred upon it by Peirce, a meaning charged with the instances of Kantian critique. In other words, not only does Sebeok confer upon semiotics the role of observing and describing phenomena, in this case signs, but also of interrogating the conditions of possibility of signs which are characterized and specified for what they are, as emerges from necessarily partial and limited observation, and for what they must be (cf. Sebeok's Preface to his book of 1976). This humble and together ambitious character of the 'doctrine of signs' leads it *à la* Kant to interrogate its own conditions of possibility: the doctrine of signs is the science of signs which calls itself into question, attempts to answer for itself, and researches into its own foundations.

Contributions to the Doctrine of Signs has a strong theoretical bias for in it Sebeok already expresses his preference for interpretation semiotics. Instead, *The Play of Musement*, a collection of papers, explores the efficaciousness of semiotics as a methodological tool and the potential range of its application, and does so in more discursive terms. The 'play of musement' is semiotics conceived as an exclusively human style of inquiry, as human understanding. The exquisitely human propensity for musement implies the ability to carry out such operations as predicting the future or 'traveling' through the past, in other words, the ability to construct, deconstruct and reconstruct reality inventing new worlds and interpretive models. In both these books Sebeok's interpreters are faced with an orientation that is rooted and consolidated in his theoretical formation.

By contrast, *The Sign & Its Masters*, the in-between book, considers the different possibilities which branch out from our two semiotic alternatives thus described, code semiotics and interpretation semiotics. In fact, in addition to being a compact theoretical book, *The Sign & Its Masters* also offers a survey of the various alternatives, positions and phases in sign studies expressed by important scholars who have dealt with signs either directly or indirectly.

Sebeok opens *The Sign & Its Masters* with a description of this book of 1979 as ‘transitional’. In truth, this is a remark that may be extended to the whole of his research if considered in the light of recent developments in philosophico-linguistic and semiotic debate, and, therefore, to the transition from ‘code semiotics’ which is centered on linguistics and consequently verbal signs, to ‘interpretation semiotics’ which unlike the former accounts for the autonomy and arbitrariness of nonverbal signs as well, whether ‘cultural’ or ‘natural’.

In his survey of the problems relevant to semiotics and the masters of signs, Sebeok discusses various aspects characterizing these two different modalities of practising semiotics, which may be very simply summarized with two names — de Saussure and Peirce. The study of signs is ‘in transit’ from ‘code semiotics’ to ‘interpretation semiotics’ as represented by these two emblematic figures, and in fact has now decidedly shifted in the direction of the latter.

Sebeok’s critique of anthropocentrism and glottocentrism orients the general direction of his semiotic discourse and may be extended to all those trends in semiotics which look to linguistics for their sign model. For what concerns Sebeok, his interest in cultural processes at the intersection between nature and culture induces him to consider the research of such scholars as the biologist Jakob von Uexküll, one of the so-called ‘criptosemioticians’ he has studied most.

To free oneself from the anthropocentric perspective as it has characterized semiotics generally implies to take into account other sign systems beyond those that are specific to mankind. These sign systems are not alien to the human world, however they do not specify it. They concern the encounter between human communication and the communicative behavior of nonhuman communities within the species and with the environment, as well as the sphere

of endosemiotics, the study of sign systems inside the body on both an ontogenetic and phylogenetic level.

Sebeok's position succeeds in avoiding any form of biologism as occurs when human culture is reduced to communication systems that can be traced in other species; just as he avoids, vice versa, the anthropomorphic reduction of nonhuman animal communication to characteristic traits and models specific to mankind.

Consequently, his doctrine of signs insists particularly on the autonomy of nonverbal sign systems from the verbal. Such autonomy is demonstrated through the study of human sign systems which depend on the verbal only in part, in spite of the predominance of verbal language in the sphere of anthroposemiosis.

Sebeok's writings transform us into direct witnesses and interpretants of (abductive) turning points in his research as he experiments, discusses, and evaluates different methods of semiotic inquiry, identifies possible objects of analysis and outlines the boundaries, or, better, suggests the boundlessness of semiotics as a disciplinary field. From this point of view *The Sign & Its Master*, but, in reality, the overall orientation of Sebeok's research, is transitional. In fact it contributes significantly to the shift towards interpretation semiotics, freed once and for all from subordination to (Saussurean) linguistics and from false dichotomies: communication semiotics vs signification semiotics, referential semantics vs nonreferential semantics.

I Think I Am a Verb is a book which at once assembles a broad range of interests and which also acts as a launching pad for new research itineraries in the vast region of semiotics. The title evokes the dying words of the 18th President of the United States, Ulysses Grant, which ring with Peircean overtones. In fact, in Peirce's view man is a sign and Sebeok's choice of a verb instead of a noun to characterize this sign (which not only each one of us is, but

also the whole universe in its globality) serves to underline the dynamic and processual character of semiosis.

A fundamental point in Sebeok's doctrine of signs is that living is sign activity, so that to maintain and to reproduce life, and not only to interpret it at a scientific level, are all activities that necessarily involve the use of signs. Sebeok theorizes a direct connection between the biological and the semiotic universes, and, therefore, between biology and semiotics. His research would seem to develop Peirce's conviction that man is a sign with the addition that this sign is a verb: to interpret. And in Sebeok's particular conception of reality, the interpreting activity coincides with the activity of life, and in his own personal case, with the whole of his life. If I am a sign, as he would seem to be saying through his life as a researcher, then nothing that is a sign is alien to me — *nihil signi mihi alienum puto* —; and if the sign situated in the interminable chain of signs is necessarily an interpretant, then 'to interpret' is the verb that may best help me understand who I am.

Sebeok's position is distant from Saussure's who limited the sign science to the narrow spaces of the signs of human culture and, still more reductively, to signs produced intentionally for communication. Instead, for Sebeok no aspect of sign life must be excluded, just as no limits are acceptable on semiotics, whether contingent or deriving from epistemological conviction. At the same time, however, contrary to eventual first impressions, Sebeok's work discourages any claims to the status of scientific or philosophical omniscience, and to the ability to solve all problems indiscriminately.

In Italy long before Eco (1975) defined semiotics as the discipline that studies lying, Giovanni Vailati before him had realized that signs may be used for deviating and deceiving and, in fact, entitled his review of Giuseppe Prezzolini's *L'arte di persuadere*, 'Un manuale per bugiardi' ('A handbook for

liers’). (Vailati’s collected writings are now available in a work of 1987 in three volumes; see also Vailati 2000). Deception, lying, and illusion are forms of behavior which a semiotician like Sebeok, seduced by signs wherever they occur, cannot resist. For example, he is attracted by the signs of the magician and constantly returns to forms of behavior and situations of the Clever Hans type — the horse which presumably knew how to read and write, but which in reality was an able interpreter of the signals which were communicated to it by its trainer either inadvertently, or voluntarily through an intentional attempt at fraud (cf. Sebeok, ‘Looking in the destination for what should have been sought in the source’, in Sebeok 1979: 85-106).

Sebeok explores the capacity for lying in the nonhuman animal world; an interest we believe has two main motivations. The first concerns his commitment to contradicting the belief that animals can ‘talk’ in a literal sense, with which they are invested with a characteristic that is species-specific and exclusive to humankind. In certain cases this involves unmasking the fraudulent acts of impostors, in others it involves undermining illusions. Sebeok has often contributed with theoretical discussions, documentation, and even parody (cf. ‘Averse Stance’, in Sebeok 1986a: 154-148) to semiotic debate on the impossibility of establishing a homological relation between human verbal language and animal language.

The second motivation is related to Sebeok’s wish to explore the fascinating question of whether nonhuman animals lie as well given that signs do not belong exclusively to the human world, as evidenced by studies in zoosemiotics, and that to use signs also means to know how to lie (cf. ‘Can Animals lie?’, in Sebeok 1986a: 126-130).

We believe that Sebeok’s awareness of the vastness, variety and complexity of fields and problems of semiotics confers an extreme sense of prudence,

problematicity and humility on the interpretations he hazards not only when venturing over the treacherous territory of signs, but still more in relation to the deceptive sphere of the signs of signs — the place of his semiotic probing.

We have already discussed some parts of *A Sign is a Just a Sign* above, and will turn to this book (in particular Chp. 5, ‘In what sense is language a “Primary Modeling System”?’ (now also in *Signs*) to deal with the question of the origin of language.

In *Semiotics in the United States*, Sebeok analyzes U.S. semiotics at three different levels, at once closely interrelated and yet easily identifiable.

At the *first* level he makes both a synchronic and diachronic survey of the various theoretical trends, perspectives, problems, fields, specializations and institutions that characterize U.S. semiotics. Regarding the diachronic perspective, Sebeok assumes the difficult task of reconstructing the origins of American semiotics. He researches them in discourse that was not yet connoted as semiotics at the time and that, in certain cases, is still today considered as only marginally associated with semiotics or completely distant from it.

The *second* level is theoretical and critical. Sebeok takes a stand with respect to given problems in semiotics which include: problems of a general order concerning, for instance, the delimitation of the field of semiotics or the construction of a general sign model; and problems of a more specific order concerning the various sectors and subsectors of the science, or ‘doctrine of sign’. The impression which Sebeok would seem to confirm here and there is that this more problematic level sets the perspective for the whole volume: it completes the first level and avoids limiting the volume to pure historical descriptivism.

The *third* level is connected to the second in the sense that while developing and illustrating his theoretical views, Sebeok colors them with

personal overtones and most often with amusing biographical anecdotes. There are very few pages in *Semiotics in the United States* where Sebeok does not figure as one of the characters populating the stories, episodes, and enterprises forming his narration. In fact, this is largely due to his surprising and perhaps unprecedented involvement in the organization and promotion of the semiotic science at a world level — a cause to which he has been committed since the gradual emergence of semiotics as a discipline in its own right. Sebeok has been in direct contact with many of the authors mentioned in his volume and has many ‘memories’ of personal experiences with them, consequently these memories have found their way into his description of the problems and orientations characterizing the semiotic globe.

Sebeok’s interests cover a broad range of territories ranging from the natural sciences to the human sciences (see Sebeok, ‘Signs, Bridges, Origins’, in Sebeok 2001b: 59-73). Consequently, he deals with theoretical issues and their applications from as many angles as are the disciplines called in question: linguistics, cultural anthropology, psychology, artificial intelligence, zoology, ethology, biology, medicine, robotics, mathematics, philosophy, literature, narratology, and so forth. The initial impression might be that he proceeds rather erratically as he experiments varying perspectives and embarks upon different research ventures. In reality, his expansive and seemingly distant interests find a focus in his ‘doctrine of signs’, and in the fundamental conviction subtending his general method of enquiry that the universe is perfused with signs, indeed, as Peirce hazards, may be composed exclusively of signs.

As a fact of signification the entire universe enters Sebeok’s ‘global semiotics’ (see Sebeok 2001b). Semiotics is the place where the ‘life sciences’ and the ‘sign sciences’ converge, therefore where consciousness is reached of

the fact that the human being is a sign in a universe of signs. Says Sebeok in his 'Introduction' to *Global Semiotics*:

In sum, *global semiotics* can be seen as composed of two partially overlapping estates: 'normal' semiotics, as defined above, the subject matter of which is, intrinsically, Minds, Models, and Mediation; and biosemiotics, all this and much, much more, as presented throughout this book. Needless to point out, practitioners of the discipline may be qualified to work in one aspect or the other, or, as a rule, in one or more fractions of the supervening category. Scarce is the polymath of the magistral stature of, say, Charles Peirce, capable of reaching athwart more than a couple of divisions, especially across the humanities and the sciences, which are perhaps uniquely bridged by semiotics (as argued in Chp. 5 [Signs, bridges, origins]). (Sebeok 2001b: xxii)

Through his numerous publications Sebeok has propounded a wide-ranging vision of semiotics that coincides with the study of the evolution of life. After Sebeok's work both the conception of the semiotic field and history of semiotics are changed noticeably. Thanks to him semiotics at the beginning of the new millennium presents a far more enlarged view than that of the first half of the 1960s.

Language and evolution of anthroposemiosis

In Article 18, 'The evolution of semiosis', § 5 treats the origins of anthroposemiosis and consequently its distinctive feature with respect to remaining zoosemiosis, namely language. 'Hominid forms, which evolved out of

the australopithecines, include *Homo habilis* ('handy man', 2.4 to 2.0 million years ago), first described in 1964, which is the first hominid with a distinctly enlarged brain (600-800 cm³). It appears virtually certain that *habilis* had language, as an *interior modeling device, although not speech*. As we have said already, a modeling system is a tool with which an organism analyzes its surroundings. Language-as-a-modeling-system seems to have always been an exclusive property of the genus *Homo*. Members of early hominid species communicated with each other by nonverbal means, in the manner of all other primates. *Homo erectus* too ('upright man' over 1.5 million years ago) with a brain volume of 800-1,200 cm³ and a far more elaborate tool kit, including fire, *had language, yet not speech* (cf. 443; see also Sebeok 1986a, 1991a, 1994b).

Speech did not appear until our own immediate archaic *sapiens* ('wise man') ancestors (about 300,000 years ago), with brain volumes of about 1,200-1,400 cm³ and with even more elaborate tools and behaviors, for example, hafting, ritual burials, and central-place foraging. Evidence for rule-governed behavior indicates that *Homo sapiens* not only had language but manifested it in the form of speech as well. Modern *sapiens sapiens* (that is, ourselves) is a subspecies of archaic *sapiens* (appearing only some 100,000 to 40,000 years ago), with an average brain capacity of 1,500 cm³ (cf. 443).

Thus while language as a specific human primary modeling system emerged on the scene perhaps 2.5 or 3.0 million years ago, verbal language or speech appeared solely in *Homo sapiens* as a communication system and developed little by little in *Homo sapiens sapiens* also as a cognitive system, namely as a second modeling system.

Stressing the species-specific character of human language, Sebeok, with Jean Umiker-Sebeok, intervened polemically and ironically with regard to the enthusiasm (which he attempted to cool down) displayed for theories and

practices developed for training animals, based on the assumption that animals can talk (cf. Sebeok 1986a, Chp. 2) Furthermore, the distinction between *language* and *speech* and the thesis that language appeared much earlier than speech in the evolution of the human species add a further element to the critique of phonocentrism. Language (on this point Sebeok is in accord with Chomsky though the latter does not clearly distinguish between language and speech) is not reducible to a communicative device; in other words, the specific function of language in the evolution of anthroposemiosis was not to transmit messages and give information.

As anticipated, according to Sebeok, all animal species have models to construct their world, and language is the model belonging to human beings. However, the distinctive feature of language with respect to other zoosemiotic systems (although, as we have said, this feature is present in endosemiotic systems, such as the genetic code, the immune code, the metabolic code, and the neural code) is syntax, through which the same construction pieces may be assembled in an infinite number of different ways. Consequently, the human primary modeling system is able to produce an indefinite number of models and worlds.

All species communicate in a world which is peculiar to that species alone and which ensues from the type of modeling that species is capable of (cf. J. von Uexküll 1967 [1934], 1992). Very early in development as a hominid, the human species was endowed with a modeling device capable of producing an infinite number of worlds; this fact explains the evolution of hominids into *homo sapiens sapiens*. The reason why it is possible for such animals to produce a limitless number of worlds is that the human modeling device, or language, functions in terms of syntax, that is, in terms of construction, deconstruction and reconstruction with a finite number of elements which may be composed and

recomposed in an infinitely great variety of different forms. The great multiplicity of languages and of elements (or dimensions) forming each one of them (the phonological, syntactic, semantic) all depend on this modeling device. Thanks to this syntactic quality, that which was previously organized in a certain way can be reorganized differently. The human modeling device endowed with syntax, human thought, is capable of the work of bricolage. By virtue of his studies on ‘la pensée sauvage’ Claude Lévi-Strauss may be counted among those researchers who has also contributed greatly to identifying and illuminating such a human capacity. The capacity for syntax and reorganization presupposes the ability characteristic of language to reflect upon itself. We are referring to the ability to reflect on materials, means and models, on that which has already been modeled to the end of using such materials in new modeling processes. This ability is what we intend by metasemiosis, that is, what we are calling semiotics. Language and therefore the work of syntax is semiotical.

At this point we must specify that when we speak of syntax we are not just referring to one of the three dimensions of semiotics, the other two being semantics and pragmatics (cf. Morris 1938b; *S/S*, articles 2, 3, 4, 113). Syntax is part of each of the three ‘dimensions’, as Charles Morris calls them. Or, if we consider ‘grammar’ in relation to verbal language as being formed of a phonological, semantic and syntactic component, along the lines proposed by Noam Chomsky, we must now clarify that syntax is also present in the other two components. In our opinion, there is a syntax of phonemes which gives rise to phonemes, and there is a syntax of monemes which gives rise to the words of a language even before such words (the categorematic and syncategorematic terms) are organized by syntax properly understood. Consequently, syntax is language itself considered from the viewpoint of its constructive, deconstructive

and reconstructive capacity, just as semiotics is language considered in terms of the capacity for metasemiosis.

Language as a modeling device has an iconic relation with the universe it models. With such a statement, we recall especially Peirce and Jakobson as well as Sebeok, but an equally important connection may be made with Wittgenstein's *Tractatus*, particularly with the notion of 'picturing.'

Wittgenstein begins his work on language-thought production processes and on semiotic-cognitive procedures in his *Tractatus*. However, this aspect of his research is subsequently left aside in his *Philosophical Investigations* where attention is focused on *meaning as use* and on linguistic conventions (linguistic games). The importance attributed to the 'turn' operated by the *Philosophical Investigations*, especially by the analytical philosophers, must not lead one to lose sight of the importance of the *Tractatus*, particularly in regard to the *iconic* aspect of language (cf. Ponzio, 'Segno e raffigurazione in Wittgenstein', in Ponzio 1997b: 309-313). In *Semiotik/Semiotics*, Article 109 on Wittgenstein as anticipated by its title 'Wittgenstein and Ordinary Language Philosophy' (by Rom Harré, *S/S*, 2: 2173-2183) only deals with the so-called second Wittgenstein. Instead, the entry 'Wittgenstein, Ludwig' in *Encyclopedia of Semiotics* pays due attention to Wittgenstein's 'picture theory of the proposition'. In *Tractatus* Wittgenstein distinguishes between names and propositions: the relation between names or 'simple signs' used in the proposition and their objects or meanings, is of the conventional type. The relation between whole propositions or 'propositional signs' and what they signify, is a relation of similarity. The proposition is a *logical* picture (cf. *Tractatus* 4.022 and 4.026). As much as propositions are also conventional-symbolic, fundamentally they are based on a relation of similarity, that is, an iconic relation, as Peirce and Jakobson also state (see Ponzio 1997b: 309-313).

