

The semiotic machine, linguistic work, and translation*

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Resumé

Sign activity or *semiosis* is a translation process. Different types of semiosis – information (or signification) semiosis, symptomatization semiosis, communication semiosis – involve different roles in the interpretive function of signs. Human beings are endowed with a species-specific modeling device called language, with a capacity for meta-semiosis, therefore with the capacity not only to use signs directly, but to reflect on signs. Insofar as the human animal is endowed with language and the capacity for metasemiosis it is a semiotic animal. The meta-translative capacity is inherent in the semiotic capacity and finds its strongest expression in special modalities of the similarity relation (the iconic dimension of signs), e.g., metaphorical transposition (this is recognized by cognitive semiotics today, but it had already been intuited by Vico with his “poetic logic”). Computers establish a relation between hardware and software and between material nonlinguistic work and immaterial linguistic work. High level artificial intelligent machines, the semiotic machine, are also capable of metasemiosis. As such these machines call for a redefinition of the relation between man and machine. The semiotic machine amplifies the human capacity for translative processes above all in qualitative terms as testified by the hypertext. The issue at stake goes far beyond the opposition between mechanical and automatic translation to involve the metamorphosis of linguistic work. Linguistic work is immaterial work. As immaterial work linguistic work is now our main productive resource. At the same time this resource is incommensurable in terms of equal exchange market logic and cannot be contained by today’s production system.

1. Semiosis, semiotics, and translation

1.1. Foundations of a theory of translation

Sign activity or *semiosis* is a translation process. To translate is neither merely to “decodify” nor to “re-codify”. Of course such operations are part of the translative process, but they do not exhaust it. *In the first place, to translate is to interpret.*

If we agree with Charles S. Peirce (1839-1914) that signs do not exist without an interpretant and that the meaning of a sign can only be expressed by another sign acting as its interpretant, translation is constitutive of the sign. As stated, sign activity or *semiosis* is a translation process.

Meaning is indissolubly interconnected with translation, in fact is engendered in translative processes. This clearly emerges when meaning is described as an “interpretive route” (cf. Ponzio 1995 [1985]; Petrilli and Ponzio 2005). If we agree with Peirce that signs do not exist without another sign acting as interpretant, it will be evident that meaning is engendered in semiotic processes and is inseparable from the work of translation or interpretation.

Similarly to Peirce and his concept of sign, Victoria Welby (1837-1912) too believed that all signs are translations in themselves, in other words, translation is structural to the generation of signs.

Welby designated her theory of sign and meaning with the term ‘significs’. She also used other expressions to highlight different aspects of her approach such as ‘philosophy of interpretation’, ‘philosophy of significance’ and ‘philosophy of translation’. The significance of signs increases as translative processes increase across the different types and orders of signs. Welby was a pioneer in associating translation with reflection on sign and meaning. She described

translation as a method for enhancing the sense, meaning and significance of verbal and nonverbal behavior at large. To increase translative processes means to enhance the human capacity for understanding and critical awareness.

Welby's theory of translation is a fundamental aspect of her signification and is closely connected with her reflections on the figurative nature of language, therefore on the role of metaphor, analogy, and homology in the development of thought, knowledge and communication processes.

Following this line of thought and again in accordance with Peirce, not only did Welby specify that mental activities are *translative processes*, but even more significantly she maintained that they are *automatic* translative processes (see below).

In the context of semiotics understood as the science, or doctrine, or theory of signs, translation is not merely understood as interlingual translation, but far more broadly as intersemiotic and intralingual translation (see Jakobson 1963).

In the semiotic, or biosemiotic, or better global semiotic perspective (see Sebeok 2001), it is now obvious that translation does not only concern the human world, *anthroposemiosis*, but far more extensively it emerges as a *constitutive modality* of semiosis in general, or, more exactly, *biosemiosis*. Translative processes pervade the entire living world, the great biosphere. (For examples of endosemiotic and intersemiotic translative processes, see Sebeok 1998a and 1998b).

With respect to the human cultural world, translation generally refers to the relationship among texts in different historical-natural languages. However, to translate is not only to transit from one language to another – *interlingual translation*. Other forms of translation must also be taken into consideration beyond this common form (and which in truth cannot be taken for granted given that it implies very complex operations). Translative processes may be internal to the same language; they may occur across verbal sign systems and nonverbal sign systems and viceversa; among nonverbal sign systems; and again among nonverbal languages (strictly speaking languages, whether verbal or nonverbal, can only occur in the sphere of anthroposemiosis).

