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# THE PLACE OF THE PICTURE IN THE DEVELOPMENT OF HUMAN BEINGS. AT THE CROSSROAD OF SEMIOTICS AND COGNITIVE SCIENCE

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*Summary:* In proposing their theories concerning the development of humans out of the higher primates, psychologists and neurologists such as Deacon, Tomasello and Donald have, each in his peculiar way, accomplished “a semiotic turn”. But these attempts leave a lot to be desired. Most notably, perhaps, they are all (with the exception of Donald, to some degree) incapable of assigning a place to the picture in their evolutionary framework, although everything tends to suggest that picture interpretation is as peculiar a capacity of human beings as is verbal language. Most of them never arrive at a concept of sign that is not simply coterminous with language. On the other hand, semiotics also has a lot to learn from cognitive science, in particular its closeness to empirical investigation.

*Key words:* picture, evolution, semiotic function, mimesis, iconicity

It is high time for a serious encounter to take place between semiotics and cognitive science. The first reason is that cognitive science needs us. In proposing their theories concerning the development of humans out of the higher primates, or, more exactly, from *homo erectus*, as well as at the ontogenetic level, psychologists and neurologists such as Terrence Deacon, Michael Tomasello and Merlin Donald have, each in his peculiar way, accomplished “a semiotic turn”, whether this has occasioned the use of familiar semiotic terminology or not.

## 1. THE “SEMIOTIC TURN” IN COGNITIVE SCIENCE

But these attempts leave a lot to be desired. Most notably, perhaps, they are all (with the exception of Donald) incapable of assigning a place to the picture in their evolutionary framework, although everything tends to suggest that picture interpretation is as peculiar a capacity of human beings as is verbal language. Deacon, who even goes so far in semiotic conversion as to use Peircean terminology, in sometimes rather dubious ways, never arrives at a concept of sign that is not simply coterminous with language.<sup>1</sup> That the semiotic capacity goes beyond the language capacity by now seems generally accepted.<sup>2</sup> And yet in the end, everybody fails to differentiate clearly between the semiotic function (the sign) as such and a particular (but important) instantiation of it, verbal language. This means ignoring other examples of the semiotic function, but also meaning in the sense of something more general than the sign.

On the other hand, semiotics also has a lot to learn from cognitive science. Although

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<sup>1</sup> DEACON, T. (1997; 2003), criticized in SONESSON, G. (2003)

<sup>2</sup> As recognized by most authors in CHRISTIANSEN, M., & KIRBY, S., (eds.), 2003

it is a theoretical stance, just as semiotics, cognitive science has better been able to establish a close relationship to experimental knowledge. Unlike semiotics, it is really, for better or worse, a transdisciplinary perspective, integrating the high speculation of philosophy with *terre-à-terre* psychological experiments. From our point view, however, it is also important that cognitive science does not have the unfortunate tendency to get stuck at the level of the historically late concept of pictorial art, but forces us to ask more fundamental questions concerning the nature of the picture as a cognitive – and semiotic – operation, having an ontogenetic as well as a phylogenetic history.

Semiotics and cognitive science could be said to cover more or less the same domain, characterised as the way in which the world described by the natural sciences appears to human beings, as well as to some animals and robots. But they define this domain differently: for semiotics it is a question of meaning or *mediation*; for cognitive science it is cognition or (for those who dare to use that word) consciousness. Cognitive science also has different central concepts: for semiotics, it is the sign, for cognitive science (at least until recently), it is representation. In the conception of cognitive science, representation is a very wide phenomenon indeed: The perceptual world is "represented" within consciousness. Representations may be internal or external (that is, states of consciousness or such things as words or pictures). In semiotics (at least the kind of semiotics I defend), the world is directly perceived, not represented. Indirect perception may give rise to signs, that is, the semiotic function (which may be external or internal), an instance of which is the picture (as is language).<sup>3</sup>

If there is presently a "semiotic turn" in cognitive science, we should expect there to be a parallel "cognitivist turn" in semiotics. Many semioticians have long claimed to be going cognitivist, but so far we have seen very few concrete results. What is sometimes called "cognitive semiotics" often comes out as an uncritical acceptance of cognitive science. My own work since the eighties is largely based on cognitive psychology (Rosch, Tversky, Neisser, Bartlett, etc.), but that it certainly not enough.<sup>4</sup> It simply means that it takes into account the experimental results of cognitive psychology. Instead, we should perhaps explore the unwitting parallels between the two sciences. One such parallel, which will interest me here, is the part played by memory in Donald's evolutionary scale (where the stages of episodic, mimetic, mythic and theoretic culture correspond to types of memory)<sup>5</sup> and its importance to the communicative situation as conceived by Lotman: Accumulation (memory/conservation), Lotman argues, precedes communication.

