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Sonesson, Göran

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PO Box 117  
221 00 Lund  
+46 46-222 00 00

## CHAPTER EIGHT

# PREPARATIONS FOR DISCUSSING CONSTRUCTIVISM WITH A MARTIAN (THE SECOND COMING)

GÖRAN SONESSON

The use of pictures, such as the Pioneer plaque, in preparing messages for intelligent beings on other planets can easily be seen to overrate the naturality with which pictures present the world of our experience. However, there is a second-order naivety that distinguishes those who pinpoint the conventionality of pictures and is more seldom observed. Indeed, in the psychology of perception, constructivism, which supposes all our perception to rely on social constructs, has long been shown to be untenable – notably by James Gibson, who instead suggested that some general ecological principles must be taken into account. In parallel fashion, I have argued that the critique of iconicity should be supplanted by a semiotic ecology: the general principle accounting for the fact that pictures are perceived as signs by human beings. This means that, if we are to fashion messages understandable to a Martian – or, to put the issue more seriously, to some intelligent extraterrestrial and, most probably, extrasolar being – we do not need to find out in what society he lives: but we have to go far beyond the anthropological universals determining human ecology, which may well be a much more formidable task.

### **Of apes and men: Recognizing the message as such**

Unlike the scholars at the SETI institute, I am not interested in communication with extraterrestrial intelligence (which the researchers at SETI call CETI) in itself. Rather, for me, thinking about communication with extraterrestrials is a *test case* (imaginary so far) for the constraints imposed on semiosis. In fact, traditionally there are two or three ways of investigating the constraints on the *specificity* of the (human) semiotic

function: studying child development; scrutinizing the capacities of apes, monkeys, and other animals; and analysing cultures whose members are not familiar with some kinds of semiotic resources (“primitive” cultures) such as, most classically, pictures. Indeed, the title of the present chapter is a paraphrase of an article written many years ago by the primatologist David Premack, called “Preparations for discussing behaviourism with chimpanzee” (Premack, and Schwatz, 1966). While Premack must have supposed behaviourism to work if he ever were to engage in such a discussion, my own contention is that constructivism is not what is needed to have a conversation with an extraterrestrial. Constructivism, in the relevant sense, is a particular conception about how not only pictures, but all phenomena of the common-sense world, are perceived. It is opposed to the *direct registration theory* of James Gibson. “Ecological psychology” is a better term: perception is only direct for those embedded in an environment of shared presuppositions. Cros’ and Niemans’ codings, which I will discuss below, are clearly very indirect constructs.

At the heart of the distinction between constructivism and other views of perception – as well as the problem of communicating with extraterrestrials – is what Douglas Vakoch (1999) has called “the incommensurability problem”, which may be paraphrased as follows: the models constructed by scientists on Earth vary considerably, in part because of their different social and historical backgrounds; so it would be surprising if such a variability were not augmented by the scientists having come from different planets, in which case biology may also be different. This issue not only is relevant to scientific models but applies to the transmission of any kind of messages. Indeed, in my own version of the communication model (Figure 1), which – deriving its inspiration from the Prague school of semiotics – takes into account the active construal of the message on the part of the receiver, the pool of knowledge, including norms, abductions, and sign systems held in common by the protagonists of the communication process is – following the parallel suggestions of Lotman and Moles – supposed to overlap only in part at the beginning of the process (Sonesson, 1999).

If the act of communication may still succeed, this must either be because the sender takes pains to adapt his pool of knowledge to that of the receiver, or because the receiver does so with respect to the knowledge of the sender – or some combination of both approaches. In the first case, we have what the Tartu school calls a *receiver-culture*; it is, as I have formulated elsewhere, a culture in which it is felt to be the task of the sender to recover the norms and interpretations characteristic of the receiver. The classical case is the pedagogical situation. In the case of a

*sender-culture* on the other hand, the receiver is assigned the task of recuperating the part of the pool of knowledge peculiar to the sender that does not overlap with his own. High art, as well as mystery cults, are of this kind (Sonesson, 1999). Hermeneutics, as a science with practical goals, was developed for the latter situation. Philosophical hermeneutics, on the other hand, often envisions some kind of combination of the two processes: a “fusion of horizons” in Gadamer’s (1960) famous phrase. The incommensurability problem, in its extreme forms, suggests the opposite case: the overlap between the two initial pools of knowledge approaches zero.