We propose a distinction between *endosemiotic* translation and *intersemiotic* translation: the first is internal to a given sign system; the second refers to translative processes across two or more sign systems. Both types of translation occur in the living world in general, and not only in the human cultural world. Where there is language (It. *linguaggio*), including eventually verbal language, intersemiotic translation is specified as *intersemiotic* translation. When translative processes take place exclusively among languages (from nonverbal signs to the verbal and viceversa or solely among nonverbal signs), we have *interlinguistic* translation. Here the adjective “linguistic” derives from language-in-general (It. *linguaggio*) and not from historical language (It. *lingua*). When translative processes take place in a single language (*linguaggio*), we have

endolinguistic translation. When *linguistic* translation takes place in verbal sign systems, we have *endoverbal* translation. Endoverbal translation may be specified as: a) *interlingual* when a question of transiting across different historico-natural languages; or as b) *endolingual* when a question of transiting among languages in a single historical-natural language. *Endolingual* translation may, in turn, be differentiated into: bi) translation from oral verbal signs to written verbal signs and viceversa. In this case we may speak of *diamesic endolingual* translation (from *diamesia*, linguistic variation relatively to the medium of expression); bii) *diaphasic endolingual* translation (from *diaphasia*, linguistic variation relatively to the different registers: colloquial, formal, professional, etc.); and, biii) *diglossic endolingual* translation (from *diglossia*, the term introduced by Fishman and Ferguson for socially connoted bilingualism and the dichotomy between *high language* and *low language*, for example, standard or national language and dialectical forms of expression).

1.2. Three levels of semiosis: information or signification, symptommatization, communication – a biosemiotic perspective

Three different levels of semiosis pertain respectively to signification, symptommatization, and communication. These involve different roles in the sign's interpretive function which correspond to different roles in the translative function.

Thure von Uexküll, son of the biologist and “cryptosemiotician” Jakob von Uexküll (1864-1944), distinguishes between three different types of semiosis characterized in terms of the different roles carried out by the emitter and receiver. Th. von Uexküll calls these three types of semiosis:

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

In the case of *semiosis of information or signification* the inanimate environment acts as a ‘quasi-emitter’ without a semiotic function. Instead, the receiver is a living entity, a living system and renders meaningful whatever it receives via its receptors. In this type of semiosis the receiver performs all semiotic functions.

Instead, in the case of *semiosis of symptommatization* the emitter is a living being. It sends out signals that are not directed towards a receiver and do not expect an answer. The receiver receives signals as signs called ‘symptoms’.

In the case of *semiosis of communication* signs are emitted specifically for the receiver and must translate into the meaning intended by the emitter (see Posner *et alii* 1997-2004, 1: 449-450).

In our own terminology, and in accordance with Peirce, rather than speak of emitter and receiver these three types of semiosis may be reformulated in terms of interpretant sign and interpreted sign and their different roles.

1) an *interpreted* may become a *sign* simply because it receives an interpretation from an interpretant. This interpretant is a response (*semiosis of information or signification*); or

2) before being interpreted by the interpretant, the interpreted sign is already an interpretant response (*symptom*) though it did not originally intend to be interpreted as a sign (*semiosis of symptomatization*);

3) before being interpreted by the interpretant, the interpreted is already an interpretant response but unlike case 2) it arises with the intention of being interpreted as a sign and requires another interpretant response (*semiosis of communication*).

Reformulation of Th. von Uexküll's typology of semiosis in terms of interpreted and interpretant participation in the interpretation process, instead of 'emitter' and 'receiver' participation, serves to emphasize the role of the interpretant in semiosis. Therefore, it evidences the connection between semiosis as an interpretive process and translation.

1.3. Encoding and decoding understood as transduction

Sebeok (1991a: 27-29) explains the notions of *encoding* and *decoding* in terms of *transduction*. Transduction consists of a series of transformations in the source and destination operated on the basis of the *interpretation* of a probable homology between meaning and an externalized serial string – for example, speaking or writing or gesturing. Transduction as encoding or conversion by the source becomes decoding or reconversion by the 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. (Sebeok 1991a: 28)

1.4. Two important distinctions in biosemiotics

In his entry 'Biosemiotics' included in *Encyclopedia of Semiotics* (ed. Paul Bouissac, from now on *ES*), Jesper Hoffmeyer emphasizes two important distinctions in biosemiotics:

the first between *endosemiotics* (sign processes inside organisms) and *exosemiotics* (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)

1.5. *Semiotics as metasemiosis*

Another meaning may be added to the term ‘semiotics’ beyond its meaning as the general science, or theory, or doctrine of signs: the term ‘semiotics’ may be used to indicate *the specificity of human semiosis* (see Sebeok, ‘Semiosis and semiotics: what lies in their future?’, 1989, now in Sebeok 1991a: 97-99). This second meaning of the term ‘semiotics’ is of central importance for a transcendental founding of semiotics: it explains the conditions of possibility of semiotics as a science and metascience. 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)

‘Semiotics’ understood as indicating the specificity of human semiosis is implicitly connected with the general plan of *Semiotik/Semiotics* (1997-2004, a handbook edited by Roland Posner, Klaus Robering and Sebeok, from now on *S/S*) and the typology of semiosis therein proposed.