The diverse manifestations of Donald's second stage, mime, skill, imitation and gesture are, in my view, (at least in part) iconic (based on similarity) – but for the most part they are tokens conforming to a type - members of a category -, not signs. Somewhere in between mimesis and language the semiotic function arises. In fact, this certainly happens between animal camouflage and pictures. Yet, according to Deacon, iconicity as found in "a portrait" is "not basically different" from the fact of there being no distinction, the perception of the same "stuff" over and over again, camouflage as in the case of the moth's wings being seen by the bird as "just more tree", recognition, that is, the identification of a

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<sup>3</sup> SONESSON, G. (2003)

<sup>4</sup> SONESSON, G. (1989)

<sup>5</sup> DONALD, M., (1991: 2001)

category, or “stimulus generalisation”.<sup>6</sup> This may be true at some level, but it is not useful for determining either the systematic or the developmental properties of different semiotic resources

## 2. THE BEYOND “THE SAME STUFF”. THE PICTURE SIGN

James Gibson has emphasised the dissimilarity of the picture from a real-world scene, thus showing the numerous experiments using pictorial stimuli to study normal perception to be seriously misguided.<sup>7</sup> To both Husserl and Gibson, normal perception gives *direct* access to reality; in contrast, Gibson claims pictures represent a kind of indirect perception, and Husserl tells us that they are “perceptually imagined”.<sup>8</sup> The perception of surfaces, of their layout, and of the transformations to which the latter are subjected, is essential to the life of all animal species, Gibson maintains, but the markings on these surfaces have only gained importance to man, notably in the form of pictures. Surfaces have the kind of meaning which Gibson elsewhere calls “affordances”; the markings on surfaces, however, have “referential meaning”.<sup>9</sup>

“Referential meaning” must certainly be a property of signs. That is, surfaces do not stand for other surfaces, but the markings on surfaces may possibly do so. Contrary to what is often taken for granted, Gibson cannot mean that that which is “directly perceived” is not “interpreted”. An “affordance” in Gibson’s sense is of course an interpretation (relative to an organism), but it does not (necessarily) involve that kind of meaning, which is here called “referential”. *Gestalten*, physiognomic properties, “symbolische Prägnanz”, etc., would be of this kind.

To Gibson, then, the picture is a surface among other surfaces before becoming a sign. Gibson observes that, besides conveying the invariants for the layout of the pictured surfaces, the picture must also contain the invariants of the surface, which is doing the picturing: those of the sheet of paper, the canvas, etc., as well as those of the frame, the glass, and so on. Although Gibson does not use the term, he clearly implies that the picture is a sign, in the sense of being as a surface, which, on being perceived, brings something beside itself into awareness. If Gibson means to suggest that surfaces can never be taken to be something else than surfaces by animals and children he is clearly wrong: we know that even doves may react in the same way to a picture as to that which is depicted. The difficulty, clearly, consists in seeing, at the same time, both the surface and the thing depicted. In other words, in consist in making a differentiation: in telling the “body” of the sign apart from the “body” of the object to which it alludes.<sup>10</sup>

In contrast, when discussing “the reference problem”, Deacon opposes “the way words refer to things” (to which he assimilates rules of etiquette and games) to “a vervet monkey alarm call, a laugh, or a portrait”. No matter what features we attend to, the portrait, in my view, just as any other picture, undoubtedly refers in a way much more similar to words, than does either a laugh or a rule of etiquette. Indeed, Deacon would seem

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<sup>6</sup> DEACON, T. (1997: 74ff)

<sup>7</sup> GIBSON, J., (1978)

<sup>8</sup> HUSSERL (1980); Cf. SONESSON, G., (1989,III.3.6)

<sup>9</sup> GIBSON, J., (1980:xii; 1978:229)

<sup>10</sup> GIBSON, J., (1978:231); SONESSON, G., (1989,III.3.1)

to agree with this. Later on in the text, he talks about “external symbolization in the form of paintings, carvings, or just highly conventional doodlings” which are “the first concrete evidence of the storage of such symbolic information outside of the human brain”. From a Peircean point of view, Deacon is quite right in searching for a “basic sense” of iconicity beyond “the way we typically use the term”, but what he comes up with is both too much and too little. Deacon suggests that iconicity is the fact of there being no distinction: the perception of the same “stuff” over and over again. It is, he maintains, like camouflage: the moth’s wings being seen by the bird as “just more tree”. He goes on to suggest that iconicity is recognition, that is, the identification of a category, and even “stimulus generalisation”. Then he claims that “typical cases” such as pictures are essentially of the same kind: what makes pictures into icons is “the facet or stage that is the same for a sketch and the face it portrays”.<sup>11</sup>