The iconic character of the proposition means that picture theory is slightly more complex than its interpretation as isomorphic similarity would lead us to believe. According to the distinction proposed by Rossi-Landi between analogy, isomorphism and homology, the kind of similarity involved by the icon is homological, that is structural and/or genetic.

By virtue of its syntactic component, language does not represent immediate reality. Sebeok (1991a: 57-58) observes that on account of this feature, language is, *properly speaking*, a secondary modeling system. The relatively simple, nonverbal models that nonhuman animals live by and that normal human infants likewise employ are indeed kinds of primary modeling. These models are more or less pliable representations that must fit ‘reality’ sufficiently to tend to secure survival in one's *Umwelt*.

Such ‘top-down’ modeling (to use a current jargon borrowed from the cognitive sciences) can persist, and become very sophisticated indeed in the adult life of exceptionally gifted individuals, as borne out by Einstein’s testimonial or by what we know about Mozart’s or Picasso’s ability to model intricate auditory or visual compositions in their heads in anticipation of transcribing this onto paper canvas. This kind of nonverbal modeling is indeed primary, in both a phylogenetic and an ontogenetic sense. ... Syntax makes it possible for hominids not only to represent immediate ‘reality’ (in the sense discussed above) but also, uniquely among animals, to frame an indefinite number of possible worlds in the sense of Leibniz). (Sebeok 1991a: 57-58)

The implications of such an approach to the relationship between language and the world not only involves theory of knowledge, but also study of cognitive processes and psychology, which Sebeok addresses directly in terms of

psycholinguistics and psychosemiotics (both lacking as entries in *Encyclopedia of Semiotics*). Connecting semiotics with neuro-biology, he considers the mind as a system of signs or as a model representing what is commonly called *Umwelt*. The world is an icon of given pertinent space/time relationships which are fixed, modified and fixed again in the organism's *Innenwelt*, and are interpreted in the chain of deferrals from the sign to the interpretant (see Sebeok 1986a, Chp. 7).

Let us now return to the relation between language and speech. As Danesi (1998: 28) explains referring to the second chapter in Sebeok 1986a 'Communication, Language, and Speech. Evolutionary Considerations', it is a mistake to think of language as having developed primarily out of a need to communicate: language is essentially 'mind work'; speech is 'ear and mouth work'.

In Article 18, 'Evolution of semiosis', Sebeok briefly mentions the 'exaptation' processes of language into speech (and into other manifestations such as script), and vice versa of speech into language. In other works Sebeok deals with adaption and exaptation in language and speech, which being pivotal processes in the evolution of anthroposemiosis are topics that belong to anthroposemiotics (cf. Sebeok 1991a). 'Exaptation' is a term coined by paleontologists Stephen Jay Gould and Elizabeth Vrba, as a counterpart to the Darwinian notion of 'adaptation'. *Encyclopedia of Semiotics* includes the entry 'Exaptation' (225-226, by Michael Ruse, who is also the author of the entry 'Evolution', 223-225). Divided in two kinds, exaptations can arise either in a situation in which 'a character, previously shaped by natural selection for a particular function (an adaptation), is coopted for a new use' or when 'a character whose origin cannot be ascribed to the direct action of natural selection ... is coopted for a current use' (Gould and Vrba 1982: 5).

Observes Ruse:

The idea of an exaptation is one with obvious implications for any biological theory of communication, such as that of Noam Chomsky, which wants to locate language in evolution but has trouble seeing how the Darwinian mechanism of natural selection can do all that is required. (*ES*: 226)

The plurality of natural languages (and the 'inner plurilingualism' of any single natural language) cannot be explained (the 'Babel enigma') by Chomsky's linguistics in spite of its insistence on the 'creative character of (verbal) language', given that it presupposes an innate Universal Grammar. The plurality of languages and 'linguistic creativity' (Chomsky) testify to the capacity of language, understood as a primary modeling device, for producing numerous possible worlds. Both derive from the capacity of human modeling to invent multiple worlds, i.e. from its gift for the 'play of musement'. 'Purport', according to Hjelmslev (1953: 32-33), is an amorphous continuum 'on which boundaries are laid by the formative action of language'. Language articulates the shapeless purport of expression and content in different ways in different languages. For instance, the human phonic material of purport is divided into different *figurae* (phonemes) by different languages; and the color continuum is divided differently, e.g. within English and Welsh (see above-mentioned Article 19 on Hjelmslev, § 3 and 4, *S/S*, 2: 2275-2282). All this may be explicated on the basis of the creativity which characterizes language as a species-specific human modeling device. To use Rossi-Landi's terminology, 'linguistic work' produces different paradigms corresponding to the various worlds of different languages. The same thing happens in the articulation and organization of the social continuum in the various cultures, for instance in the relationship systems

analyzed by Lévi-Strauss (see § 19 on structuralism in Article 74, , *S/S*, 1: 1454-1456. See also Ponzio 1997b: 191-218; Ponzio, Calefato, and Petrilli 1999: 50-53).

The fact is that Chomsky's language theory does not keep account of the difference between language and speech. And the theory of the origin of verbal language also very often fails to make this difference. The consequence is that Chomsky's language theory attempts to explain the different historical grammars of natural languages in terms of a hypothetical universal grammar, while the latter approach searches for the origin of natural languages in another (primordial) natural language. Instead, the origin is in the human species-specific primary modeling device, i.e., in Sebeok's terminology, language, which was a primary evolutionary adaptation of hominids. Speech developed out of language, and like language made its appearance as an adaptation, but for the sake of communication and much later than language, precisely with *Homo sapiens*, not more than about 300,000 years ago. Only after evolution of the physical and neurological capacity for speech in *Homo sapiens* was speech possible, i.e., use of language for vocal communication. Consequently, language too ended up becoming a communication device; and speech developed out of language as a derivative exaptation. Exapted for communication, first in the form of speech and later of script (cf. *S/S*, 1: 443), language enabled human beings to enhance the nonverbal capacity (see 'Nonverbal bodily sign categories', by Fernando Poyatos, *ES*: 451-453) with which they were already endowed. On the other hand, speech came to be *exapted* for modeling and to function, therefore, as a *secondary modeling system*. Beyond increasing the capacity for communication, speech also increases the capacity for innovation and for the 'play of musement'.

Concerning the relation between language and speech, Sebeok remarks that it has required a plausible mutual adjustment of the encoding with the decoding capacity. On the one hand, language was ‘exapted’ for communication (first in the form of speech, i. e., for ‘ear and mouth work’ and later of script, and so forth), and, on the other, speech was exapted for (secondary) modeling, i.e., for ‘mind work’. ‘But’, adds Sebeok, ‘since absolute mutual comprehension remains a distant goal, the system continues to be fine-tuned and tinkered with still’ (Sebeok 1991a: 56):

As to why this process of exaptation took several million years to accomplish, the answer seems to be that the adjustment of a species-specific mechanism for encoding language into speech, that is, producing signs vocally, with a matching mechanism for decoding it, that is, receiving and interpreting a stream of incoming verbal/ vocal signs (sentences), must have taken that long to fine-tune a process which is far from complete (since humans have great difficulties in understanding each other’s spoken messages). (*S/S*, 1: 443-444)

But we also find another process of exaptation in the evolution of anthroposemiosis. We are referring to the separation between manual work and intellectual work, which coincides with the separation between ‘nonlinguistic’ [nonverbal] or ‘material’ work and ‘linguistic [verbal] work’, to use Rossi-Landi’s terminology. The expressions ‘linguistic work’ and ‘nonlinguistic work’ are convenient abstractions. However, we should note that they are more than this: they are ‘concrete abstractions’. More than just simply convenient expressions of conceptual operations carried out in a theoretical context, they are also aspects of historico-social reality itself. From this second point of view these two abstractions really exist, they are part of historical reality. Given that

verbal linguistic work is functional not only to communication but also to modeling, it presents a fundamental condition with respect to nonlinguistic work. All nonlinguistic work takes place on the basis of the instruments, materials and models of linguistic work. Today's automatic machine represents one of the highest results of exaptation of linguistic work for production and profit, with all the derivative difficulties and contradictions in social relationships of production that ensue.

This subject belongs to the problem of the relation between machine semiosis and linguistic semiosis. But before we deal with this, let us add some reflections on language and writing.

Language and anthroposemiosis in Morris

We shall now complete our exposition of certain aspects of the relation between language and speech and of the implication of this relation for human evolution according to Sebeok, by considering yet another important moment in the history of semiotics for the focalization of this pivotal topic. We are alluding to a contribution that has not yet received the attention it deserves. Our reference is to Morris's conceptualization of 'language' and therefore its correlate 'general linguistics'.

Morris divides signs into two categories: *signals* and *symbols*. This distinction is recurrent in studies on language and symbolism. He focuses particularly on Suzanne K. Langer, in Thomas A. Sebeok's description a scholar highly indebted to her teacher Alfred North Whitehead, but afterwards under the powerful spell of Ernst Cassirer (cf. Sebeok and Petrilli 1998, now in Sebeok 2001b: 145-153, particularly: 148-149; cf. also Sebeok 1995). Morris (1964)

acknowledges the importance of Cassirer's own contribution to this issue as in the following opening remarks to *Signification and Significance*:

Ernst Cassirer called man 'the symbolic animal', instead of 'the rational animal', and much contemporary work has shown the aptness of this conception. (Morris 1971: 402)

Cassirer's notion of symbol is connected with two concepts focalized in his book of 1910: '*Substanzbegriff*' and '*Funktionsbegriff*'. As showed in Article 111, 'Cassirer und Seine Nachfolger' ['Cassirer and his followers'] (by Heinz Paetzold, *S/S*, 2: 2191-2198), Cassirer's concepts of *function* and *substance* are closely connected with the concept of *form*. This article on Cassirer emphasizes the role of his 1910 work *Substanzbegriff und Funktionsbegriff* in his following research. The formation of concept (*Begriffsbildung*) is presented in Cassirer's book of 1910 in terms of function and form. In volume I, *Die Sprache*, of *Philosophie der symbolischen Formen* (1923), language is presented as *form* and the study of language is conceived as analysis of the functions generating linguistic *form*. But in his book of 1923 is added another notion: *symbol*. Thus form is 'symbolic form' (see also § 74, 'Cassirers Synthese', 1441-1443) in Chapter X, *S/S*, 2). The Kantian matrix of Cassirer's conception of language offers another perspective with respect to Chomsky's Cartesian linguistics: a Kantian linguistics to which belong also, besides Cassirer, students such as Peirce, Husserl, Morris (see Ponzio, 'Function and structure in Cassirer's linguistics', in Ponzio 1974: 121-149; and Ponzio 1997b: 307-309).

According to Morris (1946), a sign is a symbol when it substitutes another sign to orient behavior, wherewith it signifies what the substituted sign signifies; otherwise, it is a signal. In other terms, a symbol is 'a sign that is produced by its

interpreter and that acts as a substitute for some other sign with which it is synonymous; all signs not symbols are signals' (1971: 367). On the other hand, the signal is 'a sign that is not a symbol, that is, not produced by its interpreter and not a substitute for some other sign with which it is synonymous' (366).

In Langer's view (1942: 61), signals are signs that '*announce* their objects', while symbols lead their interpreters to '*conceive their objects*'. In her own words:

A sign [that is, a signal] indicates the existence — past, present or future of a thing, event, or condition. Wet streets are a sign that it has rained. A pattering on the roof is a sign that it is raining. A fall of the barometer or a ring around the moon is a sign that it is going to rain. ... A whistle means that the train is about to start. (57-58, cited from Morris 1971: 126)

On Morris's (1946) account an important difference between signals and symbols consists in the fact that the symbol is a less reliable sign than the signal, since it is produced by the organism or interpreter, while the signal being more closely connected with external relations in the environment tends to be more reliable. However, Morris also adds that signals have different degrees of reliability, so that the difference with respect to symbols remains one of degree (cf. Morris 1971: 126-127).

As emerges from his definition, the symbol is 'autonomous' given that it is produced by its interpreter, therefore independently of a given external environment. It is also 'conventional', 'in the sense that no limit is set upon the actions and states and products of the organism that may operate as synonymous signs substituting for other signs'. 'Variability' is another eventual characteristic of the symbol, 'where it is "decided" what is to be used as a symbol', though

voluntary decision is not necessarily involved in the determination of what is a symbol (cf. 102). Morris's concept of *symbol* is similar to Peirce's, while his concept of *signal* is similar to the Peircean concept of *index*. All the same, the difference between Morris's dichotomous and Peirce's trichotomous scheme is substantial. Moreover, while Peirce classifies the *icon* as a third type of sign with respect to the symbol and the index, Morris considers it as a mere subclass of the symbol (cf. 102).

Working in the perspective of a general theory of behavior, Morris wished to determine the criteria to define the term 'language', being a term that is ambiguous but fundamental in the field of semiotics (cf. 112). We believe that the part in question in *Signs, Language, and Behavior* (112-128) is among the most valid and topical. It is significant that after having described sign behavior with general reference to the organism (in Sebeok's words, after having identified semiosis and life), Morris then proceeds to consider the distinction between 'non-human and human sign-behavior' (128-134). Important points in Morris's conception of language with respect to its interpretation in the perspective of global semiotics would seem to be the following.

1) Morris works towards a definition of *language* that is not necessarily connected to communication. A definition of language must prescind from communication and not be grounded in it. This in turn implies that communication must be distinguished from language: in fact, the term 'communication' must not be limited to linguistic communication (cf. 115).

2) Another fundamental aspect of Morris's work lies in the fact that he does not consider the presence of words or spoken sounds as a requisite for language, even though language is this as well. In other words, in Morris's *view language cannot be reduced to speech*, while speech is a specification of language. By 'language' Morris intends acoustic language as much as the visual

or the tactile, etc., depending on the kind of sign-vehicle which intervenes and which is not necessarily limited to the verbal in a strict sense.

Morris's uses the term 'language' in an altogether different sense from the linguists. Differently to various trends in semiotics and semiology, semiotic as conceived by Morris is not dependent on or subordinate to linguistics. The autonomy of his approach to semiotics with respect to linguistics is obvious throughout the whole course of his research, and induces him to comment that professional linguists

will object to our omission from the definition of language the requirement that language signs be spoken sounds. On our part we see no theoretical reasons for the inclusion of such a requirement; to insist on it would be comparable to insisting that buildings made of different materials should not all be called buildings (116).

3) In spite of the linguists, therefore, Morris proposes the expression 'general linguistics' to name the study of language in general, while he reserves the term 'linguistics' for the study of written and spoken languages insofar as they are subclasses of language.

He proposes five criteria for definition of the term 'language' (cf. 112-114):

- i) a language is composed of a plurality of signs;
- ii) in a language each sign has a *signification common to a number of interpreters*: this is linguistic signification which is common to members of the interpreter-family, there may of course be differences of signification for individual interpreters, but such differences are not then regarded as linguistic;

iii) the signs constituting a language must be *comsigns*, that is, producible by the members of the interpreter-family. Comsigns are either activities of the organisms themselves (such as gestures), or the products of such activities (such as sounds, traces left on a material medium, or constructed objects);

iv) the signs which constitute a language are plurisituational signs, that is, signs with a relative constancy of signification in every situation in which a sign of the sign-family in question appears;

v) the signs in a language must constitute a system of interconnected signs combinable in some ways and not in others in order to form a variety of complex sign-processes.

On the basis of these requirements Morris proposes the following definition of a language:

a language is a set of plurisituational signs with interpersonal significata common to members of an interpreter-family, the signs being producible by members of the interpreter-family and combinable in some ways but not in others to form compound signs. (113)

Morris now proceeds to distinguish between human and nonhuman signs. The question is simply whether language as defined according to the five criteria is exclusive to man or is present in nonhuman organisms as well (cf. 128-131).

If 'language' is considered to be synonymous with 'communication', animals no doubt also possess language. On the contrary, if language is distinguished from communication and determined according to the five criteria mentioned above, then animals certainly do not have language, though they do

communicate. Some of the conditions which allow for language would seem to occur in animals, however, they do not occur together.

At this point the following statement made by Morris would appear to be important:

But even if these conditions were met [that is, if all five criteria are jointly met in living beings other than men], the fifth requirement is a harder hurdle. For though animal signs may be interconnected, and interconnected in such a way that animals may be said to infer, there is no evidence that these signs are combined by animals which produce them according to limitations of combinations necessary for the signs to form a language system. Such considerations strongly favor the hypothesis that language — as here defined — is unique to man. (130)

The implication is that one of the distinctive features of human language by contrast with nonhuman animals is the capacity to combine signs so as to form compound signs. In the last analysis, therefore, it would seem that the ‘capacity for combination’ is the most distinctive element when distinguishing between human and nonhuman signs. This conception is very close to Sebeok’s when he states that language (which he too distinguishes from the communicative function) is characterized by *syntax*, that is, the possibility of using a finite number of signs to produce an infinite number of combinations on the basis of given rules. Morris concludes his discussion of the distinction between nonhuman animal signs and human signs in the following terms:

In all these ways, human language (and the post-language symbols it makes possible) goes vastly beyond the sign-behavior of animals ... (130)

And, continuing, he adds the following observation (this, too, would seem to be very close to Sebeok's conception of human signs):

But language-behavior is still sign-behavior, and language signs rest upon, *and never completely take the place of*, the simpler signs which they presuppose. The continuity is as real as the discontinuity, and the similarity of human and animal sign-behavior as genuine as the difference. (130, italics out own)

Having defined language in a vast semiotic perspective and not in reductive linguistic terms, and having distinguished between language and verbal language, and, furthermore, between language and communication, Morris goes on to consider *post-language symbols* (cf. 122-125). They are signs that presuppose language as primary modeling (in Sebeok's terminology). Having founded semiotics, or semiotic as Morris prefers, on the behavior of organisms, he states that there are *signals* and *symbols* which antedate language, and *language signals* which are not language symbols. Furthermore, he also identifies *post-language symbols* which are described as follows:

Symbols producible by their interpreters and synonymous with language signs (*lansigns*). Such symbols may be personal or interpersonal, and may or may not themselves become elements in a language (*lansign-system*). (365)

On the basis of the concept of *personal post-language symbols* Morris characterizes mental processes such as thoughts and ideas together with the concept of mind itself, in behaviorist terms.