Chapter III, “Types of Semiosis” begins with an article by Sebeok entitled “The evolution of semiosis”. This article explains the correspondence between the different 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. Human beings are endowed with a species-specific modeling device which Sebeok calls ‘language’. *Homo habilis* was endowed with *language* thus understood but not with what Sebeok calls *speech*. In the light of this specific modeling device or language anthroposemiosis may be characterized in terms of *semiotics*. Where there is language understood as a modeling device there is semiotics understood as language (and not as the name of the science of signs). Sebeok’s distinction between *language* and *speech* corresponds, even if roughly, to the distinction between *Kognition* and *Sprache* made by Müller in his book of 1897, *Evolution, Kognition and Sprache* (cf. *S/S*, 1: 443).

The world of life coincides with semiosis (see *S/S*, 1: 436-37). By comparison with semiosis in general, human semiosis has a special characteristic, the capacity for *metasemiosis*, that is, reflection. This capacity ensues from the fact that humans are endowed with a special type of modeling device, which we have also called ‘language’ thanks to its syntactic nature. Not only are signs in the sphere of anthroposemiosis the object of interpretation in terms of immediate response, but also in terms of suspension of immediate response, reflection and possibility to deliberate. The capacity for metasemiosis is specifically human and may also be called ‘semiotics’. Developing Aristotle’s observation that man tends by nature to knowledge (see the beginning of his *Metaphysics*), we may claim that man tends by nature to semiotics (see Petrilli 1998b).

The species-specific capacity for metasemiosis or use of signs to reflect on signs characterizes the human modeling device and is what makes the human being not only a ‘semiotic animal,’ but also a ‘semiotic animal’. Inherent in metasemiosis is the capacity for metatranslation. The metatranslative capacity finds its strongest expression in a special modality of tracing connections. We are alluding to translative processes operated on the basis of the relation of similarity (the iconic dimension of signs), as in the case of metaphorical transposition (now theorized by cognitive semiotics, but already intuited by Giambattista Vico with his “poetic logic”, see below).

‘Metasemiosis’ or ‘semiotics’ thus described is connected with the capacity for meta-translation. And metaphorical transposition is an aspect of this structural capacity for translation in the human animal.

1.6. Translation and metaphor as a modeling strategy and cognitive device

Translation is an aspect of a “connective form” theorized by Sebeok and Marcel Danesi (2000), a special type of modeling strategy traditionally described as metaphorical.

In light of Peirce’s semiotics the metaphor is an icon, precisely an *iconic metasign* (*CP* 2.276-277). Metaphor presupposes the human modeling device and its articulation, or *language*. We shall briefly examine the relation between metaphor and articulation in verbal language, and between icon and modeling in general.

The importance of metaphor has always been underestimated by traditional linguistics (Chomsky went so far as to consider the metaphor as an aberrant dimension of expression). On the contrary, in line with more recent developments in linguistics classified as *cognitive linguistics*, Sebeok and Danesi invest the metaphor, therefore we may add, translation, with a major role in human modeling. *Metaphors We Live By*, a book of 1980 by George Lakoff and Mark Johnson has been described as “the most influential book-length study on metaphor” (see the entry “Metaphor”, by Charles Forceville, in *ES*: 411-414). Lakoff and Johnson argue that metaphors are far more pervasive in everyday speech and writing than has been acknowledged hitherto (412).

Before Ivor A. Richards and his book of 1936, *Philosophy of Rhetoric*, the role of metaphor in language and thought had already been evidenced by 19th century scholars Victoria Welby and Giovanni Vailati, and before them by Giambattista Vico (see the entry ‘Vico, Giambattista’ by Gustavo Guerra, in *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)

For Vico, too, the metaphor is an original and fundamental structure in human thought, and not just a rhetorical device used for ornamentation, a mere question of style. From this point of view, a close connection may be established between cognitive linguistics and Vico’s poetic logic (see Danesi 2000; on Vico in semiotics, see Sebeok 2001: 135-144).

Language as a modeling device relates iconically to the universe it models. This emerges clearly in the tradition of thought in semiotics delineated by Peirce, Jakobson and Sebeok. An equally important connection may be established with Wittgenstein’s *Tractatus*, particularly his notion of ‘picturing.’