Because of the notorious difficulty of interpreting Peirce, Deacon’s usage can no doubt be justified, but it not of much help if one is interested in other semiotic resources than language. In any case, I have no interest in defending Peircean orthodoxy – but only the *Peircean principle* of using terminology to make our ideas clear. However, it is entirely clear from Peirce’s writings that Firstness supposes a (potential) world deprived of relations (which first are introduced with Secondness): thus, it can never correspond to recognition, stimulus generalisation, or category membership, much less to the picture sign, which all suppose relationships. To the extent that Deacon intends to identify iconicity with what is known in psychology as “categorical perception” he may be right: the perception of something as being identical as long as it appears between a lower and a higher threshold of some property subject to variation. In this respect, iconicity, to Deacon, would be equivalent to what I have elsewhere called the filtering function.<sup>12</sup> It is the meaning of meaning in biosemiotics, as pioneered by Jakob von Uexküll. All objects emitting butyric acid are identical to the tick. Thus, camouflage, to the extent that it is never discovered to be camouflage, the stem, to the extent that its identity is not the product of an act of comparison, and stimulus generalisation, as long as it never becomes conscious as such, could be seen as simple iconicities, that is, repertoires of properties.

Recognition, however, must already be an iconic ground. In one of his well-known definitions of the sign, a term which he here, as so often, uses to mean the sign-vehicle, Peirce describes it as something which “stands for that object not in all respects, but *in reference to a sort of idea*, which I have sometimes called the ground of the representation” (my italics). While some commentators have claimed that Peirce is here talking about some properties of the expression, whereas others favour the content, the ground must really concern the relation between them. Such an interpretation seems to be born out by Peirce’s claim that the concept of “ground” is indispensable, “because we cannot comprehend an agreement of two things, except as an agreement in some respect.” In another passage, Peirce himself identifies “ground” with “abstraction” exemplifying it with the blackness of two black things. It therefore seems that the term ground must stand for those properties of the two things entering into the sign function by means of which they get connected, i.e. both some properties of the thing serving as expression and some properties of the thing

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<sup>11</sup> DEACON, T., (1997:59ff, 365f, 374, 74ff, 77ff, 76ff)

<sup>12</sup> cf. SONESSON, G., (1998a,b; 2000; 2001a, 2003, forthcoming a, b)

serving as content. In case of the weathercock, for instance, which serves to indicate the direction of the wind, the content ground merely consists in this direction, to the exclusion of all other properties of the wind, and its expression ground is only those properties which makes it turn in the direction of the wind, not, for instance, the fact of its being made of iron and resembling a cock (the latter is a property by means of which it enters an iconic ground, different from the indexical ground making it signify the wind). If so, the ground is really a principle of relevance, or, as a Saussurean would say, the “form” connecting expression and content: that which must necessarily be present in the expression for it to be related to a particular content rather than another, and vice-versa.<sup>13</sup>

However, since Peirce always insists that the properties of iconicity and indexicality pertain to objects independently of their entering into a sign relation, we should be able to conceive of iconic and indexical grounds as having other functions; thus, for instance, iconic grounds may be used to create categories of things having some properties in common; and indexical grounds may form the basis for putting things together with the purpose or creating a whole. Thanks to iconic grounds, we recognise things as being of the same general category; and because of indexical grounds, we discover parts of bigger wholes or relations of contextuality.

To see camouflage as camouflage is of course to deprive it of its functionality: it is not meant to be discovered as such. The capacity for doing so is useful for the biologist, as it is of course for the potential victims or predators of the animal using the camouflage. The case of the picture is quite different. It only functions as a picture when it is seen as a picture. This is what is meant by the picture being a sign. It is not a stand-in for that which it represents: like verbal language, it is a way of making the absent thing present as seen from a particular point of view, that is, thematically adumbrated.