Personal post-language symbols are substitute stimuli valid for a single person. They may be external or internal, that is, *exteroceptive stimuli* (the words pronounced by a person ‘silently to himself’ to remember what has been said to him), or *proprioceptive stimuli* (‘talking to oneself’).

Interpersonal post-language signs, on the contrary, are valid for more than one person and may become *comsigns* and perhaps even elements in a language. Culture is formed of interpersonal post-language systems.

Returning to personal *post-language symbols*, Morris points out that they make up thought and consequently may be considered as *the interiorization of external signs*. From this point of view, the difference between ‘talking out loud’ and ‘thinking to oneself’ is the difference between language signs and personal post-language symbols. On the basis of this distinction Morris proposes the following alternative relatively to use of the terms ‘mind’ or ‘mental’: we either consider all sign processes as ‘mental’ processes (which would seem to be Peirce’s position), or (similarly to Mead) we limit ‘mind’ to sign behavior where language signs or post-language symbols occur.

Language and writing

As stated, in Sebeok's view (*S/S*, 1, art. 18) language was exapted for communication ‘into speech, and later still, into other linear manifestations, such as script’ (443). We have proposed (Ponzio, Calefato, Petrilli 1999) a distinction between ‘script’ or ‘transcription’ and ‘writing’. In our opinion this distinction is as important as that between language and speech. We may use the term ‘writing’ for that characteristic of language understood as human modeling designated by Sebeok with the term ‘syntax’.

Without distinguishing between script and writing — writing *avant la lettre* — it is not possible to free the mind from the widespread prejudice that in today's society writing is overwhelmed by other sign forms. Part of this prejudice is the thesis that nowadays the image dominates over writing, as though all forms of human sign production were not as such forms of writing. The fact is that we have a restricted view of writing. Accordingly, *writing* is identified with the *transcription* of oral language, which it merely registers, appearing as a sort of outer covering, subaltern and ancillary with respect to orality.

Thus considered writing is no more than mnemotechny (as in Plato). Such a restricted view is not only connected to the preconceived idea of the primacy of the oral word, of the *phoné*, and therefore to a prejudicial phonocentric order. It is also connected to a prejudicial view of an ethnocentric order. According to this perspective, writing — reduced to the status of transcription — would wrongly seem to be the prerogative of certain social forms and not others. It is thought to represent a fundamental stage in human history, a discriminating factor between prehistory and history, between 'cold' societies devoid of history and 'warm' societies endowed with history, capable of evolution and historical memory.

Writing understood as transcription is connected to 'culture' in a narrow sense, according to which writing is opposed to 'non culture' and is thought to belong to the 'man of culture', with all the connections that writing thus described has with power and with the consolidation of relations of dominion of man over man. On the contrary, the capacity for writing as a species-specific capacity belongs to 'culture' in a broad sense, in an anthropological sense which opposes writing to 'nature', attributing it to man as such.

In reality, the invention of writing as transcription presupposes *writing* understood in a far more complex sense, and in a far broader temporal sphere than man's historical-cultural evolution, given that it concerns the very process of homination, that is, the formation and evolution of the human species. Writing is a human species-specific modeling device through which the human being, resorting to various means — including one's body or external physical means —, organizes experience as well as surrounding reality both spatially and temporally conferring sense upon them and constructing whole worlds. The human being is capable of inventing new senses and constructing different worlds with the same means and elements. All animal species construct their own worlds in which things take on a given sense; the distinctive feature of the human species lies in the capacity to confer different senses upon the same elements, even limited in number, and to construct a plurality of possible worlds.

Thus intended the capacity for writing, '*ante litteram*' writing, writing antecedent to the written sign, to transcription, represents a fundamental stage in the homination process antecedent to speech which is privileged with respect to other — even earlier — means of communication. Writing thus understood is not a means of communication like speaking and its transcription, but rather precedes and is the foundation of all forms of communication.

The development of speech and of relative verbal systems, that is, languages, presupposes writing. Without the capacity for writing man would not be in a position to articulate sounds and identify a limited number of distinctive features, phonemes, to be reproduced phonetically. Without the capacity for writing humans would not know how to assemble phonemes in different ways so as to form a great multiplicity of different words (monemes), nor would they know how to assemble words syntactically in different ways so as to form

utterances that are always different, expressing ever different meanings and senses.

And when, as in the case of deaf-mutes, the development of writing in the phonic form is impossible, writing — if adequately elicited — finds other possibilities of grafting (gesture, drawings) which (at times) allows for the noteworthy development of the language capacity unaccompanied by speech.

Today we are witnesses to a noteworthy development in languages which proliferate thanks to developments in technology as well as to encounters and exchanges among different cultures (closed frontiers and the assertion of community identity cannot obstacle such encounters and exchanges which obviously go far beyond market exchange). Nowadays writing understood in the broad sense described above has greater possibilities of manifesting itself in different ways. And thanks to language as described above, photography, cinema, television, videocassettes, computers represent new possibilities of writing increasing our capacity for the ‘play of musement’. Furthermore, traditional forms of expression such as theatre, music, the figurative arts may now resort to new developments in technology to invent new forms of writing within their own spheres as well as through processes of reciprocal contamination leading to the formation of new expressive genres. Picture writing, design, photographic writing, film writing, musical writing should now all be reconsidered in this light and viewed as representing high levels in the manifestation and development of the creative need of writing understood as the capacity for language.

There is no question of the crisis of writing. No other historical era has ever been so rich in writing as the present. *We are now living in the civilization of writing.* And this fact should be stated emphatically to anyone who, confounding writing and the written sign, writing and transcription, should complain —

through ignorance or for ideological reasons — about the ‘loss’ or ‘debasement’ of ‘writing’.

These days what we especially need is a commitment to achieving the right conditions for the spread and free growth of writing systems, delivering them from any form of subjection to whomever holds control over communication. This is the real problem for education in writing. It is not a question of falsely opposing ‘writing’ to the ‘image’ in current forms of communication, but of the objective contradiction between continuing increase and expansion of writing, languages, the free ‘play of musement’ and increasing control over communication, which is also increasing concentration of such control in the hand of a few.

Literary writing is another important place, and perhaps the earliest, where writing attains independence from transcription, that is, where the written sign attains independence from its ancillary function with respect to oral language, and therefore where writing is no longer reduced to mnemotechny. Today other forms of writing develop and supplement the work of literary writing.

Disengagement of literary writing, that is, disengagement with respect to the obligations characterizing other genres where writing figures as mere transcription, frees it from defined and circumscribed responsibilities, delimited by alibis. As writing and not as transcription, literary writing is refractory to any form of power that may obstacle it (see Orwell 1949). Such disengagement from (technical) partial and relative responsibility charges literary writing with the kind of (moral) responsibility that does not know limits (Bakhtin). This delivers man from all that which may obstacle the free manifestation of what characterizes him in his specificity as a human being: language, in other words, the possibility of the infinite play of constructing — and deconstructing — new possible worlds. The human lies in this nonfunctional, unproductive, freely

creative play of writing, independent of need, an excess in relation to functionality, productivity, external to the ‘reign of necessity’ (Marx).

Machine semiosis and verbal semiosis

In their discussion of machine semiosis (*S/S*, 1, Art. 26), the authors ask what roles machines can play in semiosis understood, according to the Peircean definition and to Art. 1 § 2 (*S/S*, 1: 2), as the relationship between interpretant, representamen and object. The question is precisely: we know machines can be objects of signs, but can they be representamens and interpretants? The authors start from the homological scheme of production proposed by Rossi-Landi (1975a, 1992a).

Recognizing humans as the concrete subjects of history, the responsible agents of culture and communicative systems, Rossi-Landi formulates the thesis of a *homology* between verbal and nonverbal communication. Linguistic work may be placed on the same level as work to produce physical objects because ‘if we do not want to admit that something *human* can exist for man without the intervention of man himself, we must adhere to the principle that every wealth or value, however understood, is the result of work which man has accomplished and can do again’ (1992b [1968], Eng. trans.: 35). Since human beings construct themselves historically through the production of tools and verbal messages, Rossi-Landi suggests we render the definition of human beings as speaking and working animals a unitary definition, and consider homologous these two modes of social behavior.

Rossi-Landi’s goal was to study the relation between material artifacts and verbal artifacts through a method of analysis referred to as the ‘homological

method'. This method does not consist in identifying immediate and superficial relations of resemblance, as in analogy, but in identifying homologies, that is, resemblances of a structural and genetic order among objects associated with different fields of knowledge and which at a superficial glance would seem to be separate. In spite of their different disciplinary provenance and the fact that they appear separate, material and linguistic artifacts may be considered as parts of the same totality because they are the result of human work. Therefore, the homological method has contributed to the critique of hypostatization of parts separated from the totality, to which instead they in fact belong. In so doing this method has also aided discussion about the need to transcend separatism in the sciences.

The homological element breaks with specialization: it obliges one to keep in mind different things at the same time, it disturbs the independent play of separate sub-totalities, and calls for a vaster totality, whose laws are not those of its parts. In other words, the homological method is an antiseparatist and reconstructive method, and, as such, unwelcomed by the specialists. (Rossi-Landi 1967-72, 16-17, 1985a: 53. On Rossi-Landi's homological method, see also Ponzio 1988)

It is obvious that Rossi-Landi's semiotic perspective is holistic or global.

As stated in Article 23, Rossi-Landi 'is probably the semiotician to have argued most vehemently in favor of a homology between tools and signs' (*S/S*, 1: 549). Through his analysis, it turns out that 'tools and machines are signifiers that signify their use' (549). In this sense we may claim that they play the role of representamens.

Rossi-Landi (1992a: 221ff) distinguishes between five main levels (in all there are ten levels of articulation; or, properly speaking, ‘parking lots’) in verbal production and material production. With reference to material production, the main levels (or ‘parking lots of artifacts’) are the following: (1) Matteremes (\approx phonemes); (2) Objectemes (\approx morphemes); (3) Utensils (\approx sentences); (4) Mechanisms (\approx syllogisms); (5) Automated machines.

In the article under discussion the fifth level is that concerned with machine semiosis. This is the level where artifacts may substitute the human worker in the working process partially or totally. There is no separate linguistic homology, since ‘at this level of automation, material and linguistic production are reunited’ (Rossi-Landi 1992a: 216).

Although the authors accept Rossi-Landi’s analysis of artifacts — machines and automated machines included — as signs, they make two critical observations on his homological scheme of human production. The first concerns the parallelism between matteremes and phonemes (cf. 549). The second relates to level 5 regarding which Rossi-Landi ‘is seriously mistaken’ (cf. 551), since this level does not form a continuation of the preceding levels, but represents a whole new ladder. With regard to the first point, unlike Rossi-Landi, the authors of the article in question aver that it is not possible to conclude that artifacts form a hierarchy or level similar to verbal signs.

This is an empirical question. ... Consider for example a pair of scissors. It can be returned into a knife by removing one of the legs, and turning the remaining eye into a handle. Neither qualifies as a mattereme, and in addition we had to make two changes, not one.

This case is probably typical for the simple reason that utensils are subject to more severe physical constraints than words when used to signify something. Words are arbitrary signs and can be constructed with little regard to the actual physical shape of their referent, whereas utensils must perform the operation they denote. ‘Horse’ and ‘*cheval*’ are equally

good for denoting the same animal, but neither Englishmen nor Frenchmen can use a rubber band as scissors. (549)

In truth Rossi-Landi was aware of such a difference between artifacts understood as utensils and machines, on the one hand, and verbal signs, on the other. The issue at stake is what we have called ‘extrasign instrumental materiality’ (see Ponzio 1990a, and Petrilli 1990a). This expression designates the kind of materiality thanks to which a sign carries out a nonsign function in addition to its sign function. As such extrasign instrumental materiality does not characterize verbal signs that, indeed, carry out none other but sign functions. On the contrary, it applies to nonverbal signs, such as utensils, tools, and machines.

One of the most important contributions to this notion was made as far back as the 1960-70s by Rossi-Landi himself (1992a, 1992b [1968], 1994 [1972]), with his concept of the ‘bodily residue of nonverbal messages’. This residue is evident when we apply the instruments of linguistic analysis to the study of nonlinguistic objects such as tools and machines and vice versa. With such a method, however, the risk of failing to distinguish between the production and consumption of objects and the production and consumption of signs must be avoided.

The ‘bodies’ of verbal signs have no other use beyond their sign function. On the contrary, a sign that does not arise expressly as a sign — a nonsign body invested with a sign function — may continue to serve an extrasign instrumental function even when the sign function no longer holds. Such bodies may either be natural, in the sense that they already exist in nature, or human artifacts produced expressly for other than sign functions.

If ‘the existence of matteremes seems rather dubious’ (as state the authors of Art. 26, *S/S*, 1: 549) given that so called matteremes may be used with a different function from that foreseen by the artifacts they belong to, this is a consequence of their extrasign instrumental materiality. The pivotal difference between verbal signs and nonverbal tools and machines is that ‘the tool and machine are signifiers that signify their use’ (549), so that unlike verbal signs, they may be used both as *signs and nonsigns*. Furthermore, nonsign use may be carried out by the whole artifact (for instance, a pair of scissors) as much as by any of its single parts (in this case one of the legs turned into a knife). On the contrary, the specific function of verbal signs (which are produced expressly for communicative and signifying purposes) reduces, though does not exclude, the independent use of acoustic material belonging to the first level of articulation.

Moreover, Rossi-Landi’s scheme concerning structural homology between material and linguistic production does not limit itself to simply using the linguistic notion of the double articulation of language, but, beyond this, throws light upon it. In fact, the passage described, for instance, by André Martinet (1960), from the articulation of sentences into words and monemes to the articulation of monemes into phonemes turns out to be oriented in the opposite direction from that in which the real process of linguistic production proceeds (cf. Rossi-Landi 1992a: 173-176). The linguistic work carried out by speakers — both phylogenetically and ontogenetically — proceeds from sounds that are at the beginning disarticulate, become more and more articulate until they are words, to the formulation of phrases and sentences of increasing complexity.

The linguistic doctrine of double articulation, assuming that language is a mere formal machine, neglects the facts of experience and the needs upon which linguistic behavior depends. It puts aside the problem of the formulation of meaning and of the use of sentences, limiting itself to describing their

constituent parts. Rossi-Landi observes that when we analyze or ‘order’ (as Martinet says) sentences into words and monemes and monemes into phonemes, we are not saying anything about the ‘semantic content’ which is ‘added’ at the level of sentences as opposed to the level of monemes and words, and at the level of monemes as opposed to that of phonemes. Nothing is said about the human operations through which the semantic content is formed. The work of analyzing sentences into words and monemes, and these into phonemes, is abstract-analytical work that has little to do with and must not be mistaken for the social linguistic work through which the objects studied by the linguist are formed. The homological scheme proposed by Rossi-Landi for verbal and nonverbal human production, unlike that offered by ‘double articulation’ theory, is potentially interdisciplinary because it is intentionally ‘predisciplinary’ (cf. Rossi-Landi 1992b [1968]: 177). This means putting already-formed science under discussion by referring to a precategory level, and criticizing scientific specialization insofar as it loses sight of the human needs for which it was originally developed.

With regard to the observation reported above concerning Rossi-Landi’s level 5 in his classification of artifacts, the Authors argue as follows:

... [L]evels 2-4 are replicated in computers: modern computer systems are normally built by means of software libraries (computerized objectemes), and encompass utensils as well as mechanisms.

... Although Rossi-Landi recognizes that the hierarchies of language and artifacts merge in automatic machines, he has not grasped the fundamental change, namely that software — sign complexes — now defines the ‘machine’ and that hardware — the physical machine — plays a subordinate role ... (551)

We agree with Andersen, Hasle and Brandt (authors of Art. 26) on the pivotal change provoked by the current revolution effected by the introduction of information technology, which we will deal with soon. However, we believe that their opinion about Rossi-Landi on this subject is contradicted by the latter's own theory of language as work and trade. Contrary to what is stated by the Authors, we have good grounds to believe that Rossi-Landi was ever more aware of technological qualitative changes, indeed, of a 'whole new ladder', to say it with the Authors. This clearly emerges, for example in the following statement by Rossi-Landi:

One can ascend along what I have called the homological scheme of production up to a certain point, where something incredible happens, that is, the two productions merge into each other. This has happened in recent decades: to produce a computer, hardware in technical language, that is a material body, the elaborate material of which computers are made, merges with software, that is a program or ensemble of logically expressible linguistic relations. Therefore, the non-linguistic, that is, the objectual, and the linguistic at an extremely high level of elaboration have merged into each other under our very eyes almost. (Rossi-Landi 1985b: 171, Eng. trans. our own)

Articulation and modeling

Before we deal with the second question asked in Article 26 (*S/S*, 1: 549) by Andersen, Hasle, and Brandt concerning machine semiosis, namely, 'can machines be interpretants?', we wish to dwell on the notion of articulation and

examine it in relation to another topical notion in semiotics, which we have already considered, that is, ‘modeling’.

In the entry ‘Articulation’ (by David Lidov), in *Encyclopedia of Semiotics* (41-44), we read:

The theory of articulation in linguistics is well developed but narrowly specialized. Its three most outstanding achievements are the concept of double articulation, distinctive-features theory, and descriptions of marking or markedness. In the absence of a more general theory, other branches of semiotics have borrowed these linguistic notions with only limited success. The possibility of articulation in any domain of signs depends on the physical characteristics of its medium and the biological characteristics of the perception and performance channels involved as well as the structural characteristics of semiotic practices. No area of study in semiotics is more promising with respect to the growth of testable knowledge and the opportunity for productive synthesis than the general study of articulation. (41)

Among the scholars mentioned in the entry ‘Articulation’ figure most obviously Martinet, Hockett, and Prieto (cf. 42).

In Article 25 of *Semiotik/Semiosis*, ‘Anthroposemiose’, articulation is regarded as a criterion to discriminate between nonhuman semiosis and human semiosis.

Dennoch fehlen in der Tierwelt verschiedene Kriterien, die für menschliche Zeichenprozesse charakteristisch sind, die sich wesentlich über die artikulierte Lautsprache abspielen und — gegenüber den Formen nonverbalen Verständigung (vgl. Hinde 1972) und den akustischen Verständigungsformen

bei verschiedenen Spezies — abgehoben sind. Diese Kriterien zu untersuchen und hinsichtlich ihrer Voraussetzungen und Konsequenzen darzustellen, ist eine grundlegende Aufgabe der Anthroposemiotik. (536)

In *Encyclopedia of Semiotics* the entry ‘Modeling’ is lacking. With regard to *Semiotik/Semiotics*, we have examined this notion as it is proposed in Sebeok’s article (18), ‘The evolution of semiosis’. Both handbooks deal with ‘modeling’ in pages dedicated to the Moscow-Tartu School (*S/S*, Art. 118, by Michel Fleischer, cf.: 2291ff; *ES*, entry ‘Moscow-Tartu School’, by Peter Grzybek, 422-425).