The iconic character of the proposition implies that picture theory is more complex than isomorphic similarity. To recall Ferruccio Rossi-Landi (1921-1985) and his distinction between analogy, isomorphism and homology, the icon involves homological similarity which is structural and/or genetic.

As a syntactic device that does not represent reality immediately, language *properly speaking*, as Sebeok claims (1991a: 57-58), is a secondary modeling system. The relatively simple nonverbal models used by nonhuman animals and human infants are examples of primary modeling. Such models provide representations of ‘reality’ that are more or less pliable and must secure survival in one’s *Umwelt*.

2. The semiotic machine and translative work

2.1. Semiotic machines and human semiosis in light of autopoietic theory

We may legitimately interrogate the role of machines in semiosis as defined by Peirce, and ask whether machine-semiosis in semiotic machines, i.e., computer-based signs, should be opposed to human semiosis (see Andersen, Asle, Brandt, “Machine semiosis”, in *S/S*, 1, Art. 26). Consistently with research on *autopoietic systems* by two Chilean biologists, Humberto R. Maturana and Francisco J. Varela (cf. 1980), we may reply that human semiosis and machine semiosis do not oppose each other. Indeed, we may submit that under certain respects semiosis in high level artificial intelligent machines and in biological organisms is exactly the same thing (see our treatment of *autopoiesis* theory relatively to the relation between modeling and dialogue in Petrilli and Ponzio 2001 and 2002b).

The term autopoiesis was applied to semiosis in 1973 (see the paper by Maturana and Varela entitled “Autopoiesis and the organization of the living”, now in Maturana and Varela 1980), to name the capacity for self-producing organization unique to living beings. According to this theory living systems are organized autopoietically for self-reproduction through a network of processes that simultaneously produce and reproduce 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*, which it develops in two significant directions (see the entry “Autopoiesis” by Evan Thompson, in *ES*: 53-55):

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 light of autopoietic theory, we may tentatively distinguish between semiotic machines and human semiosis 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. (Article 26, in *S/S*, 1: 569)

2.2. Translative processes between linguistic and nonlinguistic work

The relation between the ‘semiotic machine’, ‘computer-based signs’, or ‘sign machine’, on the one hand, and human semiosis, on the other, whose specific characteristic is language, or, in Rossi-Landi’s terminology, ‘linguistic work’ has been variously analysed.

Work is subordinated to the machine in relation to the development of signs (think of development in knowledge, science, artificial intelligence, skills and specialized competencies). A specific form of subordination is that of linguistic work to the *sign machine*. In the present age the relation between these two poles, linguistic work and the *sign machine*, is ever more a relation of identification than of homology.

Production and communication can no longer be separated and the relation to machines converges with the relation to signs, verbal and nonverbal. Nor is this simply a case of commodities that are messages and messages that are commodities.

Following Rossi-Landi as he shifts from the level of the market to the level of linguistic production and sign production in general, we soon realize that automation not only concerns the system of machines but also the system of languages – language-in-general and the different historical-natural languages, which of course do not operate separately from each other.

2.3. Material work and linguistic work join in the semiotic machine

Human work in the communication-production processes of automation has developed to the level of the semiotic machine. In this context human work is linguistic work. As observed, a homological relation is established between work and its products, on the one hand, and linguistic work and its products, on the other (cf. Rossi-Landi 1975, 1985, 1992a, 1994 [1972]). These two faces of the same human capacity for work, linguistic work and nonlinguistic work, come together in the semiotic machine, as evidenced by the relation between computer software and hardware which cannot be separated. Language is a modeling device structural to human beings and *linguistic work* is related to language, a specifically human semiotic capacity (cf. Sebeok, 'The evolution of semiosis', *S/S*, 1: 443-444).

All this is connected with today's 'global communication-production' world. Beyond indicating that communication now extends over the entire planet, the expression 'communication-production world' indicates that the presentday social reproduction system is characterized by a new phase in production, a phase in which software and hardware at last come together and machines and signs integrate each other reciprocally.

The relation of inexorable interconnectivity between hardware and software presupposes the encounter between material nonlinguistic work and linguistic work. High level artificial intelligent machines are endowed with language and emerge as semiotic machines capable of metasemiosis. And because of the encounter between material nonlinguistic work and linguistic work the relation between machines and human beings needs to be substantially redefined.

2.4. Translation and creativity, from linguistic work to immaterial work

An immediate result of this encounter is that the human capacity for translation is enhanced qualitatively. The hypertexts offered by the semiotic machine are a significant demonstration.