Iconicity and sign character are certainly independent, as Peirce claims, because there are iconic grounds, which are not signs, and signs, which are not icons (but indices, symbols, or some combination). In another sense, however, the iconicity of signs is not something which can be considered apart from their sign character: as I have suggested elsewhere, the iconicity of iconic signs is either a consequence of their being signs or a prerequisite for it. In the case of a picture, it is the similarity that posits the sign character; in the case of a car at a car exhibition, or enigmatic scribbles such as Carracci's mason behind a wall, called “doodles” by Arnheim (Fig. 1.), however, it is the sign character that introduces the iconicity.<sup>14</sup>

### 3. FROM ICONICITY TO ICONS

In order to understand the emergence of pictorial signs, we have to discover how and when iconicity combines with the sign function. The first priority is to have a clear concept of sign (Deacon's “symbol”). The sign must be cross-classified with iconicity (“similarity”), indexicality (“connection”) and symbolicity (“regularity”). The concept of “language” (and thus “sign”), as used by Deacon, is too wide and too narrow. It is difficult to see what could be a “particular way of referring” which includes games, ceremonies, and etiquette but which excludes “portraits” along with the vervet monkey alarm calls. On the contrary we need a concept of sign, which includes language, gesture, and pictures, and

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<sup>13</sup> PEIRCE, CH., (1931-58: 2:228, I.551, 1.293). Cf. SONESSON, G., (1989:III.1)

<sup>14</sup> SONESSON, G., (1989; 1993; 1994a, b; 2001a); ARNHEIM, R. (1969.92f)

which excludes (at least some varieties) of games, ceremonies, and etiquette, as well as the vervet monkey alarm calls. This is (more or less) what Piaget called the semiotic function (originally the symbolic function).

According to Piaget the semiotic function (which, in the early writings, was less adequately termed the symbolic function) is a capacity acquired by the child at an age of around 18 to 24 months, which enables him or her to imitate something or somebody outside the direct presence of the model, to use language, make drawings, play “symbolically”, and have access to mental imagery and memory. The common factor underlying all these phenomena, according to Piaget, is the ability to represent reality by means of a signifier, which is distinct from the signified. In several of the passages in which he makes use of this notion of semiotic function, Piaget goes on to point out that “indices” and “signals” are possible long before the age of 18 months, but only because they do not suppose any differentiation between expression and content. The signifier of the index, Piaget says, is “an objective aspect of the signified”; thus, for instance, the visible extremity of an object which is almost entirely hidden from view is the signifier of the entire object for the baby, just as the tracks in the snow stand for the prey to the hunter. But when the child uses a pebble to signify candy, he is well aware of the difference between them, which implies, as Piaget tells us, “a differentiation, from the subject’s own point of view, between the signifier and the signified”.<sup>15</sup>

Piaget is quite right in distinguishing the manifestation of the semiotic function from other ways of “connecting significations”, to employ his own terms. Curiously, the distinction between the subjective and objective points of view is something Piaget seems to forget in the following.<sup>16</sup> We can, however, imagine this same child that in Piaget’s example uses a pebble to stand for a piece of candy having recourse instead to a feather in order to represent a bird, or employ a pebble to stand for a rock, without therefore confusing the part and the whole: then the child would be employing a feature, which is objectively a part of the bird, or the rock, while differentiating the former from the latter from his point of view. Only then would he be using an index, in the sense of an indexical sign.

The hunter, on the other hand, who identifies the animal by means of the tracks, and then employs them to find out which direction the animal has taken, and who does this in order to catch the animal, does not, in his construal of the sign, confuse the tracks with the animal itself, in which case he would be satisfied with the former. Both the child in our example and the hunter are using indices, or indexical signs, where the “real” connection is transformed into a differentiation in the sign. On the other hand, the child and the adult will fail to differentiate the perceptual adumbration in which he has access to the object from the object itself; indeed, they will identify them, at least until they change their perspective on the object by approaching it from another vantage point. And at least the adult will consider a branch jutting out behind a wall as something that is non-differentiated from the tree, to use Piaget’s example, in the rather different sense of being a proper part of it.

But of course contiguity and factorality are present everywhere in the perceptual world without as yet forming signs: we will say, in that case, that they are mere

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<sup>15</sup> PIAGET, J., (1945; 1967; 1970)

<sup>16</sup> SONESSON, G., (1992a, b)



indexicalities. Perception is perfused with indexicality. Each time two objects are perceived together in space, there is contiguity; and each time something is seen to be a part of something else, or to be a whole made up of many parts, there is factorality. Two items present together only become a sign, however, to the extent that one of them, identified as the expression, is directly perceived but not in focus, and the other one, the content, is indirectly perceived while at the same time being the focus of the relation (Fig. 2.).<sup>17</sup> An index, then, must be understood as indexicality (an indexical relation or ground) plus the sign function. Analogously, the perception of similarities (which is an iconic ground) will give rise to an icon only when it is combined with the sign function.

As always, there are passages in Peirce's work, which may be taken in different ways, but it makes more systematic and evolutionary sense to look upon iconicity and indexicality as being only potentials for something being a sign. Iconicity, indexicality, and symbolicity only describe *that which connects two objects*; they do not tell us whether the result is a sign or not. These considerations allow us to separate the study of the phylogenetic and ontogenetic emergence of iconicity, indexicality and symbolicity from that of the corresponding signs (Fig.3.).