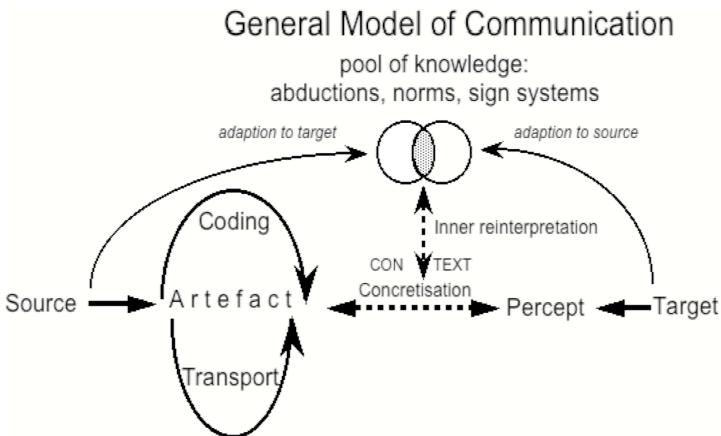


Figure 1. General model of communication.

It is important to recognize that, in a situation of communication, the first problem is not to find out *what* the message means: it is to realise that there *is* a message. That is, it involves the recognition of the message *as such* – as a message, rather than a message about something in particular. Even those theories of communication that insist on the act by means of which meaning is produced and conveyed – on the enunciation rather than the utterance – are not very clear about this issue. *Speech act theory* (Austin, Grice, Searle, etc.) separates the content of the message (“locution”) from how it is to be taken (“illocution”) and even the effect it may have or not have depending on circumstances (“perlocution”); but it is very vague about uptake: the necessity for the message to be attended to as such. In Jakobson’s (1960) model of communication, one of the functions

– called the *phatic function* – is supposed to assure that the message gets through; but Jakobson has very little to say about the way this is brought about, apart from giving the commonplace example of checking whether the telephone line is open by saying “hello”. Luis Prieto (1966) has been much more insistent on the difference between the message (“indice”) and the information that somebody is sending a message (“indication notificative”; cf. Sonesson 2012). But somehow the essential question gets lost in the discussion of intentions. After all, even an unintended message has to be recognized as such.

The first incommensurability problem thus concerns the recognition of the message *as* a message. Such recognition requires us to share some common presumptions about the shape of possible messages. This is nicely illustrated by the examples quoted by Vakoč (1999; 2003) of messages that a mathematician in the 1820s suggested could be formed by clearing massive stretches of Siberian forest to produce geometrical figures; and which others hoped to obtain by digging geometrically arranged channels in the Sahara to be filled with kerosene and set aflame during the night. Even if the Martians or inhabitants of the Moon could see these shapes and recognize them for what we think they are, they would only learn anything about us to the extent that they understood that these are messages sent by us – and, even more fundamentally, messages, period.

John R. Searle (1969) claims we can only see patterns in the desert sand as writing *if* we suppose somebody intended that we should understand somebody had the intention... etc. But the opposite is of course true: it is only *because* we see something as being (typically) writing that we suppose somebody had the intention... etc. If it is impossible that somebody was around, then, miraculously, God, some ghost, or ET must have been doing the writing (Sonesson, 1978). The astronomer Richard Hoagland says he has discovered in pictures taken of the planet Mars a sculpture of a monkey’s head, together with some other strange constructions, which must be traces of an ancient Martian civilization. For obvious reasons, other astronomers think this is as absurd as affirming that the man in the moon has been painted by intelligent beings (cf. Wikipedia contributors, 2013). However, what Hoagland presents us with is actually an iconic sign of another putatively iconic sign: i.e., a photograph of the monkey’s head. If his claim were borne out by direct observation, then we would have to admit that von Däniken’s space gods – with their superior technological resources – had landed on Mars and edified the monkey’s head, just so as to bewilder us (Däniken, 1973). This is parallel to a case considered by Arnheim: a prototypical picture should possess configurational and other holistic properties not found in ink blots that, in

their natural state, are all too irregular and, in their Roschach version, too symmetrical (Sonesson, 1989, pp. 254 f.: 2012; Arnheim, 1966, pp. 93 ff.).