Beyond the question of the differences between mechanical translation and automatic translation the implications involved concern the metamorphosis of linguistic work which is transformed into “immaterial work”. As immaterial work linguistic work may be identified as the main productive resource in today’s social reproduction system. However linguistic and immaterial work are incommensurable in terms of the market and cannot be entirely englobed by the latter.

In today’s capitalist reproduction system the machine can replace intellectual work. This means that machines have reached high levels in automation, and that automation is now communication. The machine too functions as a sign.

This situation may be analyzed from two interrelated viewpoints: the economic and the semiotic and in both cases we are dealing with an event that is new.

As regards the economic aspect communication is no longer relegated to the intermediary phase in the production cycle (exchange) as in former phases in the development of the capitalistic system. Communication now converges with production in the sense that the productive process itself is a communicative process. Communication also converges with consumption, the third phase in the productive cycle for consumption today is above all consumption of communication.

In semiotical terms the development of automation (now extended to operations that in the past were carried out by human intelligence) means to extend communication to the artifact, therefore to the sphere of the artificial, to the inorganic.

All this does not undermine the relation between semiosis and life which in light of recent research we know converge. Communication is now possible for machines, but machines are part of the organic world in the sense that they presuppose biosemiosis, indeed, even more specifically, anthroposemiosis. Machines presuppose a certain level in the historico-social development of anthroposemiosis. And this is the only context where machines function as signs, which makes the difference between human semiosis and machine semiosis (see Article 26, in *S/S*, 1: 569).

2.5. The semiotic machine is endowed with language or metasemiosis

Automatic machines have developed in terms of ‘artificial intelligence’ (see Markus Peschl, *ES*: 44-46) which marks the advent of something new in the field of semiosis over the planet. We may even claim that the semiotic machine represents a whole new ladder with respect to preceding levels (cf. ‘Machine semiosis’, 551).

Traditional automatic machines (mechanical machines that replace physical force) have always communicated, whether internally, that is, inside a single piece of machinery, or externally with other machines. But high level automation today goes beyond the mechanical type of communication relation. ‘Language’, ‘metasemiosis’, ‘semiotics’ have so far been described as a

species-specific characteristic of humans, only possible in the sphere of anthroposemiosis. Now instead they are also possible in machines.

From a semiotic point of view, the expression ‘semiotic machine’ or ‘sign machine’ is particularly meaningful. The machine is now capable of replacing human intelligence, therefore the machine as well is not only capable of semiosis but also of semiotics. ‘Semiotics’ here is understood as metasemiosis, as the capacity for metacommunication, metainterpretation, metatranslation. The automatic machine is now able to replace intellectual work and as such is a machine capable of semiotics – a machine endowed with language.

To reach such high degrees in automation means to extend not only semiosis but also semiotics to the inorganic.

Surprisingly enough what cannot be attained in any other instance of zoosemiosis beyond anthroposemiosis can instead be achieved in the sphere of the inorganic. Semiosis and communication are present throughout the entire organic world, indeed are the criterial feature of life itself, while this limitation on zoosemiosis remains.

Unlike all forms of organic life beyond the human, the inorganic may be communicative at the highest levels of metasemiosis.

This is the most innovative aspect of the sign machine and justifies talk of revolution: the inorganic has become communicative not only in terms of semiosis but also of metasemiosis. Consequently, the machine endowed with language presents the only case of a non-organism that is communicative, and that is communicative not only semiosically but also semiotically.

Therefore, with respect to the biosphere in its globality not only are human beings endowed with the capacity for semiotics or metasemiosis, but also the machines that human beings produce.

2.6. Interactivity between man and machine

At a superficial glance it would seem that high level automation completes the submission of humans to machines. It would seem that machines are no longer mere instruments and that humans are passive agents of the machine.

But the truth is that at high degrees of automation this process is inverted. As machines are progressively more intelligent, humans become active subjects once again. In this interactive process with machines humans recover their function as an indispensable element in the work process. Neither humans nor machines are passive tools but interactive participants in complex exchanges (see Art. 14, ‘Technische Medien der Semiose’, in *S/S* 1). *Interactivity* would seem to be a suitable term to name this exchange relation.

Furthermore, development of technology and artificial intelligence in relation to high-powered automatic machines requires new competencies, quantitative and qualitative, among operators.

Active response from humans must be continuously updated to meet the new tasks proposed with intelligent machine and progress in technology. With earlier forms of automation, typically represented by the assembly line (remember Charlie Chaplin's comico-ironical performance in *Modern Times*), human intelligence was crushed by the machine's capacity for efficiency. Now human intelligence is continuously elicited and challenged for services that are not repetitive but require re-elaboration, redefinition and renewal of one's intellectual and practical competencies.