While the introduction of the notion of differentiation is a substantial accomplishment on the part of Piaget, he unfortunately never spells out its import. If we look at Piaget's examples, it seems that he attributes the semiotic function only to those expressions and contents which are not only *subjectively*, but *objectively*, different: the pebble in relation to a piece of candy, but not the feather in relation to the bird. The sense of objectivity and subjectivity employed here should of course be related to the common sense world (that is, the Lifeworld) in which human beings stake out their life. Piaget confuses differentiation with symbolicity, that is, the arbitrariness that accounts for the connection between the expression and the content. Yet is difficult to see how this would apply to such varieties of the semiotic function as "symbolic" play, mental images, etc. The confusion may not be purely *ad hoc*: perhaps we first learn differentiation by means of symbolicity. But this is an empirical question.<sup>18</sup>

Let us return, for a moment, to the biosemiotic concept of meaning, epitomized by the world of the tick, or, equivalently, by the same landscape as seen by a human being, a fly, a mollusc, or a dog, as illustrated in Uexküll's pictures.<sup>19</sup> This is meaning as a category, as a filter applied to the world: It consists in picking out some properties and ignoring others. It involves categories in the sense of categorical perception: perceiving only that which is between the higher and lower thresholds. To higher organism, some degree of freedom is clearly involved: the ability to choose between *Umwelten*. When incorporated into the sign concept, this filtering device becomes relevance: the difference between the *theme* and the *background*. Relevance implies the possibility of going from one *Umwelt* to another but also of redefining the *Umwelt* – which the tick cannot do. Relevance is just as possible in pictures as well as in language

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<sup>17</sup> HUSSERL, E., (1939); LUCKMANN, T., (1980).

<sup>18</sup> Other valid criticism may be levelled against Piaget, as discussed in SONESSON, G., (1992b).

<sup>19</sup> VON UEXKÜLL, J. (1956)

#### 4. MEMORY AS ACCUMULATION

If the picture signs suppose the coming-together of iconicity and the semiotic function, then, like language, its emergence has to be evolutionarily explained. According to Merlin Donald, there are several discontinuities in the development that leads from non-human animals to human beings, all involving the acquirement of a distinct kind of memory, considered as a strategy for representing facts (Fig. 4.).<sup>20</sup> Without necessarily taking every detail of Donald's scheme at face value, I am going to make use of it here, because it accounts for a lot of facts, while also permitting a productive integration with semiotic theory.

According to Donald's conception, many mammals, which otherwise live in the immediate present, are already capable of episodic memory, which amounts to the representation of events in terms of their moment and place of occurrence. The first transition, which antedates language and remains intact at its loss (and which Donald identifies with *homo erectus* and wants to reserve for human beings alone) brings about mimetic memory, which corresponds to such abilities as tool use, miming, imitation, co-ordinated hunting, a complex social structure and simple rituals. This stage thus in parts seems to correspond to what I have described as the attainment of the semiotic function (though Donald notes this only obliquely, mentioning the use of intentional systems of communication and the distinction of the referent). Yet, it should be noted already at this point that while all abilities subsumed in this stage seem to depend on iconic relations, only some of them are signs, because they do not involve any asymmetric relation between an expression and the content for which it stands.

Only the second transition brings about language (which, Donald muses, may at first have been gestural) with its semantic memory, that is, a repertory of units, which can be combined. This kind of memory permits the creation of narratives, that is, mythologies, and thus a completely new way of representing reality. Interestingly, however, Donald does not think development stops there, although there are no more biological differences between human beings and other animals to take account of. However, the third transition obviously would not have been possible without the attainment of the three earlier stages. What Donald calls theoretical culture supposes the existence of external memory, that is, devices permitting the conservation and communication of knowledge independently of human beings. The first apparition of theoretical culture coincides with the invention of drawing. For the first time, knowledge may be stored eternally to the organism. The bias having been shifted to visual perception, language is next transferred to writing. It is this possibility of conserving information externally to the organism that later gives rise to science

The stage preceding the attainment of the language capacity requires memory to be located in the own body (Fig. 5.). But, clearly, it can only function as memory to the extent that it is somehow separable from the body as such. While being in the body, it is not *of* the body. In fact, this can only be so, to the extent that some memory traces are instantiated in other bodies at the same time as in the own body. This supposes a distinction between token and type (that is, relevance separating those features which count and which are repeated from all the rest) preceding that of the semiotic function.