In the end, what is needed are criteria for some shape being a message. One such criterion is no doubt *ruleboundedness*: regularity, repetition, etc.: that is, symbolicity in the Peircean sense. Simple examples are the cleared stretches of Siberian forest producing geometrical figures and the geometrically arranged channels in the Sahara lighted with kerosene. Interestingly, as we shall see, this is also what is found in some more complex proposals for extraterrestrial messages – e.g., Cros’ and the Nieman’s schemes, as well as Drake’s later proposal – in the first case, the same number for each line; in the second, “ $551 = 19 \times 29$ ” – though the same clue has to do service a second time as a signifier of “mathematicalness”. Another such criterion is similarity: that is, iconicity (but this may lead to projection, as in Hoagland’s monkey face and van Däniken’s wrist watches and helmets). Indexicality, on the other hand, as found e.g. in traces, could easily suggest no intention to communicate: that is, messages involuntarily produced.

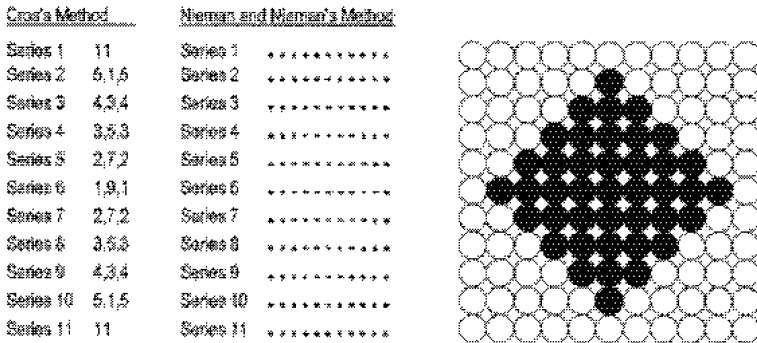


Figure 2. Cros’ and the Nieman’s method and the resulting picture according to Vakoch 1999 (reproduced with the permission of the author).

Interstellar communication projects into space problems long faced by archaeology in time. Thus, archaeologists are wont to ask: is the Berekhat Ram figure – an object dated to between 250,000–280,000 BP – the likeness of a woman? Before that another question must be posed: do the traces of abrasion left on it show regularity in a fashion suggesting “anthropogenic” movements? Although it has never been claimed to be a picture, Marschack’s “calendar” – if it were indeed a calendar: i.e., another kind of artefact with a cultural imprint – would have to evince some kind of

regularity in the very way its traces are disposed (Sonesson, 1994). Thus, we recognize the same interplay of iconicity, indexicality, and symbolcity as in interstellar messages. This brings us to the critique of iconicity.

### Disquisitions on Bierman's key

Writing the history of interstellar messages, Vakoch (1999; 2001; 2003) tells about some ingenious ways of constructing messages invented by Charles Cros in 1869, by the Niemans in 1920, and by Drake in the 1960s, the ideas of whom are quoted from Vakoch in the following (Figure 2). Cros suggested that several series of numbers should be sent out into space, each one having the same final sum. When the numbers were translated into strings of beads of two different colours and these strings were aligned one over the other, a figure would appear. According to the Niemans' proposal, dots and dashes would be used instead – again corresponding to beads of different colours, with the dots and dashes of each string making up the same sum. Drake's proposal is of the same general kind but more complex: the message sent consists of 551 bits of information, the only factors of which are 19 and 29. When these numbers are taken to be the length and width of the message, the result is a pixelated pattern, which could be interpreted to be a stocky biped placed beside the star and nine planets of our solar system, along with an oxygen and a carbon atom, with their electrons (Figure 3). The result of the reconstruction may be said to be of the same general kind as the better-known Pioneer plaque.

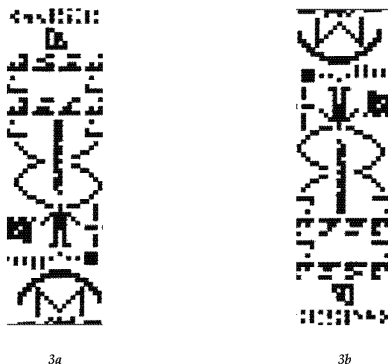


Figure 3. The result of constructing Drake's pictures (3a) according to Vakoch 1999 (reproduced with the permission of the author); and the same picture turned upside down (3b).

Of course, the idea is that, if these extraterrestrial beings are intelligent, they will be familiar with the same mathematics we are, and they will know the same chemistry (and also, as I will insist below, they will represent them the same way). Even granted that, however, these proposals beg the question: why would these hypothetical extraterrestrial scientists believe in the first place that these are messages – which is the primary requisite for setting out to reconstruct them. The only thing that may make such a scenario even remotely plausible is if ordinary perception is already a construction, as the constructionists maintain. But there is no reason to think so.