After the 1964 summer school, the notion of secondary modeling systems was generally accepted, and the term became a key concept of the Moscow-Tartu School. Defining sign systems such as literature, myth, theater, painting, and puppetry as secondary modeling systems implied natural language as a primary modeling system on the basis of or corresponding to which all secondary systems are constructed. (424)

The concepts of articulation and model are closely related, and we believe that these two very important semiotic concepts can enlighten one another.

In his homological scheme of production described in ‘Articulations in Verbal and Objectual Sign Systems’ (in Rossi-Landi 1992a: 189-232), Rossi-Landi describes ten levels in human production. They progress from the *zero level* of intact, unworked-upon nature, i.e., of material nonsound substance and material sound substance, to *the tenth level of global production*, i.e., of all objectual sign systems and all verbal sign systems of a productive unit.

First level, presignificant items: from the viewpoint of material production (M.P.), *matteremes*; from the viewpoint of verbal production (V.P.), *phonemes*.

Second level, irreducibly significant items: M.P., *objectemes* (lexobjectemes or morphobjectemes); V.P., *monemes* (lexemes or morphemes).

Third level, completed pieces: M.P., *finished pieces of utensils*; V.P., *word, syntagms, expressions, parts of speech, phrases*.

Fourth level, utensils and sentences: M.P., *simple utensils*; V.P., *simple sentences*.

Fifth level, aggregates of utensils: M.P., *compound utensils*; V.P., *compound sentences*.

Sixth level, mechanism: M.P., *machines of a simple type*; V.P., *sylogisms, organized groupings of interconnected sentences*.

Seventh level, complex and self-sufficient mechanisms: M.P., *self-sufficient mechanisms*; V.P., *lectures, speeches, essays, books*.

Eighth level, total mechanism or automation: M.P., *automated machines*; V.P., *subcodes and lexicons*.

Ninth level, nonreportable production: M.P., *special constructions, unique prototypes*; V.P., *'original' literary and scientific production*;

Tenth level, global production: M.P., *all objectual sign systems of a 'productive unit'*; V.P., *all verbal sign systems of a 'productive unity'* (cf. Rossi-Landi 1992a: 221).

Rossi-Landi also describes parking lots of material and verbal artifacts:

- parking lot of matteremes and phonemes;
- parking lot of objectemes and monemes;
- parking lot of utensils and sentences;
- parking lot of mechanisms and sylogisms;

—parking lot of automated machines and nonverbal and verbal program-bearing codes (cf. 223).

The pieces parked in these five levels, which involve qualitative leaps in the transition from one to the other, are used to build different constructions. As we see, the concept of modeling was developed by the Moscow-Tartu school of semiotics in the early 1960s (Lucid 1977; Rudy 1986) to indicate *natural verbal language (langue)* considered as a primary modeling system, while all other human cultural systems were described as secondary modeling systems. Sebeok extends the concept of modeling beyond the boundaries of human semiosis relating it to the concept of *Umwelt* as described by the biologist Jakob von Uexküll. Consequently, the notion of *Umwelt* is understood as a model of the external world, and has proven to be of vital importance for research in the various disciplines grouped together under the name of ‘biosemiotics’. Sebeok has demonstrated that the modeling capacity is observable in all life forms. His book of 2000, co-authored with Danesi, *The Forms of Meaning*, studies human modeling processes as distinct from other modeling processes present in the living universe, in particular the world of superior animals.

Working in a biosemiotic perspective Sebeok and Danesi search for a methodological structure, their modeling systems theory, for their concept of modeling. In the light of modeling systems theory interpreted in a semiotic key semiosis is defined as ‘the capacity of a species to produce and comprehend the specific types of models it requires for processing and codifying perceptual input in its own way’ (Sebeok and Danesi 2000: 5). Systems analysis is the applied study of modeling theory and distinguishes between three modeling systems: primary, secondary and tertiary.

The primary system is an innate modeling device present in all living species. On the basis of this innate simulatory modeling capacity, all species

simulate their own worlds in their own species-specific ways (cf. 44-45). As we have already mentioned, Sebeok calls the primary modeling system specific to humankind language, distinct from speech and antecedent to it. This primary modeling system is present in the mute hominid and acts as the starting point for a new course in evolution leading to the rise of *homo sapiens sapiens* (cf. *S/S*, Art. 18, §§ 5 and 6).

The secondary modeling system allows for modeling processes of both the indicational and extensional type. Indicational modeling may be traced in diverse species. On the contrary, extensional modeling is a uniquely human capacity. It presupposes language understood as the primary modeling system of the human species.

The tertiary modeling system is at the basis of symbolically structured and highly abstract modeling processes. Tertiary modeling systems are cultural modeling systems specific to the human species (Sebeok and Danesi 2000: 120-129).

Thus [thanks to language] is the human being able to fabricate tertiary modeling systems of the sort Bonner (1980: 186), for instance, calls ‘true culture’, requiring ‘a system of representing all the subtleties of language’ in contrast to ‘nonhuman culture’, and thereby produce what the Moscow-Tartu group has traditionally been calling a ‘secondary modeling system’. It is on this level, redefined now as tertiary, that nonverbal sign assemblages blend together in the most creative modeling that nature has thus far evolved. (Sebeok 1991a: 58)

A *model* is defined by Sebeok and Danesi 2000 as a *form*. The form is imagined (*mental form*), or made externally (*externalized form*), to stand for an

object, event, feeling, etc. (*referent*), or for a class of objects, events, feelings, etc. (*referential domain*) (cf. 2).

Externalized artificial forms (i.e. forms made intentionally by human beings to represent something) may be divided into four main types: *singularized*, *composite*, *cohesive*, *connective*. These different types of forms characterize human representation. The singularized form is that which in traditional semiotics is called sign, e.g., the English word ‘cat’ referred to the familiar domestic animal known by that name. The composite form corresponds to a descriptive text such as the following: ‘A popular household pet that is useful for killing mice and rats’. A cohesive form is that which serves to codify types of forms in some cohesive fashion, e.g., cat understood as a category for tiger, lion, jaguar, leopard, cheetah, etc. Finally, the connective form refers to that type of modeling strategy traditionally described as metaphorical. In fact metaphors involve linkage among different types of referents or referential domains, e.g., Marcel is a lion.

Sebeok and Danesi (2000) exemplify these four types of models or forms with reference to two types of puzzles — the toy house model made with a set of plastic building blocks and the jigsaw puzzle. In both cases analogies may be drawn with each of the four different types of modeling.

In the toy house model analogy *each piece* corresponds to a *singularized form* and therefore to a *sign*. The *complex of pieces* used to build a construction corresponds to the *composite form*, and, therefore, to a *text*. The same *building blocks used in different constructions* (not only a house but also a hut, a cabin) correspond to the *cohesive form*, and, therefore, to a *code*. Lastly, this same set of building blocks combined with a set of different kinds of building blocks (e.g. designed to construct model vehicles) to produce new models (e.g. a mobile

home, a house trailer, etc.) corresponds to the *connective form*, and, therefore, to the *metaphor*.

In the case of jigsaw puzzles the following parallels are established. The *single piece* of a puzzle corresponds to the *singularized form*, and, therefore, to the *sign*. The *picture* that results from assembling the pieces correspond to the *composite form*, and, therefore, to the *text*. *The jigsaw puzzle itself* as distinct from other games, for example, a chess game, corresponds to the *cohesive form*, and, therefore, to the *code*. Finally, *any linkage* made between the pieces of the jigsaw puzzle and those of a chess game correspond to the *connective form*, and, therefore, to the *metaphor*.

At this stage we must ask ourselves what makes such parallels possible between puzzles and models or forms. Sebeok and Danesi speak of analogy. From this point of view, we could maintain that the connection between puzzles and models or forms is a connective form, a metaphor. This statement is acceptable on the condition that the similarities or parallels identified between puzzles and models or forms are not merely considered to be subjective. In fact, puzzles and forms may be described as relating metaphorically, but not simply as an artifice of discourse functional to the exposition of our argument. On the contrary, the metaphorical relationship is an objective relationship of a genetic-structural order. In the language of biology the more precise term for similarities of this type is ‘homology’ rather than analogy. Puzzles and modeling forms relate to each other homologically.

Such homology may be explained in terms of the human species-specific modeling device, or language, as Sebeok also calls it, as distinct from speech. As mentioned, all nonhuman animals have construction models of the world. Language is humankind’s and has been since the appearance of hominids. Language as a modeling device is completely different from modeling devices in

all other animals, even though it shares the same types of signs (icons, indexes, symbols, etc.). The specific characteristic of language as a modeling device is articulation or syntax, as says Sebeok (cf. S/S: 443-444; see also Sebeok 1991a; 1994b). Thanks to syntax or 'writing' (as Ponzio, Calefato and Petrilli 1999 prefer), writing *avant la lettre*, it is possible to compose a finite number of elements or pieces in an indefinite number of different ways. Thanks to syntax or writing, the human modeling device or language can create an indefinite number of different forms, which can in turn be deconstructed to construct new forms with the same pieces. This means that by contrast with nonhuman animals, humans are capable of constructing an indefinite number of possible worlds.

Noam Chomsky describes creativity as a specific characteristic of verbal language (Sebeok's speech). On the contrary, creativity is a derivative in verbal language and, instead, a specific characteristic of language understood as syntax or writing, that is, the primary modeling process. For this reason a homological relationship, as anticipated, may be established between puzzles and the four types of modeling or forms identified by Sebeok and Danesi. Developing their argument, our claim is that human modeling functions on the basis of a combinatorics which is homologically similar to the construction of puzzles. However, the difference consists in the fact that in the case of puzzles the combinatorics proceeds according to a preestablished plan, in other words, the pieces of a jigsaw puzzle can only be assembled according to an original plan. On the contrary, the combinatorics involved in the form of a text, code and metaphor is characterized by the capacity for innovation and inventiveness and, therefore, by a propensity for creativity no doubt different from the purely reconstructive type used in jigsaw puzzles.

A comparison may be established between this type of puzzle and a text understood in a strict sense. The term strictly understood

becomes simply a collecting point for types of written materials that are formed primarily in alphabetic or quasi-alphabetic scripts or, by a kind of extension and license only, in pictographic scripts or in pictures, perhaps in music or musical notation, perhaps in mathematical or diagrammatic forms, and so on. ('Text', by Alec McHoul, *SE*: 610)

Comparing jigsaw puzzles and texts would not be a question of constructing a text but of reconstructing it, similarly to the work of a philologist who must restore a text which has undergone damage because of the climate or through voluntary external manipulations. Jigsaw puzzles may be compared to the reconstruction of the fragments of a broken vase. But even more than this, the creativity of human modeling is not only capable of restoring the smashed vase's form, but also of producing vases with completely different forms.

In any case, what makes puzzles similar (in a homological sense) to the forms of modeling is the fact that both are the expression of the same articulation device.

In their description of singularized forms, Sebeok and Danesi start from words, that is, from what the linguists call the first articulation, i.e., the level where a sentence (when a question of the verbal) is broken down into units endowed with meaning, i.e. 'words', or better, 'monemes'. Meaning is defined as a 'particular concept elicited by a specific representational form' (Sebeok and Danesi 2000: 195).

If, instead, when analyzing the verbal we also consider non signifying forms, we could include Martinet's second articulation which involves units

devoid of meaning, i.e. ‘phonemes’. In this sense we would be working at a primary level, the level of primary elements devoid of meaning. A finite number of pieces, or phonemes, which constitute the basic phonological repertoire of any given language, may be combined to compose a high number of signifying units or monemes representing the lexical and morphological patrimony of a language. A set number of monemes may be used to construct an indefinite number of sentences or texts.

Iconicity in articulation and modeling

As stated, Sebeok and Danesi’s connective form refers to that type of modeling strategy traditionally described as metaphorical. In the light of Peirce’s semiotics we know that metaphor is an iconic sign (*CP* 2.276-277). Precisely, it is an *iconic metasign* and, consequently, it presupposes articulation of the human modeling device, or language. We shall examine the relation between metaphor and articulation in verbal language, and between icon and modeling in general.

Traditional linguistics has always underestimated the importance of metaphor (Chomsky even considered the metaphor as an aberrant form). On the contrary, and in line instead with more recent developments in linguistics known as *cognitive linguistics*, Sebeok and Danesi (2000) invest the metaphor with a role corresponding to one of the four fundamental forms of human modeling. In the entry ‘Metaphor’, by Charles Forceville (*ES*: 411-414), George Lakoff and Mark Johnson’s *Metaphors We Live By* (1980) is mentioned as ‘the most influential book-length study on metaphor’.

Lakoff and Johnson argue that metaphors are a far more pervasive occurrence in everyday speech and writing than has been acknowledged hitherto. (412)

Before Ivor A. Richards (1936), most significant contributions to evidencing the role of metaphor in language and thought had already been made by Victoria Welby (who is nowhere even mentioned in *ES*) and Giovanni Vailati. In this sense another very important contributor was Vico as acknowledged in the entry ‘Vico, Giambattista’ (by Gustavo Guerra, *ES*: 627-629):

... ‘every metaphor is a fable in brief’ (1725, par. 404). By fable, Vico refers to the naming operation through which something unknown becomes known. Because that naming operation is based on similarities, Vico concludes that every act of interpretation is in fact a metaphor. And since to be known the world has to be interpreted, Vico concludes that the world does not exist until it becomes, in fact, a metaphoric creation. (628)

So Vico too believed that the metaphor is an original and fundamental structure in human thought, and not just a rhetorical device used for ornamentation, a mere characteristic of the stylistic type. From this point of view, Danesi 2000 establishes a very close connection between cognitive linguistics and the poetic logic of Giambattista Vico (on Vico in semiotics, see Sebeok 2001b: 135-144).

The four forms of human modeling or the four types of forms characterizing human representation correspond to just as many forms of articulation. As anticipated, a fifth form might be added, i.e. a more basic singularized form corresponding to the phoneme.

As we have said, Rossi-Landi also identifies four levels of articulation: these include phonemes and monemes and two higher level articulations, *syllogism* and the automated *programming* of linguistic performances (cf. 1992a: 189). The latter refers to verbal program-bearing codes. This fourth articulation corresponds in part to what Sebeok and Danesi call code in their typology of models or forms, with the difference that it also includes a form of behavior programming, in other words, an ideological component. Also, if Rossi-Landi's scheme proposes four articulations similarly to Sebeok and Danesi and their four types of forms, this is because Rossi-Landi includes what might be considered as a fifth articulation, i.e. phonemes. However, Rossi-Landi's scheme does not refer to the metaphor, or to what Sebeok and Danesi call the connective form, while instead a correspondence may be established between the syllogism foreseen in Rossi-Landi's scheme and the composite form or text in Sebeok and Danesi's typology. However, as we shall see below, the syllogism also shares in the characteristics of the cohesive form and the connective form. Furthermore, Rossi-Landi develops these four articulations across ten levels (see above).

This emerges if, following Rossi-Landi, we examine the homology between *material production* and *verbal production* (together with the homology between puzzles and forms exemplified in verbal modeling). Insofar as they are both manifestations of the same modeling device, of what Sebeok calls language, material production and verbal production are related homologically.

Even though more articulations are foreseen by Rossi-Landi's scheme than by model systems theory in the version proposed by Sebeok and Danesi, they may all be reconducted to the four forms described by the latter: i.e., the singularized form, composite form, cohesive form, and connective form. In fact, the connective form that allows escape from any one single code and connection among different codes, plays a fundamental role in human creativity. A parallel

has been established between codes and jigsaw puzzles: in codes the *ars combinatoria* is restricted to precise limits. On the contrary, in the connective form, which has been compared to any linkage made between the pieces of a jigsaw puzzle and those of another game such as chess, the *ars combinatoria* is let free: here the puzzle composition becomes a bricolage. The connective form corresponding to the metaphor emerges as the possibility of autonomization from code repetition and as a fundamental means of inventiveness and innovation.

The basic piece-concepts of modeling systems theory, as described by Sebeok and Danesi, are the four types of models or forms mentioned above: singularized form, composite form, cohesive form, and connective form. These are connected with four modeling strategies: singularized modeling, composite modeling, cohesive modeling, and connective modeling. Combined with the three human modeling systems described above — primary, secondary and tertiary — we obtain twelve types of modeling:

- 1) primary singularized modeling (nonverbal and verbal);
- 2) primary composite modeling (nonverbal and verbal);
- 3) primary cohesive modeling (nonverbal and verbal);
- 4) primary connective modeling;
- 5) secondary singularized modeling;
- 6) secondary composite modeling;
- 7) secondary cohesive modeling;
- 8) secondary connective modeling;
- 9) tertiary singularized modeling (verbal and nonverbal)
- 10) tertiary composite modeling (verbal and nonverbal);
- 11) tertiary cohesive modeling (intellective codes and social codes);
- 12) tertiary connective modeling.

As anticipated, a parallel may be established between Sebeok and Danesi's typology and Rossi-Landi's homological scheme of production. The latter identifies four articulations, which he develops across ten levels, similarly to Sebeok and Danesi's four types of forms that combined with the three human modeling systems produce twelve different types of modeling processes. Despite a difference of two, these two schemes represent two processes of complexification — the unit of a productive system, on the one hand, and the unit of a culture, on the other hand — which ultimately equal each other and as such are comparable in their overall development. The tertiary modeling system, i.e., that which subtends highly abstract symbolization processes, forms a unit or totality in the human cultural world (cf. Sebeok and Danesi 2000: 129).

This overall cultural and productive unit, which presents itself as a sort of jigsaw puzzle, is supported by a primary modeling system. The primary modeling system enables an organism in general to simulate its world species-specifically. Systems analysis studies primary modeling processes and their manifestations across species. A primary modeling system is the innate ability to model the sensible properties of things and is at the basis of forms or models produced by simulating some sensory property of a referent or referential domain. In the sphere of anthroposemiosis primary simulation modeling is manifested in singularized (e.g., the thumb and index joined to represent a circular object), composite (e.g., scenes reproduced in a painting), cohesive (e.g., certain bodily features simulated in erotic dancing), and connective (e.g., a *metaform*, — i.e. a concept that results from the linkage of an abstract notion with a concrete source domain, as in 'love + a sweet taste' — used in discourse situations) modeling phenomena.