Language only seems to require the presence of at least two human beings to exist: they somehow maintain it between them. But pictures must have a body of their own. They

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<sup>20</sup> DONALD, M., (1991; 2001)

must be divorced from the bodies (and minds) of those making use of them. This is of course what is known, mainly in Marxist literature, as the process of alienation. As shown by Cassirer, this process, far from being a “tragedy of culture”, is the prerequisite for all culture. As Husserl noted well before Donald, material embodiment is necessary also for science, starting with mathematics and logic. Independently of both, Ivins pointed out that it is the reproducibility of pictures (as in Floras, for instance) that transforms them into scientific instruments. In this sense, in their capacity of being permanent records, pictures are not, as art historians are wont to say, unavoidably unique, but, on the contrary, they are destined for reproduction. Indeed, they permit repeated acts of perception, as do no earlier memory records. The development of the capacity for reproducing the record itself has a long history recently giving rise to xylography, photography, and the computer picture.<sup>21</sup>

Within semiotics proper, the Tartu school has observed that the accumulation of information as well as of merchandise precede their interchange and is a more elementary and more fundamental characteristic of a culture. According to Lotman and others, material objects and information are similar to each other, and differ from other phenomena, in two ways: they can be accumulated, whereas for example, sleep and breathing cannot, and they are not absorbed completely into the organism, unlike food, but remain separate objects after reception.<sup>22</sup> In reality, a picture is as much a material object as information, as much an artefact as an object of perception. This is why we can accumulate pictures in a double sense: as material things, in the safe-deposit box of a bank, or like experiences in the mind. In both senses they maintain a certain distance with respect to the body. In the world of ideas the content of a book exists indefinitely; but in reality, it evaporates with the last paper copy that moulders away or the last person that dies or forgets the content. It could be argued, however, that while the first case is feasible in the case of books (and of language systems which disappear when the last speaker dies – or, rather, when the last two speaker do), only the second case applies to pictures. Pictures must really be conserved in a material form independent of the human body. They can, however, be preserved as the capacity for reproducing them, that is, as the sequences of repeatable actions, which is an instance of Donald’s mimetic memory. Today, that material form may very well be a computer record. But also computerised information is dependant on the wear of the units of storage such as compact discs and hard discs.

In this sense all information goods are temporarily limited – even though some limitations can be of relatively long duration. Roland Posner distinguishes two types of artefacts: the transitory ones (as the sound of a woman’s high heeled shoes against the pavement) and enduring ones (as the prints that the woman’s shoes may leave in clay, in particular if the latter is later dried).<sup>23</sup> The transitory artefacts, in this sense, also have a material aspect, just as the lasting ones; they only have the particularity of developing in time, which is why they cannot be accumulated without first being converted.

Strictly speaking, the sound sequence produced by high heels against the pavement, and other transitory artefacts, can of course be accumulated (as opposed to being converted into enduring artefacts, which is the case of the sound tape), in the form of the (typical) leg

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<sup>21</sup> CASSIRER, E. (1942: 113ff); IVINS (1953)

<sup>22</sup> LOTMAN et al.(1975)

<sup>23</sup> POSNER, R., (1989)

movements producing this sound, that is, as a mimic record, accumulated in the body, but still distinct from it, since the movements can be learnt and imitated, and even intentionally produced as signs of (traditional) femininity. Posner's example of an enduring artefact is interesting in another way: the cast of prints left by the woman's high heels is of course an organism-independent record, just as the marks of a Roman soldier's sandals found in prehistoric caves, and the hand-prints on cave walls. Another case in point may very well be the so-called Berekhat Ram figure (250-280 000 BP), which, if it is not the likeness of a woman, as has been claimed with very little justification, could be the result of abrasion produced by regular movements indicating the intervention of a human agent (that is, "anthropogenic" movements). This suggests that the first organism-independent records are indexical, rather than iconic, in character. However, even if objects like these were independent objects already in prehistory, there is nothing to prove they were perceived as signs, that is, as expressions differentiated from contents, before pictures were so perceived.

For the moment, we cannot take the phenomenology of memory records much further. Episodic memory may refer to a bodily act, but it is unable to generalise this movement beyond a particular moment and place, and thus it does not give rise to any kind of independent record. Mimetic memory still accumulates in the own body, but it only becomes such, to the extent that what is recorded in the body also exists elsewhere, in at least one other body, which supposes generalisation or, more exactly, typification, the creation of a type referring to different tokens instantiated in different bodies. Typification, in this sense, does not require the semiotic function, but is a prerequisite for it. Mythic memory (which I would prefer to call linguistic memory or perhaps, as Donald sometimes does, semantic memory) is different again: it has a separate existence, but, like some kind of real-world ectoplasm, it requires the collaborative effort of a least two consciousnesses for this existence to be sustained.