Differently from machines unendowed with language, intelligent machines elicit interactivity: active, variable response, innovation, updating, permanent training are all necessary and inevitable factors in the man-machine relationship, even if merely for the sake of implementation. The point is that operators are active and not only inventors. Moreover, the interactive relation not only concerns the relation between user and machine, but also between one user and another. The work process now develops through mutual participation, reciprocal assistance, exchange of information, data, etc. The functional scheme is neither linear nor circular. The figure that best portrays this new condition is the grid. Intelligent machines require interactions that develop in networks, and networks that elicit interactions.

2.7. Sociality among humans and in the relation between the individual and the social

On the subject of the individual's active role in today's social system, of some interest are 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):

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.

Interaction between the individual and the social should not be understood as opening to alterity on the outside, for here too the system is autopoietic.

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)

2.8. Incommensurability of work connected with the intelligent machine

The new type of work required by intelligent machines from humans is assimilated to abstract work, to work in general or indifferent work. Assimilation to abstract work is the condition of possibility for the evaluation of work in today's society. In other words, work associated with intelligent machines continues to be quantified according to parameters established for the purchase and sale of work in capitalistic society. Therefore, work related to intelligent machines is still measured in hours.

But the type of work required by the intelligent machine involves specifically human qualities, notably the capacity for language, semiotic sign behavior, complex inferential processes capable of innovation and inventiveness. This type of work resists standard measurement practiced in today's society: that is, measurement in terms of work time. Linguistic and immaterial work is incommensurable and unquantifiable. Human work in relation to the semiotic machine is incommensurable and involves a qualitative leap to which quantity is subordinate. Human work in relation to the semiotic machine cannot be accounted for in terms of quantity.

In spite of its incommensurability as the source of historico-social value, human work has been assimilated to quantified abstract work and measured in hours. In this way human work has been reduced to the status of commodities, which is the condition for the constitution of capitalistic society. The same operation has been applied to linguistic work with the result that capitalist society has also produced the phenomenon of 'linguistic alienation' (cf. Rossi-Landi 1992a, 1992b [1968]). However, never before has capitalist profit depended so heavily on the reduction of linguistic work to the status of commodities as in today's social reproduction system in its 'communication-production' phase (see Ponzio 1999; Ponzio and Petrilli 2000a).

It is paradigmatic that machines are now defined by software (sign complexes) while hardware (the physical machine) has a subordinate role (see Article 26, 'Machine semiosis', in *SS* 1: 551). This represents a fundamental transformation in the production process of artifacts. Symptomatic of the subordination of production to linguistic work are such expressions as 'immaterial investment', 'appreciation of human resources', 'human capital'. These expressions also refer to linguistic work, therefore, to intelligence, the mind, the human brain as inevitable resources in the development of companies and their competitiveness.

As anticipated, a specific characteristic of the human individual is the capacity for metasemiosis, for language, which represents the source of value. However, work continues to be invested with the status of commodities, work is attributed value in terms of commodities. The result is that never before has such a sharp contrast emerged in human work between the inherent capacity to increase its value and its status as a commodity.

While it is manifest that *human* work as such is incommensurable, these days more than ever before work is treated as just another piece of merchandise. The contradiction between linguistic work and the work market is exasperated just as the contradiction between the inherent incommensurability of human work and the systematic demand to commodify work (i.e., to quantify work) is exasperated. This contradiction in today's social reproduction system evidences the quality of linguistic work to a maximum degree, creating a phenomenon that is new and specific to the communication-production era.

This new contradiction between linguistic work and the work market in the contemporary world is a result of the relationship established between work and semiotic machines today.

3. Concluding reflections

3.1. Translation and automatism

High levels of automatism indicate the optimal state of machines; on the contrary, automatism in human beings has negative connotations and is understood as mechanicalness, lack of awareness or lack of control by the mind or will. Yet mechanical operations thought to be proper to humanity, are carried out at far higher degrees in precision and velocity by machines.

The question of automatism should be referred to the possibility of creating automata that are as comprehensive as possible, therefore open and capable of restructuring in response to elicitation from the other with respect to the totality they represent.

3.2. Automatism and otherness

From this point of view, the problem of automatic translation is of crucial importance. With respect to the original, the translated text is at once same and other, "the same other" (see *Athanos 4, Lo stesso altro*, ed. S. Petrilli 2001). To the extent that this condition is achieved the translated text implies both the process of readaptation of the identical and hospitality towards the other. All this is incompatible with automatism understood in terms of the dichotomic schemata characteristic of rigid and closed totalities, organized according to the principles of binary, dichotomic logic.

3.3. Automatic translation and iconicity

The question of automatic translation is essentially the question of the signs used by the automatic machine. The closed universe of the automatic machine renders it unavailable to alterity. On the contrary, exposition to alterity is inevitable in the translative process.