Two distinct kinds of primary modeling processes can be traced within the sphere of biosemiosis: *osmosis* and *mimesis* (cf. Sebeok and Danesi 2000: 45).

Osmosis refers to natural, unintentional, spontaneous forms of simulation in response to a stimulus or need; mimesis refers to intentional and deliberate forms of simulation. These two different types of primary modeling processes together form the *gigantic jigsaw puzzle* that is our biosphere and which includes another *big jigsaw puzzle* (though doubtlessly smaller with respect to the first), the human cultural world.

This implies the presence of *iconicity*, defined by Sebeok and Danesi as the process of representing referents in iconic forms, i.e. in singularized forms, throughout the whole biosphere (see the excellent entries ‘Icon’ and ‘Iconicity’, by Göran Sonesson, *ES*: 293-294, 294-297). Articulation, which is specific to human modeling, is also based on iconicity. In other words, the a priori icon is the presupposition of Modeling Systems Theory. This theory acknowledges *primary iconism* (cf. Eco 1997) as an agent in modeling phenomena in anthroposemiosis as well as across species. *En passant*, perhaps it is not useless to remember that ‘iconic’ does not imply ‘visual’: there are signs that are conveyed visually without being iconic as well as iconic signs that are non visual. In the first case we have ‘aniconic visual signs’ (see the relative entry by Carl G. Liungman and Göran Sonesson, *ES*: 26-27). The concept of *aniconicity* was first introduced by Sebeok (1979: 107-127).

That the icon with respect to articulation in the human world is primary, and therefore a sort of a priori, is demonstrated in Sebeok and Danesi (2000: 44-81) by the fact that a primary model is a *simulacrum* of a referent. Consequently, a primary *singularized model*, i.e., a singularized simulative form, is an *icon*. Moreover, primary *composite modeling* is a representational strategy through which various *iconic signifiers* are combined to encode complex (non unitary) referents. Primary *cohesive modeling* is also a modeling code involving particular types of *iconic signifiers* serving various simulative representational

purposes. Lastly, primary *connective modeling* is based on the *metaform* (Sebeok, Danesi 2000: 71-76 and 113-114) which results from the linkage by similarity (*iconicity*) of abstract referents with concrete source domains, i.e., a set of vehicles (concrete forms) used to deliver the meaning of an abstract form.

Machines as interpretants

Let us now return to Rossi-Landi's level 5, the automated machine, and in particular to computer systems. The second question, mentioned above, asked in Article 26 (cf. *S/S*, 1: 549, 552) by Andersen, Hasle, and Brandt about machine semiosis is the following: 'Should we place machines in the interpreter role?'. The Authors's answer is affirmative. This confirms the spontaneous interpretation made in colloquial speech by those who use computers when they anthropomorphize their machine using words like 'ask', 'answer', 'comment', 'know', 'want'. Obviously, this is purely incidental since scientific statements frequently deviate from colloquial speech and spontaneous interpretations. We may say scientifically, on the basis of two characteristics of computer-based signs, that '*semiotic machines*', as computer systems may truly be called, carry out an interpreter role (cf. 552), namely *semiosis takes place inside their system*. These two characteristics are the following:

i. *Computer-based signs* have a larger iconic range than other signs. Neither the film nor video medium create icons of us interacting with other minds or bodies. On the contrary, this is precisely what computer-based signs can do:

[T]heir increased iconic range consists in providing icons of our interactions with our environment. Artificial intelligence ... creates icons of our interactions

with our minds, whereas virtual reality takes care of our interaction with three-dimensional space. (555).

ii. Computer-based signs can create some of their physical referents.

Although normal signs can create social referents (a marriage, an appointment, an academic degree), they certainly cannot create physical referents. Uttering the word *cake* does not produce a strawberry pie. But in an increasing number of cases computer-based signs can do exactly this. It is for example possible to draw a physical object in a CAD-program, push a button, wait a few minutes, and then have a metal or plastic replica in one's hand. (555)

Finally, the Authors deal with the question of whether it is possible to characterize machine-semiosis of semiotic-machines, i.e., of computer-based signs in opposition to human semiosis. Their reply is negative and is consistent with research on autopoietic systems carried out by the two Chilean biologists, Humberto R. Maturana and Francisco J. Varela (cf. 1980) and their followers, who submit that exactly the same situation obtains in biological organism. We have already had occasion to mention the *autopoiesis* theory with regard to the relationship between modeling and dialogue.

The term autopoiesis was applied to semiosis in 1973 (in a paper entitled 'Autopoiesis and the organization of the living') by Maturana and Varela (now in 1980) to name the capacity for self-producing organization unique to living beings. According to this theory, living systems have a self-reproducing or autopoietic organization: this consists of a network of processes that simultaneously produce and realize that same network as a unity (see also the entry 'Artificial life', by Brian L. Keeley, *ES*: 48-51).

The autopoietic organization is defined as a unity by a network of production of components which (i) participate recursively in the same network of productions of components which produced these components, and (ii) participate recursively in the same network of productions as a unity in the space in which the components exist. (Varela, Maturana, and Uribe 1974: 188)

The theory of autopoietic systems arises from the classical idea of *homeostasis*, but, as we read in the entry ‘Autopoiesis’ (by Evan Thompson, *ES*: 53-55), extends the latter in two significant directions:

First, it makes every reference to homeostasis internal to the very system itself through the mutual interconnection of processes; second, it posits this mutual interconnection as the very source of the system’s identity or, in biological terms, of its individuality. (54)

In the light of this theory, according to the Authors of Article 26 (*S/S*, 1: 569), a tentative conclusion of the discussion on the possibility of discriminating between semiotic machines and human semiosis could run as follows:

[T]he difference between human and machine semiosis may not reside in the particular nature of any one of them. Rather, it may consist in the condition that machine semiosis presupposes human semiosis and the genesis of the former can be explained by the latter.

Machine semiosis and human work

Let us comment the interpretation formulated in this article on the relation between ‘semiotic machine’ and ‘computer-based signs’, or, as we prefer, ‘sign machine’, on the one hand, and human semiosis, on the other, whose specific characteristic, as we have seen, is language, or in Rossi-Landi’s terminology, ‘linguistic work’.

Subordination of work to the machine is connected with the development of signs (a development discernible in the growth or proliferation of knowledge, competencies, specializations, and sciences). A specific form of subordination is that of linguistic work to the *sign-machine*. In the present age the relation between these two poles is becoming ever more a relation of identification rather than of homology. Production and communication can no longer be separated and the relation with machines coincides with the relation with signs, verbal and nonverbal. Nor is this simply a case of commodities that are messages and messages that are commodities.

If we follow a suggestion made by Rossi-Landi and shift from the level of the market to that of linguistic and, more generally, sign production, we soon realize that not only does automation concern the system of machines but also the system of languages. Reference here is both to language in general and to historical-natural languages, as much as these two different forms of language cannot operate separately from each other. Human work in the communication-production processes of automation developed to the level of the semiotic machine, is linguistic work. We have stated that there exists a homology between work in the ordinary sense and its products, on the one hand, and linguistic work and its products, on the other (cf. Rossi-Landi 1975a, 1985a, 1992a, 1994 [1972]). These two faces of the same human capacity for work are united in the semiotic machine and this is visible in the relation of inseparability

between computer software and computer hardware. Let us remember that when we speak about *linguistic* work, we are referring to language, a specifically human semiotic capacity. Language is a modeling device structural to human beings (cf. Sebeok, 'The evolution of semiosis', *S/S*, 1: 443-444).

Such considerations must be related to the condition of world or global communication. As indicated by the unity between computer software and hardware, the expression 'global communication-production' — beyond referring to the world-wide extension of the communication phenomenon, that is, its extension over the whole planet — indicates a social system characterized by a new phase in production where machines and signs mutually integrate each other.

In the current phase in capitalistic production, the machine can now replace intellectual work. This obviously means that automation has reached extremely high levels. In other words, automation presents itself in the form of communication and, therefore, the machine too functions as a sign.

This situation may be analyzed from two interconnected viewpoints: the economic and the semiotic. In both cases, however, we are dealing with a new event. Regarding its economic aspect, communication is no longer limited to the intermediary phase in the production cycle (exchange) as it had been in former phases in the development of the capitalistic system. Communication now identifies with production in the sense that the productive process itself takes the form of a communicative process. Furthermore, the third phase in the productive cycle (consumption) also takes the form of communication. Consumption today is above all consumption of communication.

Under the semiotic aspect, the development of automation (even in operations which had previously been reserved to intervention by human intelligence) means that communication extends to the field of the artifact,

therefore to the field of the artificial and inorganic. This state of affairs does not at all question the relation of identification between semiosis and life. Indeed, even though communication is now possible in machines, machines continue to be part of the organic world in the sense that they presuppose biosemiosis, indeed, even more specifically anthroposemiosis. The fact is that machines presuppose a certain level in historico-social development in anthroposemiosis, this sphere being the only context where machines function as signs. And just this, as clarify the Authors of Article 26, fixes the difference between human semiosis and machine semiosis (cf. *S/S*, 1: 569).

In any case, automatic development of the machine in terms of ‘artificial intelligence’ (see the relative entry, by Markus Peschl, *ES*: 44-46) marks the advent of something new in the field of semiosis over the planet Earth. The Authors of the article entitled ‘Machine semiosis’ are right when they claim that the level of the semiotic machine represents a whole new ladder with respect to preceding levels (cf. 551). In the case of traditional automatic machines (i.e., machines that are mechanical and able to replace physical force), machines have always communicated with each other, whether internally or externally with respect to a single piece of machinery. But high levels of development in automation today have made it possible to achieve far more than just a mechanical type of communication relation. It is now possible to achieve in machines as well that type of semiosis we call language, and which has so far been described as a species-specific characteristic pertaining to humans.

A machine capable of semiotics

On the basis of these remarks, the Authors's expression 'semiotic machine' becomes particularly meaningful. From a semiotic point of view, all this may be expressed with the statement that the machine which can replace human intelligence is not only capable of *semiosis* but also of *semiotics*. In this context, by 'semiotics', as stated above, is understood a metasemiotic process, that is, a process capable of interpreting other semiotic processes, therefore of metacommunication. Understood in this way semiotics is a specific characteristic of human beings. And if we understand language in terms of such a capacity, we may claim that language, or semiotics, is only possible within the field of anthroposemiosis. Therefore, the automatic machine able to replace intellectual work is a machine capable of semiotics — a machine endowed with language.

If we consider things from this perspective, we soon realize that whenever we are dealing with this kind of automation, it is not merely a question of extending semiosis. In reality, semiotics is extended to the inorganic order. Surprisingly enough, then, what is not possible in any instance of zoosemiosis other than in anthroposemiosis, can instead be achieved in the inorganic world. And this limitation on zoosemiosis holds true as much as communication is present throughout the entire organic world, indeed is the criterial feature of life itself. Unlike every other form of organic life beyond the unique exception of human life, the inorganic may be communicative at the highest levels of metasemiosis. This is the most innovative aspect of sign-machines that puts us in a position to speak of revolution: the inorganic becomes communicative and, furthermore, not only in terms of semiosis but also of metasemiosis. Consequently, we could make the claim that the machine endowed with language is the only case of a communicative non-organism, even more than this it is the only non-organism that is not only semiosically but also semiotically

communicative. If we consider the biosphere in its entirety, we soon realize that not only are human beings endowed with metasemiotics but also the machines produced today by humans.

Human-machine interactivity

It certainly might seem, especially at a superficial glance, that the extremes reached by machine automation thanks to astonishing innovations in artificial intelligence complete the process of humanity's subjection to the machine, so that machines lose their instrumental character and humans their agency. Upon a closer look, however, it becomes obvious that at high degrees of automation this process is inverted. Humans become active subjects once again as they relate to machines that are progressively more intelligent. As they interact with such machines, humans in fact recover their function as an indispensable component in the work process: neither humans nor machines are passive tools, but rather they are interactive participants in a complex exchange (see in *S/S 1*, above-mentioned Art. 14, 'Technische Medien der Semiose'). *Interactivity* would seem an apt term to name this relation of exchange. Furthermore, continuous technological development in artificial intelligence makes it necessary for people working with such high-powered automatic machines to acquire new competencies always. The acquisition of such competencies not only involves quantitative increase but also qualitative transformation.

From a technological perspective, there is no doubt that the intelligent machine requires a continuously updated active response from human beings if we are to be equal to the new tasks and potential put to us by progress. With earlier forms of automation, most typically represented by the assembly line

(think of Charlie Chaplin's comico-ironical performance in *Modern Times*), human intelligence was mortified by the machine's capacity for efficiency. On the contrary, human intelligence today is continuously elicited and challenged for services which are not repetitive but require re-elaboration, redefinition and renewal of one's intellectual and practical competencies. Unlike the kind of machine not endowed with language, intelligent machines elicit interactivity: active, variable response, innovation, updating, permanent training are all necessary and inevitable even for the sake of mere implementation. The decisive point here is that users and not only inventors are active. Furthermore, the interactive relation not only concerns the relation between user and machine, but also between one user and another. The work process develops through mutual participation, reciprocal assistance, mutual exchange of information, data, etc. The functional scheme is neither linear nor circular. The figure that best portrays this new condition is no doubt a grid. Intelligent machines require interactions that develop in networks and, in turn, networks that elicit interactions.

On the subject of the individual's active role in today's social system, Terry Threadgold's observations *à propos* contributions from the social sciences to semiotics in her article 'Social media of semiosis' (Art. 15, *S/S*, 1: 400) are enlightening:

What social labour has asunder is now weaving back together again. It is perhaps interesting just to recall here that all of this also encompasses another significant rewriting, the re-alignment of social and the individual with quite different collocational sets and values. In de Saussure's early formulation, the social was located in the system, the individual outside it. Now, individual action, dialogism, heteroglossia, conflict, institution and society, all those individual and specific things which de Saussure's system excluded, are actually

defined as the social, as what constitutes the social and constructs the systematics. The social and the individual are seen as mutually constructive and as constructive of the systems in terms of which they are understood.

Threadgold clarifies that interaction between the individual and the social should not be understood in terms of opening to alterity, to the outside. In this case, too, what we have is an autopoietic system.

There is no longer any inside and outside, only a constant dialectic between individual and social. The dynamic excluded other (the individual) has become the social and the system, and the static, synoptic, social system has now to be accounted for within the terms of that dynamic, as sets of products, codes, whose processes of production have been forgotten, and which maintain only a use-value within this dynamic economy. (400)

The new type of work that the intelligent machine requires from human beings is assimilated to abstract work, to work in general or indifferent work. Such assimilation is the condition of possibility for the evaluation of work in today's society. In other words, work associated with intelligent machines is quantified according to parameters established by the purchase and sale of work in capitalistic society, therefore it is measured in hours.

But the type of work required by the intelligent machine involves specifically human qualities, most notably the capacity for language, semiotic sign behavior, complex inferential processes capable of innovation and inventiveness. As such this type of work resists standard measurement as employed in today's society: that is, measurement in terms of work time. The type of human work we are describing has proven to be incommensurable and

unquantifiable. Human work manifests itself here in its constitutive incommensurability, in its essentially qualitative character with respect to which quantity plays a subordinate role; in fact, quantity cannot be the true criterion or norm to account for human work.

In spite of its incommensurability as the source of all historico-social value, human work has been assimilated to quantified abstract work measured in hours. As such it has been reduced to the status of commodities which is the condition for the very constitution of capitalistic society. This same operation has no doubt already been applied to linguistic work as well, to the point that we may speak of ‘linguistic alienation’ (cf. Rossi-Landi 1992a, 1992b [1968]). However, never before has capitalistic profit depended so heavily on the reduction of linguistic work to the status of commodities, as in the current phase in capitalistic production (which may be described as ‘communication-production’: see Ponzio 1999, Ponzio and Petrilli 2000). It is paradigmatic that, as Authors of article (26) ‘Machine semiosis’ (cf. *SS* 1: 551) note, software (sign complexes) now defines the ‘machine’ and hardware (the physical machine) plays a subordinate role. As the Authors say, this fact represents a fundamental change in the human production of artifacts. Such expressions as ‘immaterial investment’ or ‘appreciation of human resources’ or ‘human capital’ are symptomatic of today’s subordination of production to linguistic work. However, they also refer at once to the employment of linguistic work, therefore of intelligence, the mind, the human brain as unavoidable resources in the present day and age for the development of companies and their competitiveness.

All this signifies that in today’s world the human individual is distinguished by the capacity for metasemiosis, i.e., for language, the source of value, while work, however, remains in the status of commodities and is valued in terms of commodities. Consequently, never before has there emerged in human work so

sharp a contrast between its inherent capacity to increase its value and its status as a commodity. While it is manifest that *human* work as such is incommensurable, today more than ever it is treated as just another piece of merchandise. The contradiction between linguistic work and the work market is intensified in a manner similar to the contradiction between the inherent unquantifiability of human work and the systematic demand to commodify (thus, to quantify) the worker's economic contribution to capitalist production. Such a contradiction in this specific system exalts the quality of work in the form of linguistic work to a maximum degree and may be considered as being new, indeed specific to communication-production. This new contradiction between linguistic work and the work market ensues from the relationship between work in the contemporary world and semiotic machines.

Syntactics, semantics, and pragmatics

In *Semiotik/Semiotics*, Chapter II, 'Systematik' (soon after Posner's presentation), deals with the tripartition of semiotics into the three branches of *syntactics*, *semantics* and *pragmatics* (Articles 2-4, respectively by Posner, Klaus Robering, and again Posner, *S/S*, 1: 246). We prefer considering this topic only now so as to avail ourselves of what we have said so far on this subject, which would otherwise occupy much more space.

It was Charles Morris (1938b) who introduced this tripartition into semiotics, but the historical origins of these branches can be traced back to the *artes dicendi*, i.e., grammar, rhetoric, and dialectic, taught as part of the so-called *trivium* in Medieval European schools. This topic is considered in Chapter VIII on the history of Western semiotics in the Middle Ages, by Articles 52

(Stephen F. Brown, ‘Sign conceptions in logic in the Latin Middle Ages’, 1036-1046) and 53 (Markus H. Wörner, ‘Zeichenkonzeptionen in der Grammatik, Rhetorik und Poetik des lateinischen Mittelalters’ [Sign conceptions in grammar, rhetoric, and poetics in the Latin Middle Ages], 1046-1060).