Although these codings are much more complicated, they remind me of a parable constructed by Arthur Bierman (1963, p. 249) with the purpose of proving the impossibility of iconicity. This story, I submit, is instructive in a different way than Bierman intended. A man receives by mail a parcel, which contains something the man takes to be a blueprint. Using pieces of metal, he sets about constructing a machine according to the blueprint; but when he switches it on, he is electrocuted. The next morning, his widow receives a letter, explaining that the figures marked on the paper must be cut out and put together, to obtain a paper machine. But is the moral of this story really that there are no iconic signs?

I think not. Like all activities taking place in the *Lifeworld*, i.e. the world taken for granted, the interpretation of pictures depends on certain things being taken for granted – but not necessarily on any particular conventions. “Normal” conditions are thought to obtain. When a sign differs from what might be expected, it is indeed necessary to have it “anchored” – to use the classical Barthesian term. When opening the parcel, the man will note a number of things: it contains iconical signs, rather than writing or scribbles, etc.; the particular style of the pictures connotes “blueprint”; the shapes given to the figures suggest that they depict machine parts. These observations determine the use to which the man puts the parcel: since it appears to be a blueprint, he sets about constructing something; since the shapes of the pictures suggest machine parts, and since machine parts are usually made of some sort of metal, he makes his construction out of metal. Apparently, there must also be some sign – probably iconic or indexical – that tells the man how to relate the pieces to each other. But Bierman has been pulling one over on the man. What seems to be a blueprint is really a cut-out sheet; instead of being pictures, the figures are identity signs; and what seem to be their borders are really indexical signs for where one must cut.

Interestingly, while instructions would be needed to discover that the sheet of paper could be seen as an identity sign – and thus a secondary



iconical sign, as we shall see below – none was necessary for the man to take it as a picture. If the sheet, considered as an expression, is ambiguous between two readings, then one of them – which happens to be incorrect here – would seem to suggest itself more readily. There is no hint in the story that the man put the pieces together incorrectly: thus, something was apparently read off from the picture iconically (and indexically). In this sense, Bierman's parable presupposes the truth of the very thesis it is supposed to disprove: that similarity, as such, can explain depiction. Not depiction, but the function of depiction, is at issue (Sonesson, 1989, pp. 220 ff.; 1998; 2000; 2001).

In our case, however, incommensurability is much greater. We have no reason to suppose the sender and the receiver of an interstellar message to share such understandings as permit the man in Bierman's story to make an interpretation, even if it happens to be the wrong one. Here it is true, in a much more acute sense, that normal conditions do *not* obtain. In fact, if depiction, on the face of it, stands at the beginning of Bierman's story, it only emerges as a result at the end of the coded messages aimed at extraterrestrials. This is, I think, a decisive difference.

Both Vakoch (1999) and Arbib (1979) locate the problem of the Drake message on the depiction end: the extraterrestrials would not be able to interpret it – they contend – if trying to read it upside down, with the legs of the biped pointing skywards. Arbib even proposes a possible – but obviously erroneous – interpretation of the inverted image. The philosopher Edmund Husserl (1980) long ago encountered the same problem, without having to take the perceptual habits of extraterrestrials into account: he suggested that pictures were essentially non-arbitrary, but that a convention was needed for telling us what was up and down. In a rejoinder to Husserl, I long ago refuted the last part of this affirmation: it is sufficient to turn a picture slowly around; at some point, the configuration giving rise to a depiction will emerge of itself. This is nicely illustrated by the comic strip *The Upside Downs*, created by G. Verbeek in 1903: at the end of each strip, you have to turn the entire strip on its head to follow the rest of the story. Thus, each drawing has a double interpretation, in which what was a hat may, after inversion, appear as a skirt, and so on. When you turn the figure around, not only does a new configuration (*Gestalt*) appear at some given point – but also a new representation. At least, so it is for human beings (Sonesson, 1989, pp. 220 ff.; 1998; 2000; 2001).

If extraterrestrials are like human beings, they will certainly not have more problems finding what is upside down in the picture than perceiving the picture as such. Nothing permits us to conclude, however, that extraterrestrials share the ecological world characteristic of human beings.

But this ignores the primary problem, which is anterior to the depiction: why should the extraterrestrials think there is any message at all?