Transitory artefacts, as verbal language or (as Posner would have it) the sound of high-heeled shoes on the pavement, acquire a body only to the extent that a sender and a receiver agree roughly on what they are. Only theoretic memory has a distinct body of its own: it subsists independently of the presence of any embodied consciousness, because it itself embodied. Of course, without anybody around to perceive it, organism-independent records are not of any use. Without any human beings present, they are really worse off than the famous acorn falling from a tree without anybody around to hear its sound. In fact, as I have argued in my critique of the critique of iconicity, for at least pictures to be perceived as such, not only the presence of a perceiver is required, but also one who from the start makes some particular presuppositions about the hierarchy of things in the Lifeworld.<sup>24</sup>

## 5. CONCLUSIONS

Iconicity, indexicality, and symbolicity only describe that which connects two objects; they do not tell us whether the result is a sign or not. These considerations allow us to separate the study of the phylogenetic and ontogenetic emergence of iconicity, indexicality and symbolicity from that of the corresponding signs.

Language gives rise to transient artefacts - they only survive within a community for which they constitute common knowledge. The first enduring artefacts (organism-

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<sup>24</sup> SONESSON, G., (1989, 1995, 1997, 1998a, b; 2000, 2001b, forthcoming a)

independent signs) may have been pictures (as suggested by Donald). In a way, pictorial signs may be "more difficult" than language, because they suppose both similarity and difference (i.e. differentiation)

However, the emergence of symbolic signs cannot itself be confounded with that of symbol systems. Systematicity is a property which language shares with some phenomena which do not have any kind of reference at all, such as games, ceremonies and etiquette (independently mentioned by Saussure and Deacon) but which accounts for its difference to some other semiotic resources. There clearly are symbols (symbolic signs in Peirce's sense), which do not have system character.

If all symbols do not form part of sign systems, then is it at least true that all sign systems are made up of symbols? Perhaps semiotic resources of the kind in which iconic and/or indexical grounds dominate do not form sign systems. Then there is the historical issue: do we perhaps need to learn symbols first in the context of sign systems, before we can use them independently, unlike what happens with icons and indices? These are all empirical questions, which should be possible to investigate.

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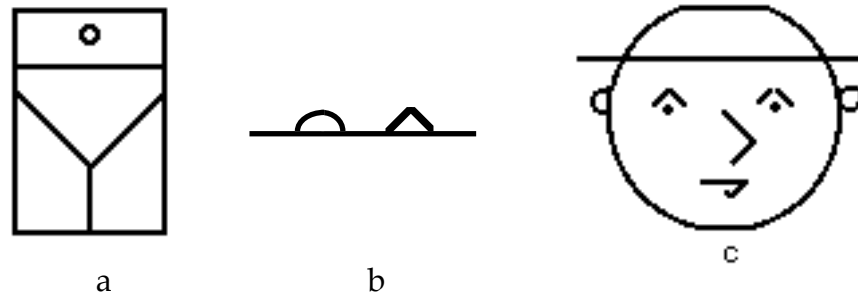


Fig. 1. Two doodles and a picture which can be read as a doodle: a) Olive dropping into Martini glass or Close-up of girl in scanty bathing suit (inspired from ARNHEIM as adapted in SONESSON 1992). b) Carraci's key (Mason behind wall); c) either a picture of a face or doodle which might represent a jar