Morris’s trichotomy is related to Peirce’s, who distinguished between speculative grammar, critical logic — the successor of dialectic — and methodeutic — the successor of rhetoric (cf. *CP* 1.191ff and 2.93). Thus Peirce reinterpreted the *artes dicendi* as branches of semiotics and systematized these as disciplines that treat signs as Firstness, Secondness, and Thirdness, respectively (cf. *S/S*, 1: 4). In this sense, semiotics consists of three subdisciplines: ‘speculative grammar’, which gives us a physiognomy of forms, a classification of the function and form of all signs; ‘critic’, the study of the classification and validity of arguments (divided into three parts: the logic of abduction, induction and deduction); and ‘methodeutic’, the study of methods for attaining truth. Pragmatism, which is based on the thesis that the meaning of a sign can be explicated by considering its practical consequences as the response of an interpretant, is a methodeutic theory in Peirce’s sense (cf. Article 100, ‘Peirce and his followers’, *S/S*, 2: 2020).

As Posner notes (cf. 4), although Morris’s trichotomy is related to Peirce’s, it is also motivated by reference to three leading philosophical movements of his time, Logical Positivism or Logical Empiricism (see Art. 106, ‘Der logic Empirismus’, by Rainer Hegselmann, *S/S*, 2: 2146-2161), Empiricism, and Pragmatism. Logical Positivism studies the formal structure of the language of the sciences (Carnap’s logical syntax), Empiricism studies the objects of research and their relations to the language of the sciences, and Pragmatism studies the procedures and conventions governing communication among

scientists. Thus, in Morris's view, syntactics could employ the methods and results of Logical Positivism, while semantics and pragmatics those of Empiricism and Pragmatism, respectively. On the whole, Morris's trichotomy is fundamentally the result of two main influences: logico-empiricism and behaviorism, on the one hand, and the pragmatic philosophy of Mead and Peirce, on the other (cf. Morris 1970).

In Morris 1938b, the three branches of semiotic, syntactics, semantics, and pragmatics, correspond respectively to the three *dimensions of semiosis*, the syntactical, the semantical and the pragmatival (on the relation between the branches — of semiotic — and the dimensions — of semiosis — see Article 113, 'Morris, seine Vorgänger und Nachfolger', *S/S*, 1: 2208). Distinguishing between semiotic and semiosis in *Foundations* Morris states that, 'semiotic as a science makes use of special signs to state facts about signs; it is a language to talk about signs' (Morris 1971: 23). And indeed one of the primary tasks he set himself was to establish a sign system to talk about signs. So the science of signs with its three branches, semantics, syntactics and pragmatics, focuses on semiosis and its three dimensions, the semantical, syntactical and pragmatival.

Morris already knew it was important not to separate pragmatics from semiotics, nor therefore the pragmatival dimension of semiosis from the syntactical and semantical dimensions. However, as opportunely noted by Posner, this does not justify speaking of 'Morris's pragmatically unified semiotics', nor stating that semiotics and pragmatics identify with each other.

According to a tradition that goes back to Michel Bréal's *sémantique* (1897) understood as 'the science of significations', meaning is generally associated with the semantical dimension of semiosis. On the contrary, however, meaning is present in all three dimensions including the syntactical and pragmatival and to state that it belongs uniquely to the semantical is the result of

a misunderstanding. When Morris claims that syntactics deals with relations among signs, this does not exclude that it involves meaning, which too is part of the relation among signs. Similarly, as much as pragmatics focuses on the relation of signs to interpreters, as says Morris, it too deals with signs and therefore with meanings (cf. Rossi-Landi 1994 [1972] which includes his paper of 1967, ‘Sul modo in cui è stata fraintesa la semiotica estetica di Charles Morris’). That Morris also focused on the semantical dimension of semiosis distinguished his own approach both from Carnap’s (1934) syntacticism as well as from the structuralist Leonard Bloomfield’s version of behaviorism (1933). The latter, in his effort to avoid ‘mentalism’ and to keep faith to the behavioristic approach to language, was rather skeptical of semantics. The unfortunate consequence of Bloomfield’s approach was that semantic issues were long neglected by American structuralists (see entry ‘Structuralism’, *ES*: 598-601).

The sign-vehicle, i.e., the object that functions as a sign, relates to a designatum and eventually a denotatum. This relation concerns the semantical dimension of semiosis. However, the sign is also the relation to an interpreter, which in response to the sign produces an interpretant. This is the pragmatical dimension of semiosis. Moreover, the sign must necessarily relate to other sign-vehicles, this being the syntactical dimension of semiosis. The sign involves all three dimensions of semiosis always. And, indeed, only for the sake of analysis is it possible to distinguish between the relation of the sign-vehicle to the designatum (and eventually the denotatum), the relation of the sign-vehicle to other sign-vehicles, and the relation of the sign-vehicle to the interpreter which is such only if endowed with an interpretant. According to Morris’s formulation of 1946 (1971: 365ff), pragmatics studies the effects of signs; semantics studies the significations of signs; syntactics studies the way in which signs are combined to form compound signs.

To restrict meaning to the semantical dimension of semiosis instead of tracing it throughout all three dimensions is to reduce the sign totality to one of its parts only, in the case of semantics to the relation of designation and denotation. Similarly, the relation of the sign to other signs does not only concern the syntactical dimension in a strict sense to the exclusion of the pragmatic and the semantical. Just as the relation of the interpreter to other interpreters does not uniquely concern the pragmatic dimension to the exclusion of the syntactical and the semantical. Each time there is semiosis and, therefore, a sign, all three dimensions are involved and are the object of semiotics.

Syntactics and syntax

Above-mentioned Article 2, 'Syntactics', by Posner (*S/S*, 1: 14ff), deals with signifiers, i. e. Morris's 'sign vehicles'. It covers the syntactical aspects of signs, their formal aspects, relations and combinations, including texts, pieces of music, pictures, industrial artifacts, and so on. As specified in this article and in accord with our observations anticipated above in our discussion on 'syntax' (in Sebeok's sense), in linguistics, phonology, syntax (in the strict sense) and the morphology of natural language all fall under *syntactics*. Syntactics includes morphology as well as syntax. With regard to the difference in this sense between syntactics and syntax, Posner observes:

In many contexts, the Carnapian identification of syntactics with syntax (cf. Carnap 1934 and 1939) is highly misleading. Only in sign systems which do not require a distinction between morphology and syntax is it unproblematic to

equate syntactics with syntax. This is the case in sign systems such as numerals and in most of formal languages constructed in logic so far.

Posner distinguishes between three aspects of syntactics which are indeed all present in Morris 1938b (in Morris 1971: 13ff, 23ff, 28f respectively): syntactics₁ the study of formal aspects of signs; syntactics₂, the study of relations of signs; syntactics₃, the study of how signs of various classes are combined to form complex signs (cf. *S/S*, 1: 14).

Syntactics₁ studies sign forms (see *ES*, ‘Distinctive features’, 199-201; ‘Markedness’, 385-387; ‘Pertinences’, 479-481, all three by Peter Groves; and ‘Phoneme’, by Paul Buissac, 481-482). For example: in phonology, syntactics₁ includes phonemes, but excludes physical phonetics; in musicology it includes tonemics, rhythmemics and dynamemics, but excludes physical acoustics (cf. *S/S*, 1: 15-21); in machine semiotics, we might add, it includes matteremes, objectemes, utensils, mechanisms and automated machines (cf. 549), but excludes ‘nonsign bodily residues’ (see above).

Syntactics₂ (as syntagmatics) studies *syntagmatic relations* among signs, i.e., relations occurring within an actually produced sign complex; furthermore (as paradigmatics) it also studies *paradigmatic relations*, i.e., relations among signs in a sign system, comparing given sign forms with virtual ones (cf. 17-21).

Syntactics₃ is the study of combination rules to form complex signs. A branch of syntactics is the study of combination rules in a sign system called ‘string code’. The latter includes, among other natural languages, writing systems, vestmental codes, culinary codes, and traffic signs (cf. 23). An example of syntactics₃, says Posner, is Chomsky's transformational grammar which studies rules of transformation from ‘deep structures’ to ‘surface structures’ (cf. 33-37).

This distinction (introduced in Chomsky 1965), as well as the previous between ‘nuclear’ and ‘non-nuclear sentences’ (Chomsky 1957), is connected with a very questionable conception of language and knowledge and with an equally questionable method of analysis (cf. Ponzio 1973, amplified French. ed. 1992b; 1997b: 313-320; 2001). In a context such as that offered by the *Semiotik/Semiotics Handbook*, it would not have been out of place to signal some narrow ideas in Chomsky’s linguistics. Apart from previous criticism, his limits in linguistics quite inevitably emerge in the light of a Peircean and Morrisian approach to the study of signs.

Chomsky's theoretical framework is lacking in those methodological features characteristic of a scientific sign theory enumerated in articles on semiotic method (see above). Chomsky sees no alternative to vulgar linguistic behaviorism (such as Skinner's), other than appealing to the rationalistic philosophy of the seventeenth century, and taking sides with mentalism and innatism. That the Chomskyan conception of language remains tied to the classical alternatives between consciousness and experience, rationalism and empiricism is not without negative consequences for a theory of language, even with respect to such a specialized branch as syntax. In this sense Chomsky's approach is alien to both Kantian criticism and along the same lines, to the conceptions of Edmund Husserl, Peirce, Ernst Cassirer, Maurice Merleau-Ponty, Morris, etc. (see § 2, ‘Kants Lehre vom Zeichen’, 1430-1431, in above-mentioned Chapter X, in *S/S*, 2).

Unlike Chomsky’s dichotomy between linguistic competence and experience, in modern conceptions after Kant experience is described as a series of interpretive operations. These include inferential processes of the abductive type (Peirce) through which the subject completes, organizes, and associates data which are always more or less fragmentary, partial, and discrete.

Experience is these operations as such is innovative and qualitatively superior by comparison with the limited nature of eventual input. After all, experience coincides with competence. What Chomsky (1986) baptized ‘Plato’s problem’ is a consequence of the false dichotomy between competence and experience as well as of the ensuing conception of experience as a passive state of the subject.

Morris’s concept of syntactics as well as the notion of syntax which belongs to it are connected with semantics and pragmatics. Instead, Chomsky’s syntax — as well as his phonology and semantics (morphology) — belongs to syntactics equated with syntax, as in Carnap, and separated from semantics and pragmatics.

Moreover, Chomsky confuses levels of analysis, mistaking the description of the objects of analysis for the construction of the models of analysis. In this sense, Chomsky’s linguistics is a unigradual linguistic theory which, unlike Rossi-Land’s (1998 [1961]) ‘methodics of common speech’ (see Ponzio 1988 and 1990a) or Shaumyan’s (1970 [1965]) bigradual theory of generative grammar, fails to distinguish between the genotypical level and the phenotypical level. This is a serious limit in the hypothetical-deductive method, or more properly, recalling the Peircean concept of ‘abduction’, in the abductive method.

Chomsky’s error is no different from that of Oxonian analytical philosophy, which claimed to describe ordinary, daily, or colloquial language in general while, in reality, describing the characteristics of a given natural language. Such confusion between two levels, the general and abstract level of language and the particular and concrete level of a given language at a given moment in its historical development, is recurrent — and not only in the Oxonian conception or in more recent analyses of language inspired by the latter. Chomskyan generative grammar, too, mistakes the specific characteristics

of a language — yet again English — for the universal structures of human language. The untranslatability of sentences used by Chomsky as examples of his analyses is symptomatic of the problem at hand. The transformational model proposed by Chomsky confuses elements which in fact belong to two different degrees of abstraction, ideal language and natural language.

Thus Chomskyan grammar with its methodologic suppositions and dualism between competence and experience and between deep structures and surface structures, would not seem to offer a suitable example of syntactics₃ as understood by Posner and in accord with Morris's approach to semiotics. Elsewhere (Ponzio 1990a, 1997b, 2001) we have proposed, as a branch of syntactics which studies combination rules applied to verbal form complexes, an 'interpretive linguistic theory' able to 'generate' (in Chomsky's sense) an utterance in terms of its relation to another utterance that interprets it, an utterance that acts as interpretant. In fact, all utterances are engendered, that is, produced, identified and characterized by their interpretants. According to this approach, the interpretant of a 'sentence' (the dead cell of linguistic system) or, as we prefer, 'utterance' (the live cell of discourse) is not a deep structure grounded in underlying elementary sequences, but another verbal sign. An interpretant identifying an utterance or any verbal sign whatever is simply 'unexpressed' until the conditions are realized for its expression, explicitation'. We have introduced the expression 'identification interpretant' (cf. Ponzio 1990a) for this type of interpretant which

- a) identifies the verbal sign in its phonemic or graphic features;
- b) identifies the verbal sign in its semantic content;
- c) identifies the morphological and syntactic physiognomy of the verbal sign.

Given that the three dimensions of semiosis (syntactical, semantical and pragmatical) are inseparable, the interpretant engendered by an utterance or any verbal sign whatever is not only an identification interpretant. It is also an ‘answering comprehension interpretant’ which has a special focus on the pragmatical dimension of signs. Without the interpretant of answering comprehension, it is difficult or even impossible to recognize the sign at the level of phonemic or graphemic configuration, morphological and syntactic structure, as well as semantic content.

Just as we have highlighted the presence of syntactics in all aspects of signs, in the same way we must underline that the question of meaning (i.e., of the relation between interpreted and interpretant) is also present at the level of identification of the units composing words, phrases, utterances and texts.

Semantics: referent as designatum and denotatum

Article 3, ‘Semantik’, deals with the signified, and in particular, with the conventional meaning of signs and the problem of denotation. Instead, Article 4, ‘Pragmatics’ deals with sign users and with the circumstances of sign use in communication as well as in other types of semiosis.

Concerning the semantic dimension we wish to remember the important contribution made by Morris to sign theory in relation to the issue of the referent. At a given moment in the recent history of semiotics referential semantics was contrasted to nonreferential semantics. The starting point of the debate was Ogden and Richards’s famous but often deviating triangle with its distinction between the three apexes denominated ‘symbol’, ‘thought or reference’ and ‘referent’. Under the influence, among other things, of Saussure’s

binary conception of sign as the relation of a *signifiant* to a *signifié*, meaning was described as the relation of a ‘symbol’ to ‘thought or reference’ (see § 3.1.1, ‘Semantik’, in Article 101 on Saussure and his followers, *S/S*, 2: 2053-2054). Thus the question under debate became whether or not the ‘referent’ should be eliminated from this triangle. Supporters of nonreferential semantics included Stephen Ullmann (1951, 1962) and Umberto Eco (1975). Subsequently, Eco (1984) became aware of the need to recover the concept of referent and did so implicitly by resorting to the Jakobsonian concept of *renvoi*.

In any case, if we accept Morris’s distinction between designatum and denotatum the question of the referent and its misunderstandings are easily solved. This distinction was originally proposed by Morris in his 1938 book, *Foundations of the Theory of Signs*, it is taken up again with terminological variants in his book of 1946, *Signs, Language, and Behavior* and again in subsequent writings. However, his position as described in 1938 remains the most convincing.

‘Where what is referred to actually exists as referred to the object of reference is a denotatum’, says Morris (1971: 20). For example, if the sign ‘unicorn’ refers to its object considering it as existent in the world of mythology, that sign has a denotatum since unicorns do exist in mythology. On the contrary, if the sign ‘unicorn’ refers to its object considering it as existent in the world of zoology, that sign does not have a denotatum since unicorns do not exist in zoology. In this case the sign has a designatum (Morris 1938b), or a significatum, as Morris (1946) was later to call it (see below), but it does not have a denotatum. ‘It thus becomes clear that, while every sign has a designatum, not every sign has a denotatum’ (1971: 20). By using Morris’s distinction between designatum and denotatum misunderstandings in regard to the referent can in fact be avoided.

In the triangular diagram of the sign as proposed by Ogden and Richards (1923) the referent is always foreseen and forms one of the three apexes. On the contrary, in other semantic theories, the referent is eliminated altogether on the basis of the fact that what the sign refers to does not always exist in the terms referred to by the sign. In this case the designatum is obviously not taken into account. On the contrary, as has been amply demonstrated (Ponzio 1985, 1990a, 1993b, 1997b; Ponzio, Calefato, Petrilli 1999), the sign has a referent always, or in Morris's terminology, a designatum, and if this referent exists in the terms referred to by the sign, it also has a denotatum.

Indeed, the object of reference, referent, or Object in Peirce's sign triad, is a component of semiosis. In Ponzio 1990a (33-36) we proposed to consider the referent as an implicit interpretant. In other words, the referent of a sign is another sign to which the former refers implicitly. Once explicited, the referent changes position and becomes an interpretant with an explicative function; while the sign which had a referent, i.e., the sign with implicit meaning, becomes an interpreted.

What is called by Glottob Frege (1892) '*Bedeutung*' is the referent, i.e., an implicit interpretant. For example, 'Venus' is a referent or implicit interpretant in the expressions, 'The morning star', 'The evening star', 'The luminous point that shines in the sky at sunset'; and, instead, an explicit interpretant or, in Frege's terminology, '*Sinn*', in the sentence, 'The luminous point that shines in the sky at sunset is called Venus'. With respect to 'Venus', transformed from referent or implicit interpretant into explicit interpretant in the examples above, 'one of the planets in the solar system' is an implicit interpretant, or referent, which if explicated becomes an explicit interpretant with another implicit interpretant or referent, such as, for example, 'the second planet from the Sun', and so forth. Any sign at all, however explicative it may be, always leaves given

parts of its interpretive route unsaid. In the example above, the interpretive route of ‘planet’, which makes it an interpretant of ‘Venus’, is implied. However, the word ‘planet’ has yet other implicit interpretants, i.e., other referents, and so it goes on. Therefore, ‘sense’ in Frege’s famous distinction between *Sinn* and *Bedeutung* is a particular way of referring to the referent (*‘die Art des Gegebenseins des Bezeichneten’*), i.e., it is an explicit interpretant, respect to which the referent is an implicit interpretant. § 3.1.3, ‘The beginnings of logical semantics’, 1494-1496, in Chapter X, *S/S*, 2, discusses the implications in semantics of Frege’s reflection beginning with the distinction between *Sinn* and *Bedeutung*. On this distinction, see also § 2, ‘Freges linguistische Wende der Sinnanalyse’, 2077-2082, and ‘Textinterne Designation und externe Referenz’, 2089, in Article 102, ‘Frege und seine Nachfolger’, by Pirmin Stekeler-Weithofer, *S/S*, 2: 216-2095. In same article, § 5.1, ‘Die drei Bereiche von Gegenständen’, confronts Frege’s conception of referent with the Morrisian distinction between ‘designatum’ and ‘denotatum’ (cf. 2089).