Translation puts into play signs of various types: in Peirce's terminology these include symbols (signs that depend on a law established by convention) and indices (signs that are such on the basis of the law of contiguity and causality).

However, automatic translation also puts into play the use of another type of sign, Peirce's icon which implies the possibility of another type of automatism. We are referring to interpretive interconnections established on the basis of the automatism of associative freedom, likeness or similarity, to the automatism of homological relations. Such interpretive interconnections are creative, inventive and capable of answering comprehension (see Ponzio 2004a: 331-398).

3.4. Translation and new automatism

Automatic translation means to experiment the possibility of a new form of automatism, which not only concerns the machine but man himself. Antonio Gramsci would call this new form of automatism "new rationality" (see *Quaderno* 10, 1932-35, in Gramsci 1975). Gramsci has left us an important corpus of reflections on issues relating specifically to language and translation. His own writings are the object of reflection by scholars who are interested in translative processes of the endolingual type through which Gramsci's writings have been interpreted. From this point of view two recent books by Derek Boothman are worth signaling: *Traducibilità e processi traduttivi. Un caso: A. Gramsci linguista*, 2004, and *Le parole di Gramsci*, 2004. The work of such scholars provides a series of studies on Gramsci's reflections on language with important implications for translation theory.

References

Derek Boothman (2004a). *Traducibilità e processi traduttivi. Un caso: A. Gramsci linguista*. Perugia: Guerra.

— (2004b). *Le parole di Gramsci*. Rome: Carocci.

Bouissac, Paul, ed. (1998). *Encyclopedia of Semiotics*. New York: Oxford University Press.

Danesi, Marcel (1993). *Vico, Metaphor, and the Origin of Language*. Bloomington: Indiana University Press.

— (1995). *Giambattista Vico and the Cognitive Science Enterprise*. New York: Peter Lang.

— (1998). *The Body in the Sign: Thomas A. Sebeok and Semiotics*. Toronto: Legas.

— (2000). *Metafora, lingua, concetto. Vico e la linguistica cognitiva*, Intro. A. Ponzio. Bari:

Edizioni dal Sud.

Gramsci, Antonio (1975). *Quaderni dal carcere*. Turin: Einaudi.

Jakobson, Roman (1963) *Essais de linguistique générale*. Paris: Minuit.

Lakoff, George; and Johnson Mark (1980). *Metaphors We Live By*. Chicago: The University of Chicago Press.

Maturana, Humberto N. (1980). *Autopoiesis: Reproduction, Heredity, and Evolution*. In

Autopoiesis, Dissipative Structures, and Spontaneous Social Orders, ed. M. Zeleny, 45-107. Boulder: Westview Press.

Maturana, Humberto R.; and Francisco J. Varela (1980). *Autopoiesis and Cognition: The Realization of the Living*. Dordrecht: D. Reidel.

Peirce, Charles Sanders (1931-1966). *Collected Papers of Charles Sanders Peirce*, eds. C. Hartshorne, P. Weiss, and A. W. Burks, 8 Vols. Cambridge (Mass.): The Belknap Press, Harvard University Press. (References are to *CP*, followed by volume and paragraph

numbers).

Petrilli, Susan (ed. and Intro., 1-32.) (1992c). *The Correspondence Between Morris and Rossi-Landi*. *Semiotica* Special Issue 88, 1/2.

— (1998a). *Su Victoria Welby. Significs e filosofia del linguaggio*. Naples: Edizioni Scientifiche Italiane.

— (1998b). *Teoria dei segni e del linguaggio*. Bari: Graphis. New ed. 2001.

— (ed. and Intro., 9-21) (1999/2000). *La traduzione*. *Athanor. Semiotica, filosofia, arte, letteratura* X, 2.

— (ed. and Intro., 7-9) (2000). *Tra segni*. *Athanor. Semiotica, filosofia, arte, letteratura* XI, 3.

— (ed.) (2001). *Lo stesso altro*. *Athanor. Semiotica, filosofia, arte, letteratura* XII, 4.

— (ed.) (2003a). *Nero*. *Athanor. Semiotica, filosofia, arte, letteratura* XIV, 6.

— (ed. and Intro.) 1-20. (2003b). *Translation Translation*. Amsterdam: Rodopi.

— (ed. and Intro., 15-25) (2003c). *Linguaggi*. Bari: Laterza.

— (2005). *Percorsi della semiotica*. Bari: Graphis.

Petrilli, Susan; and Patrizia Calefato (2003). *Logica, dialogica, ideologica. I segni fra funzionalità ed eccedenza*, Intro. S. Petrilli, 9-14. Milan: Mimesis.