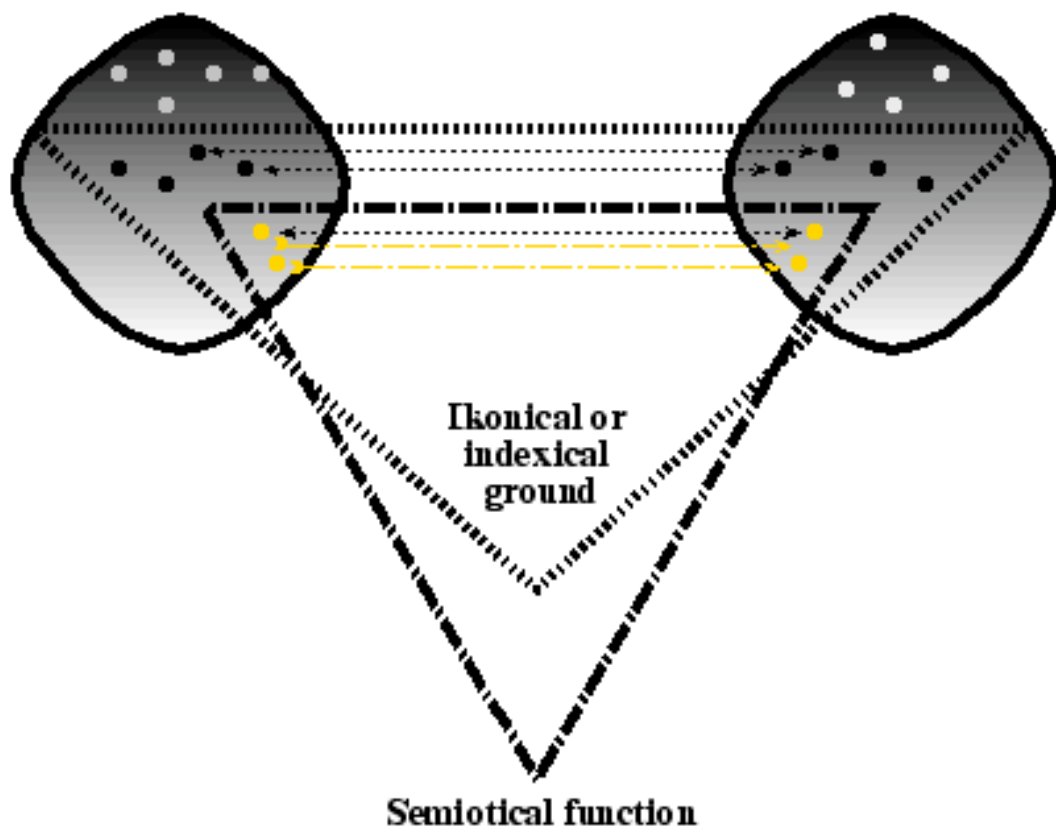


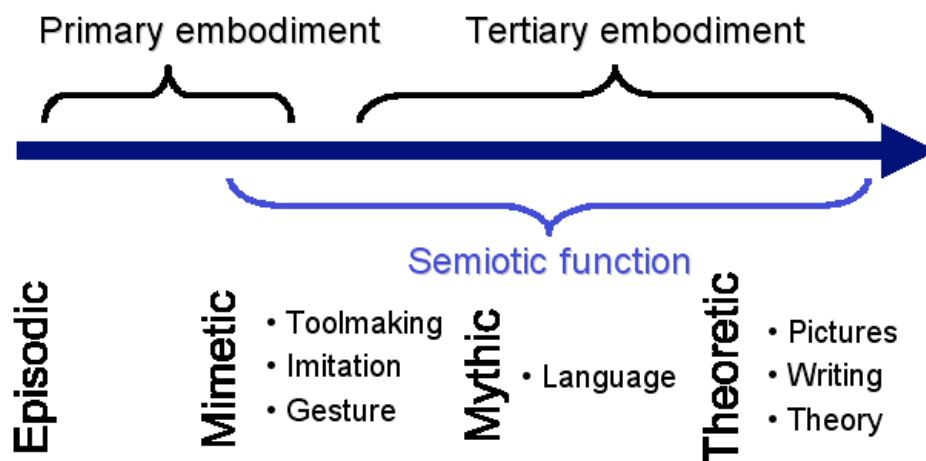
Fig. 2. The sign as a mapping between different spaces, based on different principles of relevance



	Firstness	Secondness	Thirdness
Principle	Iconicity	—	—
Ground	Iconic ground	Indexicality = indexical ground	—
Sign	Iconic sign (icon)	Indexical sign (index)	Symbolicity = symbolic ground = symbolic sign (symbol)

Fig. 3. The relationship between principles, grounds, and signs, from the point of view of Peirce.

# Embodiment in phylogeny and ontogeny



Donald's evolutionary scale (types of memory)

Fig 4. Donald's developmental scheme related to the notion of semiotic function. As understood here, primary embodiment refers to the own body, tertiary embodiment involves organism-independent displays, and secondary embodiment (not discussed here) is the body of the other.

Type of memory	Type of accumulation	Type of embodiment
<b>Episodic</b>	Attention span (event in time/space)	—
<b>Mimetic</b>	Action sequence co-owned by <i>Ego</i> and <i>Alter</i>	Own body
<b>Mythic</b>	Transient artefact co-produced by <i>Ego</i> and <i>Alter</i>	In the interaction between <i>Ego</i> and <i>Alter</i>
<b>Theoretic</b>	Enduring artefact co-externalised by <i>Ego</i> and <i>Alter</i>	External in relation to <i>Ego</i> and <i>Alter</i>

Fig 5. Donald's memory types analysed in relation to the nature of accumulation