Referent (object), interpretant, and interpreted (representamen, sign vehicle) are, therefore, three different functions carried out by the sign. A referent is an implicit part of an interpretive route that the explicit part (interpretant) refers to. The impossibility of expliciting all interpretants of a sign given that they are infinite in number (Peirce’s ‘infinite semiosis’) causes every sign to have a referent (implicit interpretant) just as it has meaning (explicit interpretant). Meanings (and therefore signs) without a referent do not exist. Consequently, that the referent, or object of reference, is a component of semiosis, means that the referent is not external to sign reality, even if as a ‘dynamical object’ it is external to a current semiosis. It is not possible to refer to something without this something becoming part of an interpretive route, i. e.,

without it being an implicit interpretant or interpreted. Referents are not external to the network of signs.

The referent is a *denotatum* if it exists in the sense of ‘exist’ as referred to by the sign; it is a *designatum* if it does not exist in the sense of ‘exist’ as referred to by the sign. The sign always has a referent, in certain cases only as a *designatum*, in others also as a *denotatum*.

As anticipated, in *Signs, Language, and Behavior*, Morris maintains the distinction between *denotatum* and *designatum* with the introduction of a terminological variation — the term ‘*designatum*’ is replaced with the term ‘*significatum*’. In the words of Morris: ‘Those conditions which are such that whatever fulfills them is a *denotatum* will be called a *significatum* of the sign’ (Morris 1971: 94). The sign or sign-vehicle, as Morris says, may be said to *signify* a *significatum*. *To signify, to have signification* and *to have a significatum* may be interpreted as synonyms. In his description of the conditions which allow for something to function as a sign, the *significatum*, similarly to the *designatum* with which it identifies, is differentiated from the *denotatum*. All signs have a *significatum* and therefore *signify*, but not all signs *denote*. The *significatum* expresses the conditions under which a sign can have a *denotatum* and therefore will *denote*. Therefore, if the conditions obtain such that a sign *denotes*, the sign is endowed both with *significatum* and *denotatum*. The *significatum* of the buzzer (sign) which attracts the attention of Pavlov’s famous dog (interpretant) is that something edible is available; the food found by the dog which enables it to respond in a certain way (interpretant) as provoked by the sign, is the *denotatum*. To the dog’s great disappointment, however, the latter may actually not exist!

As stated above, in *Foundations of the Theory of Signs* (Chp. II) Morris uses the term *designatum* instead of *significatum*. Every sign insofar as it is a

sign has a designatum, but not every sign has a denotatum, because not every sign refers to something that actually exists in the terms referred to: instead, where what is referred to (significatum or designatum) actually exists in the terms referred to, the object of reference is a denotatum. In other words, the designatum or significatum is what the sign or sign-vehicle refers to. It is a set of qualities forming a class or type of objects or events to which the interpreter reacts independently of the fact that what is referred to actually exists (denotatum) according to the existence value attributed to it by the sign.

In *Signification and Significance* (1964), Morris replaces the term ‘significatum’ with ‘signification’ while the term ‘denotatum’ is dropped altogether. Here, *signification* replaces what Morris variously called *denotatum/designatum* (1938b) and *significatum* (1946). That the object of signification cannot function as a stimulus does not mean that what gives itself to direct experience cannot be signified. The point is that only a part of an object can be perceived directly; and this is the part that functions as the stimulus or sign vehicle. The part not fully perceived functions, instead, as the signified object, the object of signification. We say that ‘this is a desk’ on the basis of our limited experience of the object in question, that part which is perceived directly and interpreted as a sign of the fact that we are dealing with a desk on the basis of the hypothesis (implying the risk of error) that there exist parts we do not actually see — the back of the desk, its underside, the drawers, etc.

Pragmatics

In *Foundations* Morris establishes a correspondence between the three branches of semiotics and three orientations in philosophy: ‘formalism’ or ‘symbolic

logic' which is related to syntax; 'empiricism' which is related to semantics; and pragmatism to pragmatics. According to Morris, although 'pragmatics' derives specifically from 'pragmatism', as a specifically semiotic term it receives a new signification. Chapter V entitled 'Pragmatics' in Morris 1938b opens with the following statement:

The term 'pragmatics' has obviously been coined with reference to the term 'pragmatism'. It is a plausible view that the permanent significance of pragmatism lies in the fact that it has directed attention more closely to the relation of signs to their users than had previously been done and has assessed more profoundly than ever before the relevance of this relation in understanding intellectual activities. The term 'pragmatics' helps to signalize the significance of the achievements of Peirce, James, Dewey, and Mead within the field of semiotic. At the same time, 'pragmatics' as a specifically semiotic term must receive its own formulation. By 'pragmatics' is designated the science of the relation of signs to their interpreters. 'Pragmatics' must then be distinguished from 'pragmatism', and 'pragmatical' from 'pragmatic'. (1971: 43)

Morris defined pragmatics as the study of the relations of sign vehicles to interpreters or more simply as 'the relations of signs to their users' (1938b). Unlike Rudolf Carnap (1939) who restricted the field of pragmatics to verbal signs only to include nonlinguistic signs much later (1955), Morris's conception of pragmatics concerns both verbal and nonverbal signs. John L. Austin (1962) and John Searle (1969) also limited their interest in the pragmatical dimension to verbal signs. On the contrary, Morris goes so far as to include the ethic and aesthetic dimensions as well. Morris's interest in the relation of signs to values is closely connected with pragmatics which deals with the relation of signs to

interpreters. Speech act theory (cf. the entry, ‘Speech act theory’, by Alec Machoul, *ES*: 591-592) ‘is both distinct from and to some degree competitive with theories of significatory and systemic difference proposed by the semiotician’ (591). In our opinion, the substantial difference between speech act theory and Peircean or Morrisian semiotics is that the former fails to consider two factors in the pragmatic dimension of meaning which, on the contrary, must not be neglected: interpretation and alterity. In other words, speech act theory does not account for the interpretant of answering comprehension. This is a consequence of the fact that the concept of verbal sign (in John L. Austin and John R. Searle) lacks a semiotic foundation.

In his Appendix to *Signs, Language and Behavior* Morris includes a paragraph on Peirce’s contribution to semiotics (1971: 337-340). The aspect Morris found most interesting about Peirce’s work (in spite of what he described as his mentalistic limitations) was his emphasis on behavior. Peirce maintained that *to determine the meaning of a sign we must identify the habits of behavior it produces*, and this, in fact, is a position which resounds in Morris’s own orientation. In Morris’s view, Peirce had the merit of rejecting old Cartesian mentalism and replacing it with the concept of *habits of behavior* and, therefore, of directing semiotics towards a more adequate account of sign-processes.

In Posner’s formulation of the ‘necessary and sufficient conditions for something to be a semiosis’, *A* interprets *B* as representing *C*.; where *A* is the interpreter, *B* is some object, property, relation, event, etc., and *C* is the meaning that *A* assigns to *B*. In a Peircean perspective we prefer the formulation that *A* is an *Interpretant* used by some interpreter (a responsive ‘somebody’) to relate *B*, the Representamen, to *C*, the Object.

To stress either the ‘interpreter’ factor or the ‘interpretant’ factor is not indifferent. Should the interpretant be stressed, pragmatics as a branch of

semiotics and the pragmatical dimension of semiosis may be related together with the other branches of semiotics and dimensions of semiosis to Peirce's trichotomy of representamen (syntactics /syntactical), object (semantics/semantical) and interpretant (pragmatics /pragmatical).

As stated, Morris defines pragmatics as the study of the relation of signs (sign vehicles, representamina) to interpreters or sign users. In referring to another element with respect to Peirce's sign trichotomy, this definition may induce one to erroneously think that the pragmatical relation is external to the sign. On the contrary, however, the pragmatical relation belongs to the sign trichotomic relation as a pivotal condition of semiosis, which is, in Morris's words, the 'action of sign'. Of course, there is no sign without an interpretant and consequently an interpreter, for the interpretant is the effect of a sign on an interpreter. Yet, given that the interpreter does not subsist as such if not as a modification ensuing from the effect of a sign in an open chain of interpretants, the interpreter is also an interpretant and, therefore, a sign. In 'Some Consequences of Four Incapacities', Peirce explains the correspondence between man and sign, interpreter and interpretant, but that there is a correspondence does not imply that one of the two concepts forming these pairs can be eliminated for each term evidences different aspects of semiosis.

The whole semiosis comprises both 'interpreter' and interpretant as well as other factors. Morris's *Signification and Significance* introduces some terminological innovations regarding the components of semiosis:

- Sign or sign vehicle*, the object acting as a stimulus for sign behavior;
- Interpreter*, any organism acted upon by the sign vehicle. The concept of interpreter is extended to include any organism whatever, and, therefore, any type of sign behavior beyond the human. This orientation in semiotic studies is

developed especially by Sebeok who promotes ‘zoosemiotics’, ‘biosemiotics’ and ‘global semiotics’ (cf. above).

—*Interpretant*, the disposition to respond to a certain type of object as the result of a sign stimulus.

—*Signification*, the object to which the interpreter responds through an interpretant, that is, the signified object which as such cannot function simultaneously as a stimulus.

In Morris’s terminological changes regarding the components of semiosis, the concepts of *interpreter* and *interpretant* remain constant.

Stressing the interpretant rather than the interpreter, pragmatics concerns the interpretant which does not merely identify the interpreted, thereby acting as an ‘identification interpretant’, but responds and takes a stand towards it. This is what we have called the interpretant of answering comprehension which, unlike the identification interpretant, is specific to a sign interpreting its actual sense. Sign interpretation in terms of answering comprehension opens to interpretive trajectories connected with sense, advancing towards signness or semioticity beyond signality. Rather than use the term ‘meaning’ in relation to interpretants whose task it is to identify interpreteds, or ‘sense’ for interpretants whose task is not limited to merely identifying the interpreted, we may distinguish between *two zones of meaning*, that of signality (the object of syntactics) and that of signness (the *object of pragmatics*). As anticipated, the interpretant relative to the signal and to signality is the *identification interpretant* (cf. Ponzio 1985; Ponzio 1990b; Ponzio 1997b; Ponzio, Calefato, and Petrilli 1999); instead, the interpretant specific to the sign, that which interprets its actual sense has been called *respondent* or *answering comprehension interpretant*. This interpretant or this dimension of the interpretant concerns the pragmatological dimension of the sign, that is, the sign as such. The relation between interpreted and respondent

comprehension interpretant depends on the models, habits and customs of the world in which the interpreted-interpretant relation is situated. The interpretant of answering comprehension is the conclusion of a line of reasoning in an inferential process with a dialogic structure. Pragmatics deals with the relation between the sign vehicle or ‘representamen’, the interpreted and the interpretant in its full sign nature, that is, as the interpretant of answering comprehension.

Sign conceptions in different cultures and epochs

The sixteen chapters of *Semiotik/ Semiotics* can be grouped into six ideal basic parts, which are introduced in both the ‘Preface’ and ‘Presentation’. They are ideal parts because they are neither mentioned in the Contents nor in the work. The indication of six parts has a double function: to direct the reader in one’s approach to the volumes and to offer information concerning organization of the subject matter by the Editors. The six parts are the following:

A: Theoretical foundations; B: History of semiotics; C: Contemporary semiotics; D: The relationship between semiotics, other interdisciplinary approaches, and the individual disciplines; E: Applied semiotics; F: Working tools for semioticians. Parts A, B, and C belong to volumes 1 and 2. The rest is included in volume 3.

Part A includes Chapters I-IV (Articles 1-31) and presents the systematics of semiotics, its theoretical bases, general topics (aspects and types of semiosis) and methodological issues. For the reasons exposed at the beginning of this paper, this is the part we have dealt with most insistently.

Part B deals with methods and problems in the historiography of semiotics (Chapter V, Articles 32-35) and provides a survey of implicit semiotic thought in

different cultures and epochs of Western history (VI-X, Articles 36-88) as well as in Non-Westerns cultures (XI, Articles 89-99). Volume II, as mentioned, begins with Chapter IX on sign conceptions from the Renaissance to early 19th Century.

Article 32 offers a general outline of decisive stages in ‘The development of sign conceptions in the evolution of human cultures’ (by Harald Haarmann, *S/S*, 1: 668-710). This article continues the work of Articles 18 and 25 on the evolution of semiosis as anthroposemiosis, covering such aspects as the evolutionary processes of symbol-making since the Paleolithic era (§ 3), the typology of human culture (§ 7), iconicity and writing and the bias concerning these in sign theories (§ 4). Of some interest in this article is also the analysis of mnemotechnic forms different to writing, i.e., oral mnemotechnics through which is preserved cosmogonic, cosmologic, and ethic information in genres of oral literature such as myths, legends, and variants of ritual speech, etc. (§§ 6, 7). Furthermore, this article, which ranges far and wide over Western and Non-Western cultures (for instance, it refers particularly to oral and pictorial mnemotechnics as practiced by the Australian aboriginal), confirms the omniscience of ‘writing’ understood in a broad sense, i.e. as species-specific human modeling and as something different from transcription. Concerning the problem of the diversity of human symbolism (§§ 1 and 8) in different cultures (see also the entry ‘Cultural difference’, by Vicki Kirby, *ES*: 183-187), let us add that the relationship between sign and difference may be understood in two senses as expressed in two formulas: ‘the sign makes the difference’; ‘the difference makes the sign’. An aberration which threatens intercultural relations is the use of signs to make differences to the end of marking identities. The sign used in this way is the sign reduced to signality. On the other hand, the difference that makes the sign is not only difference as in the expression ‘to

differ from' inside the sign system (for instance, at the paradigmatic level, between synonyms, in binary phonemic oppositions, etc.). More than this, it is a question of difference that makes the sign especially in the sense that the sign exists solely in relation to another and different sign, that is, the interpretant (Derrida's neologism 'différance' may be used to highlight this other meaning of 'difference') (cf. § 3 and § 4 in Article 122, 2230-2233, by Peter Rusterholz, 'Poststrukturalistische Semiotik' [Post-structuralist semiotics], *S/S*, 2: 2329-2339). The former conception of the relationship between sign and difference ('the sign makes the difference') separates cultures and sets them against one another, each marked in its own identity. The latter conception ('the difference makes signs') fosters friendship among cultures, for everyone finds in a different culture the interpretant of one's own signs and one's own diversity. In this case cultural differences relate to each other dialogically. The dialogic relation among cultures is the only way out of dogmatism and relativism which, instead, fail to acknowledge others and lead to their oppression (cf. Ponzio 2001).

The three following articles in Chapter V focus on methodological issues relative to the 'History and historiography of semiotics' (the title of Article 34 by Eco, *S/S*, 1 730-746). These articles discuss the general problems announced in their titles: 'Probleme der Erfassung von Zeichenkonzeptionen in Abendland' ['Problems in the explication of Western sign conceptions] (by Aleida Hasman, 710-729); 'The beginnings of scientific semiotics' (by Marcel Dascal and Klaus D. Dutz). On the relationship between 'semiotics' and 'history' and on the history of semiotics and the semiotics of history, see the rich entry 'History' (by Michael Harkin, in *ES*: 285-289).

This presentation of Western sign conceptions begins with the culture of Celts, Ancient Germanic peoples, and Ancient Slavs. This is followed by the history of semiotics in Ancient Greece and Rome and in the Middle Ages,

including the Jewish and Christian world-views. We also wish to mention Article 61, ‘Sign conceptions in the Judaic tradition’ (1183-1198, by our prematurely deceased friend Claude Gandelman). According to Emmanuel Lévinas the Bible and Greek thought are the principal sources of Western culture. Thus in a history of Western semiotics, reference to the Judaic conception of sign is particularly relevant. After an exposition of ‘the corpus of relevant writings’ (§ 1) the paragraphs that follow deal with ‘sign names and sign concepts in the *Torah*’: symbols, iconicity, indexicality (§ 2); ‘Judaism as conflict between iconic and anti-iconic tendencies: the scripture as “body”’ (§ 3); ‘*Gematria*: the *Torah* as symbolic mathematics’ (§ 5); ‘the *Torah* as a speech act’ (§ 6); ‘levels of exegesis: the Christian connection’ (§ 7); ‘pre-deconstructionist aspects of Judaism’ (§ 8).

Volume 2 begins with Chapter IX on the history of Western semiotics from the Renaissance to the early 19th Century, followed by Chapter X on Western semiotics from the 19th Century to the present. This reconnaissance of sign conceptions in Western cultures and through the successive epochs of Western history concerns different practices, customs, disciplines and arts: myths, rites, religion, habits in everyday life, art, aesthetics, general philosophy, grammar, rhetoric, stylistics, poetics, logic, philosophy of language, mathematics, music, architecture and fine arts, medicine, natural history, biology, physics, and economics. Chapter XI is dedicated to the remarkably complex and elaborate sign conceptions of Non-Western cultures in religion, art, and everyday life. Paragraphs forming Chapter XI (89-99) deal with sign conceptions in the Ancient Middle East, in the Islamic world, in Non-Islamic Africa, in India, China, Korea, Japan, Indonesia and the Philippines, South East Asia, Oceania, in the Ancient Americas.

History and theory of semiotics

Part B, which illustrates the history of semiotics in Western and Non-Western cultures, extends from the second half of the first volume (exactly p. 669) to over the first half of the second volume (p. 2015), for a total amount of 1343 pages. Nevertheless, the first section (Chapter V, 95 pages) of this part proposes a methodologic perspective and consequently may be associated with Part A on theoretical foundations in itself consisting of 667 pages.

Part B is a very useful instrument of research in semiotics on both a historical and theoretical level. It complements the systematic presentation of semiotics as a science in Part A with a unique survey of the explicit or implicit semiotic thought of semioticians and so-called ‘cryptosemioticians’ (Sebeok) in the various cultures of the world and in different historical epochs. This careful investigation shows that the history of semiotics is far more extensive than is ordinarily presented. Its origins appear much more ancient with respect to its superficial history from a phonocentric and glottocentric point of view. This part is also an important contribution to understanding the various trends currently operative within semiotics as described in Part C (Chapter XII).

We shall not dwell upon this subject now. We only wish to underline, for instance, how interesting it is for biosemiotics to be aware of its connection with medical semiotics in Ancient Greece, or for syntactics, semantics and pragmatics to know of sign conceptions in logic and dialectics in the Latin Middle Ages (see Article 49, ‘Zeichenkonzeptionen in der Philosophie des lateinischen Mittelalters’ [Sign conception in philosophy in the Latin Middle Ages], by Stephan Meier-Oeser, S/S, 1: 984-1022).