Petrilli, Susan; and Augusto Ponzio (1998). *Signs of Research on Signs. Semiotische Berichte. Österreichischen Gesellschaft für Semiotik*, Special Issue Jg. 22, 3/4.

— (1999). *Fuori campo. Il segni del corpo tra rappresentazione ed eccedenza*. Milan: Mimesis.

— (2000a). *Il sentire nella comunicazione globale*. Rome: Meltemi.

— (2000b). *Philosophy of Language, Art and Answerability in Mikhail Bakhtin*. New York and Toronto: Legas.

- (2001). *Sebeok and the Signs of Life*. Icon Books: London.
- (2002a). *I segni e la vita. La semiotica globale di Thomas A. Sebeok*. Milan: Spirali.
- (2002b). “Sign Vehicles for Semiotic Travels: Two New Handbooks”. *Semiotica* 141-1/4, 2002, 203-350.
- (2003a). *Semioetica*. Rome: Meltemi.
- (2003b) *Views in Literary Semiotics*. New York and Toronto: Legas.
- (2005) *Semiotics Unbounded*. Toronto: The University Press of Toronto, forthc.
- Ponzio, Augusto (1995). *Segni per parlare dei segni. Signs to Talk About Signs* (bilingual text), Eng. trans. S. Petrilli. Bari: Adriatica. 1st ed. 1985.
- (1999). *La comunicazione*. Bari: Graphis.
- (2004a). *Linguistica generale, scrittura letteraria e traduzione*, Perugia: Guerra.
- (2004b). *Semiotica e dialettica*, Bari: Edizioni dal Sud.
- Posner, Roland.; Klaus Robering; and Thomas A. Sebeok, eds. (1997-2004). *Semiotik Semiotics. A Handbook on the Sign-Theoretic Foundations of Nature and Culture*, 4 Vols. Berlin: Walter de Gruyter.
- Rossi-Landi, Ferruccio (1970). “Linguistic Alienation Problems.” In S. Petrilli 1992, 158-181.
- (1975). *Linguistics and Economics*. The Hague: Mouton. New ed., 1977.
- (1982 [1978]). *Ideologia*. Milan: Mondadori. Eng. trans R. Griffin, *Marxism and Ideology*. Oxford: Clarendon, 1990.
- (1985). *Metodica filosofica e scienza dei segni*. Milan: Bompiani.
- (1992a). *Between Signs and Non-signs*, ed. and Intro. S. Petrilli. Amsterdam: John Benjamins.
- (1992b [1968]). *Il linguaggio come lavoro e come mercato*, ed. A. Ponzio. Milan: Bompiani. Eng. trans. M. Adams et al., *Language as Work and Trade*. South Hadley (Mass.): Bergin and Garvey, 1983.
- (1994 [1972]). *Semiotica e ideologia*. Milan: Bompiani.
- Sebeok, Thomas A. (1991a). *A Sign Is Just a Sign*. Bloomington-Indianapolis: Indiana University Press. It. trans. and Intro. S. Petrilli, *A Sign is just a sign. La semiotica globale*. Milan: Spirali, 1998.
- (1991b). *American Signatures. Semiotic Inquiry and Method*, ed. and Intro. I. Smith.

Norman. London: Oklahoma Press.

— (1998a). *Come comunicano gli animali che non parlano*, It. trans., ed. and Intro. S. Petrilli. Bari: Edizioni dal Sud.

— (1998b). “The Cognitive Self and the Virtual Self”. In *New Approaches to Semiotics and The Human Sciences*, eds. W. Pencak and J. R. Lindgren, 307-321. New York: Peter Lang.

– (2001). *Global Semiotics*. Bloomington: Indiana University Press.

Sebeok, Thomas A.; and Marcel Danesi (2000). *The Forms of Meanings. Modeling Systems Theory and Semiotic Analysis*. Berlin: Mouton de Gruyter.

Vailati, Giovanni (1987). *Scritti*, 3 Vols., ed. M. Quaranta. Sala Bolognese: Arnaldo Forni.

— (2000). *Il metodo della filosofia. Saggi di critica del linguaggio*, ed. F. Rossi-Landi. New ed. A. Ponzio. Bari: Graphis.

Vico, Giambattista (1976). *Principi di Scienza nuova*, 3 Vols., ed. F. Nicolini. Turin: Einaudi.

Welby, Victoria (1983 [1903]). *What is Meaning? (Studies in the Development of Significance)*, ed. and Pref. A. Eschbach, ix-xxxii, Intro. G. Mannoury, xxxiv-xlii. In *Foundations of Semiotics*, Vol. 2. Amsterdam-Philadelphia: John Benjamins.

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