We shall return to medical semiotics in Ancient Greece later on. Concerning the second topic we wish to draw attention to Article 52, ‘Sign conceptions in logic in the Latin Middle

Ages' (by Stephen F. Brown, *SS*, 1: 1036-1046). Most of this article deals with the theory of supposition or reference theory whose development can be traced in the logical works of well-known authors in the second half of the thirteenth century: William of Sherwood's *Introductiones in logicam*, Peter of Spain's *Tractatus (Summule Logicales)*, Roger Bacon's *Summule Dialectices*, and Lambert of Auxerres's *Summule Logicales*. The theory of supposition offers a remarkable contribution to the above-mentioned debate on the problem of the referent. Furthermore, we may better understanding Peirce's conception of the sign and use it in our research on this subject if we consider the influence of Medieval logic in his studies (on 'Medieval semiotics' see also the corresponding entry by Michael Ruse, *ES*: 399-404).

A glance at the Index of Proper Names in the *Collected Papers* soon reveals that Medieval logicians are well represented in Peirce's thought system. Peirce had a profound knowledge of Medieval logic to which he often referred in his criticism of modern logic: in fact, he measured the imprecision and unfoundedness of certain statements made in modern logic against the more precise and rigorous statements of Medieval logic. We have dealt elsewhere with the relation between Peirce's semiotics and Medieval logicians (see Ponzio 1993a: 70-82 and Petrilli and Ponzio 1996: 351-364). Here we only wish to remember the theory of supposition as it is exposed in *Tractatus* or *Summule logicales* by Petrus Hispanus (probably written towards the beginning of 1230, It. trans., 1985 by Ponzio; see also Ponzio 1990a) and its surprising similarity to Morris's distinction between 'designatum' and 'denotatum', dealt with above. Peirce criticized Prantl's mistaken conviction that *Tractatus* was the Latin translation of a Greek work (by Psellus). *En passant*, the reader will also find Greimas's square in *Tractatus* (see 'Semiotic square', by Paul Bouissac, *ES*: 565-568). In any case Peirce was aware of the potential importance of the

Tractatus as a handbook in logic thanks to its extraordinary capacity for synthesis. In his own words (Peirce *CP* 2.323n):

The *Summule* of Petrus Hispanus are nearly identical with some other contemporary works and evidently show a doctrine which had been taught in the schools from about A. D. 1200. After Boëtius, it is the highest authority for logical terminology ...

In the light of supposition theory, Petrus Hispanus distinguished between *significatio* and *suppositio*, on the one hand, and *appellatio*, on the other. Therefore when a term or proposition expresses something nonexistent, or when the existence of something nonexistent is simulated, this does not imply that the term or proposition does not have a referent or a *suppositio*, but rather that the *appellatio* is lacking. We have an *appellatio* in addition to the *significatio* and the *suppositio* when the object referred to really exists (cf. Petrus Hispanus 1972: 196).

This distinction is analogous to that proposed by Morris in 1938b, when he divided Ogden and Richard's *referent* into the concepts of *denotatum* and *designatum*. We have a *denotatum* when the sign — with its interpretant (Petrus Hispanus's *significatio*) — refers to something that exists in the terms referred to. Otherwise the sign has a *designatum* all the same, but it does not have a *denotatum*.

We wish to make a further comment on the relation between the history and theory of semiotics with particular reference, once again, to sign conceptions in the Middle Ages. We believe that the history of Medieval semiotics cannot disregard the inheritance of the Fathers of the Church whom to defend themselves against the charge of iconoclasm and idolatry reflected on the icon

and its specificity with respect to other signs. Such reflection is of great interest in semiotics not only from the historical and historiographical viewpoint but also from the theoretical. We are now referring specifically to three apologetic conversations by Johannes Damascenus (675-749) about icons (1983) and to the Proceedings of II Ecumenical Council at Nicaea (which we could perhaps consider as the first international conference in semiotics) of 787. (For a semiotic treatment of the icon as a pictorial genre, see Uspensky 1973).

It is interesting to note that Peirce only used the term ‘icon’ as part of his sign typology in a subsequent phase of his research. Before then other terms were used including ‘likeness’, ‘copy’, ‘image’, ‘analogue’, while ‘icon’ was introduced as late as 1885. Another interesting observation is that initially Peirce used the term ‘representation’ to indicate what in a second phase he called ‘sign’.

In the entry ‘Icon’ (*ES*: 293) Sonesson states that

... icons in the religious sense are not particularly good instances of icons in the semiotic sense ...

On the contrary, in our opinion the characteristics of the icon in Peirce’s sense are not different from the icon understood in the religious sense. In opting for the term ‘icon’ as well as for the term ‘sign’ instead of ‘representation’, Peirce was probably influenced, even if indirectly, by the concept of icon as described by the Fathers of the Church and the Nicaean Council thanks to his profound knowledge of philosophy in the Middle Ages (cf. L. Ponzio 2000. See also ‘Image and picture’, by G. Sonesson, *ES*: 299-300).

Further comments. Semiotics and ethics

Part C, ‘Contemporary semiotics’, coincides with Chapter XII, ‘Current trends in semiotics’ (*S/S*, 2: 2016-2339) and includes 23 articles (100-122). It describes the various trends active within semiotics of which it presents the most important issues, concepts, methods and results by means of the conceptual apparatus developed in chapters I-IV of Part A and Chapter V of Part B.

We have already mentioned almost all articles in Chapter XII. To complete the list of articles belonging to this pivotal chapter in *Semiotik/Semiotics*, we shall simply signal their titles for we are unable to deal with them now: Art. 105. Semasiologie und Onomasiologie [Semasiology and Onomasiology] (by Kurt Baldinger); Art. 107. ‘Der Konstruktivismus’ [Constructivism] (by Gerrit Haas); Art. 108. ‘Praxiology’ (by Ursula Niklas); Art. 112. ‘Bühler and his followers’ (by Robert E. Innis); Art. 121. ‘The approach of Goodman’ (by Soeren Kjoerup).

This chapter is complemented by chapter X, especially Article 74, on sign conceptions in general philosophy from the 19th century to the present, and by Article 77 on sign conceptions in the philosophy of language in the same period. For example, it is interesting to observe that the exposition of Peirce’s semiotics in Article 100 of Chapter X is lacking in reference to ethic and social problems while it emphasizes cognitive problems. Instead, Article 74 of Chapter X not only completes this aspect with § 7, ‘Erkenntnistheorie und Zeichenarchitektonik’ (*S/S*, 2:1436), but also includes a part on the ethic and social dimension of Peirce’s research: § 23, ‘Peirce und soziale Dimension der Zeichen’.

As we have claimed elsewhere against a reductive interpretation of Peircean semiotics (see Petrilli 1997, 1999b, and in Sebeok, Petrilli, Ponzio

2001: 73-135), the problem of the relation to others, of dialogue and ethical responsibility are no less than pivotal in Peirce's conception of the human subject. An aspect of Peirce's sign theory that should not be underestimated is its contribution towards a redefinition of the subject. In a Peircean perspective the human being, the self, viewed as a sign, coincides with the verbal and nonverbal language it is made of, with thought. The subject comes into being as a semiotic process with the capacity to engender a potentially infinite number of signifying trajectories in the dynamics of the relationship between utterance and interpretation. As says Peirce, 'men and words reciprocally educate each other; each increase of a man's information involves and is involved by, a corresponding increase of a word's information' (*CP* 5.313). Insofar as it is a sign, that is, a sign in becoming, the subject emerges as a dialogic and relational open unit, an ongoing process evolving in the intrapersonal and interpersonal dialogic interrelationship with other signs and other subjects. The dialogic conception of thought and subjectivity as developed throughout the course of his research may be traced back to Peirce's early writings. Insofar as it is a sign, the subject's boundaries are not defined once and for all and can only be delimited in the dialogic encounter with other signs and other subjects. The human person is born into a community where experiences are lived as one develops in relation to the experiences of the other members of that community and never isolatedly from it.

[W]e know that man is not whole as long as he is single, that he is essentially a possible member of society. Especially, one man's experience is nothing, if it stands alone. If he sees what others cannot, we call it hallucination. It is not 'my' experience, but 'our' experience that has to be thought of; and this 'us' has indefinite possibilities. (*CP* 5.402, n. 2)

We may state that insofar as it is grounded in the logic of alterity, the self as understood by Peirce is a community in itself, indeed is no less than a community of dialogically related selves:

Two things here are all-important to assure oneself of and to remember. The first is that a person is not absolutely an individual. His thoughts are what he is ‘saying to himself’, that is, is saying to that other self that is just coming into life in the flow of time. When one reasons, it is that critical self that one is trying to persuade; and all thought whatsoever is a sign, and is mostly of the nature of language. The second thing to remember is that the man’s circle of society (however widely or narrowly this phrase may be understood) is a sort of loosely compacted person, in some respect of higher rank than the person of an individual organism. (*CP* 5.421)

In an intersubjective perspective, the subject is a fact of communication continuously changing roles from speaker/utterer to listener/interpreter in the dialogic exchange among interlocutors. The self’s discourse is never its own but rings with the discourse of others. In a Peircean perspective and in accordance with Bakhtin, we may say that the word is never neutral but rather is impregnated with the words, thoughts, experiences, actions and feelings of others. In Peirce’s opinion, the finite self or ‘personal self’ is an ‘illusory phenomenon’. However, to the extent that human beings are egotistical they believe they can live and flourish separately from others, from the human community they in fact belong to. And to the extent that they believe this, they create the conditions for such illusory forms of isolation. In reality, self can never be wholly divided or separated from the other. As Peirce teaches us,

human existence completely isolated from the other is not possible. Furthermore, isolatedness is not a guarantee of the uniqueness or singularity of the single individual, of self's specificity, of one's otherness with respect to the otherness of others. To be a self means to be a possible member of a community, so that, as mentioned above, what counts and should be theorized is not 'my' experience but 'ours' (cf. *CP* 5.402 n.2). In any case, of some interest is how Peirce associates the social and communitary character of self with such values as self's uniqueness, singularity, signifying otherness with respect to any given interpretive process whatsoever.

With regard to the ethic and social implications of semiotic investigation, another student of signs in addition to Peirce, Bakhtin, Morris (see especially *The Open Self, Varieties of Human Value, and Signification and Significance*), is undoubtedly Victoria Lady Welby (see Petrilli 1998; Sebeok 2001b: 146-148). Unfortunately, in *Semiotik/Semiotics*, the article on 'Significs' (104), the name of the semiotico-philosophical trend founded by Welby, reserves a rather small space for such an important scholar while highlighting the Signific Movement in the Netherlands which originated from Welby's research through the mediation of Frederik van Eeden.

The term 'significs' was coined by Victoria Welby towards the end of the nineteenth century to designate her own approach to the theory of meaning, with its special focus on the interrelationship between sign, sense — in all its signifying implications — and value. Welby contributed significantly to the development of a modern theory of meaning both through her correspondence with some of the most eminent figures of her time as well as her published writings: these include her books of 1903, *What is Meaning? Studies in the Development of Significance* (now 1983), and of 1911, *Significs and Language. The Articulate Form of Our Expressive and Interpretative Resources* (now in

Welby 1985) as well as her papers of 1893, ‘Meaning and Metaphor’, and of 1896, ‘Sense, Meaning, Interpretation’ (now in Welby 1985; on Welby’s work see Petrilli 1998). Charles K. Ogden, who co-authored *The Meaning of Meaning* (1923) with Ivor A. Richards, spent two years as a university student (between 1910 and 1911) studying signification with Welby, an experience which to a degree oriented his formation and interest in problems of language and meaning (Gordon 1990a, b, 1991; Petrilli 1990b).

Welby’s signification transcends pure descriptivism in the effort to analyze signs in their ethical, esthetic and pragmatic dimensions beyond the epistemological and cognitive boundaries of semiotics, where semiotics and axiology intersect. Welby’s proposal of signification arises from the assumption that the problem of sign and meaning cannot be dealt with separately from consideration of the place and value that meaning has in all possible spheres of human interest and purpose. Her project pushes beyond the limits of semiotics understood as ‘cognitive semiotics’ as much as beyond the specialism of semantics. Being concerned with problems of meaning in everyday life and not just in relation to specialized sectors, signification invites us all, not just the specialist but each one of us in daily life, to ask the question ‘What does it signify?’, which is not intended to interrogate linguistic meaning alone but also the value something has for us. Consequently, signification emerges as a method in mental exercise with implications of an ethic and pedagogic order, relevant to interpersonal and social relationships and therefore to making responsible choices.

Other expressions used by Welby to designate her theory of sign and meaning, or signification, is ‘philosophy of significance’ and ‘philosophy of translation’, which highlight different aspects of her approach. The significance of signs increases with an increase in translative processes across different types

and orders of signs. In fact, translation as described by Welby is a method of interpretation and comprehension and as such is pioneeristically conducted into the territory of reflection on sign and meaning. In this context translation is not understood solely in interlinguistic terms, though it is this too, but even more significantly in terms of intersemiotic and intralinguistic translation, to say it in Roman Jakobson's terminology. All signs and expressions are already translations in themselves, as confirmed by Peirce's concept of sign. Mental activities, as Welby maintains — once again in accordance with Peirce — are automatic translative processes. Welby's theory of translation is structural to her signification and is closely connected with her reflections on the figurative nature of language, therefore on the role carried out by metaphor, analogy, and homology in the development of thought, knowledge and communication processes. Thanks to such an approach signification also emerges as a method for the enhancement of awareness, for augmenting and mastering translative processes as the condition for understanding the sense, meaning and significance of verbal and nonverbal behavior at large. As such Welby's signification concerns the ethic dimension of sign life and its study beyond the strictly cognitive or epistemological dimension.

A musical note and an appeal to the early vocation of semiotics for the care of life's health

In the first and second volumes of the *Semiotik/Semiotics* handbook music is a topic in the study of signs, analyzed in different cultures and successive epochs of Western history: sign conceptions in music in Ancient Greece and Rome (Article 43, by Albrecht Riethmüller), in the Latin Middle Ages (Article 54, by

Franco Alberto Gallo), from the Renaissance to the early 19th century (Article 68, by Mario Baroni), from the 19th century to the present (Article 81, by Eero Tarasti). Moreover, in the forthcoming third volume discussion of the relationship between semiotics and the individual disciplines (Chapter IX) includes an article (152, by Guerino Mazzola) on semiotics of music. As in the case of other disciplines, the discussion concerning music and musicology also focuses on the epistemologically relevant question as to the extent to which the subject matter, methods, and ways of presentation in this discipline can be understood as sign process. But what we wish to observe is that music is not just another among many other subjects in semiotics. Music is a special subject.

With respect to semiotics and the other sciences of language, music has proven to be a very difficult topic given that it is indomitable if treated in the light of the verbal language paradigm. Among the various languages music is the one that more than any other resists the phonocentric approach to semiosis. Semiotics of music must answer the question: ‘which semiotics is a semiotics of music?’. On referring to music, semiotics must be ready to discuss its own categories and methods. Music can be understood as a sign process, on the condition that semiotics is a ‘semiotics of music’. In the latter expression ‘of music’ is a subject genitive, i.e., ‘semiotics of music’ not in the sense of semiotics as applied to music, but semiotics as a perspective of music, semiotics as proposed by music. Since music is inconceivable without the attitude of *listening*, semiotics of music is semiotics, also in the sense of general semiotics, understood as *semiotics of listening*. Instead of questioning the different and various kinds of signs on the basis of pre-existing categories, semiotics thus described is first of all listening. Global semiotics is not such simply in terms of extension but first and foremost because of its capacity for listening (on these

aspects of general semiotics and semiotics of music, see Ponzio 1993a: 138-154, and Ponzio, Lomuto 1997).

Listening evokes auscultation, a medical posture. In Ancient Greece music was thought to have a therapeutic character. On the other hand, semiotics finds its origins first of all in semeiotics, classified by Galen as one of the principal branches of medicine (on sign conceptions in medicine in Ancient Greece, see Article 45, by Volker Langhoff, *S/S*, 1: 912-921; on the medical origin of semiotics, see Sebeok 1994b: 50-54; on Galen in medical semiotics, see Sebeok 2001b: 44-58). Besides auscultation and other ways of inspecting symptoms, diagnosis and anamnesis following Galen include listening to the patient who is invited to talk about his ailments and to tell the story of his troubles.

Medicine today, as denounced by Foucault, is functional to exercising what he calls 'bio-power', to promoting the techniques of subordination of the body to the knowledge-power of *biopolitics*. Medicine contributes to the controlled insertion of bodies into the production apparatus. With its specialism and its manipulation of bodies as self-sufficient entities, medicine strengthens the dominant conception of the individual as belonging to spheres of interest and of needs that are separate and indifferent to each other. In such a context listening becomes 'direct, univocal listening', imposed by the Law (Barthes and Havas 1977: 989), by the 'order of discourse' (Foucault 1970), it becomes 'applied listening', 'wanting to hear', imposition to speak and, therefore, to say univocally. *Listening* is one thing, *to want to hear* is another. Listening is answering comprehension: 'listening speaks', says Barthes (1990) similarly to Bakhtin; listening is turned to signs in their constitutive dialogism. By excluding responsive listening, the will to hear or applied listening belongs to a 'closed discourse universe' (Marcuse), which fixes questioning and responsive roles and separates listening from responsive comprehension. Unlike listening understood

as dialogue and answering comprehension which continuously produces new signifiers and interpretants without ever fixing a sense, ‘applied’ listening takes place in a rigid network of speech roles: it maintains the ‘ancient places of the believer, the disciple, the patient’ (Barthes and Havas 1977: 990).

The attitude of listening is decisive for the role of global semiotics, for the capacity to understand the entire semiotic universe as well as to discuss the different forms of separatism and the different tendencies to take the part for the whole, whether by mistake or in bad faith. This is the case of individualism in social and intercultural life as well as of the current ‘crisis of overspecialization’ (*S/S*, 1: xxix) in scientific research.

The capacity of semiotics for listening is an effective condition for the connection of semiotics with its early vocation and expression as medical semeiotics, described especially by Sebeok. If semiotics is interested in life over the whole planet since life and semiosis coincide, and if the original motivation for the study of signs is ‘health’, we may make the claim that a non negligible task of semiotics, especially today in the era of globalization, is to care for the whole of life in its globality.

* Roland Posner, Klaus Robering and Thomas A. Sebeok (eds.) *Semiotik/Semiotics*, Vols. I and II. (Vol. III forthcoming). Berlin: Walter de Gruyter, 1997-1998.
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