### **The construction of the world – and its pictures**

As we have seen, the pictures making up the blueprint are really the givens in Bierman's story: it is the machine that is constructed in their image (or, as it happens, out of them). Bierman's formal arguments rather go to prove that pictures as such are constructs of our perception. As is well known, Nelson Goodman (1968) later on gave more famous formulation to those same arguments. The messages conceived by Cros, the Niemanns, and Drake are really better illustrations of this constructionist theory of picture perception than Bierman's story. Indeed, if human beings really have to construct each picture before perceiving it, then we may imagine the extraterrestrials doing the same once they have the proper instructions.

There is a parallel between the extant conceptions of picture perception and the psychological theories about our perception of the world. Three schools of perceptual psychology are commonly distinguished. The most venerable is known as constructivism and goes back to Helmholtz; but has, in recent times, most famously been represented by Gregory, who claims that impoverished stimuli can only give rise to percepts thanks to inferences or hypotheses. Gregory conceives these to be social constructs. As for the brand-new version of constructivism proposed by Hoffman (2004), it seems to abandon all tenets of the classical tradition and is hard to distinguish from ecological psychology, even though its formulation is very much steeped in constructionist language. It also seems to embrace the nativism otherwise characteristic of *Gestalt* psychology. According to the second school, *Gestalt* psychology – represented by Köhler, Koffka, Arnheim, etc. – innate mechanisms organise perception (based again on impoverished data) into configurations. Ecological psychology, which originates with the work of James Gibson, has been pursued (more or less adjusted) by Reed, Neisser, Kennedy, Hochberg, etc. According to it, the principles of “ecological physics” explain how percepts emerge from stimuli. Thus, it supposes human perception to be a function of the human ecological niche or *Umwelt*: that is – in phenomenological terms – of our *lifeworld* (Sonesson, 1989, pp. 255 ff.).

Psychologists have maintained that all three theories are descriptively inadequate: constructivism because no criteria have been proposed for when a hypothesis is confirmed; *Gestalt* psychology, because its laws are mysterious; and Gibsonianism, because no list of the invariants picked up from the environment can at present be given. Many psychologists – such

as Neisser and Hochberg – clearly think some combination of constructivism and ecological psychology would be more to the point. In our terms, ecological psychology may account for the general presuppositions of the human *Lifeworld*, while constructivism takes care of the things taken for granted in the various sociocultural *lifeworlds* (Sonesson, 1993, pp. 352 ff.).

Only ecological psychology seems to have anything relevant to say about pictures. The paradox of perceptual psychology is that ecological psychology is alone in attending to the difference between perceiving the real world and those signs of it called pictures. *Gestalt* psychology and constructivism often use pictorial examples – configurations and illusions, respectively – to illustrate real-world perception. Against this, Gibson (1978) claimed that no conclusion about the real world can be derived from pictorial examples. Although he never says so in as many words, Gibson clearly supposes the picture to be a sign. Indeed, he talks about pictures having referential meaning – as opposed to the “affordances” of perception. All animals can understand the meaning of surfaces. But according to Gibson, only human beings can interpret markings on a surface: that is, have indirect perceptions. If this is taken to mean seeing the markings as markings – and not as the real thing – Gibson may be right. The jury is still out on some primates having this capacity as well (Sonesson, 2009).

To see the picture as a picture clearly requires the capacity to perceive wholes (*Gestalts*) as such; to take contours to be equivalent to the sides of objects; and to accept the 2D surface as surrogate for a 3D world. The picture supposes a *similarity* on the background of a fundamental *difference*. But the problem may well be to see the difference rather than the similarity. Gibson (1978) observes that – besides conveying the invariants for the layout of the pictured surfaces – the picture must contain the invariants of the surface that 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. The difficulty, clearly, consists in seeing, at the same time, both the surface and the thing depicted (Sonesson, 1989, p. 251). There are indications that neither animals nor small children perceive the difference. Studies of picture perception in animals from doves to apes and in children do not distinguish the perception of the picture as a picture from the identification of another member of the category. But studies of self-recognition in mirrors – if, in spite of Eco (1999) the mirror is seen as a sign – indicate that apes, but not monkeys, can make the distinction.

According to Peirce, the sign – i.e., the expression – is something that “stands for that object not in all respects, but in reference to a sort of idea, which I sometimes called the ground of the representation” (Peirce, CP

2:228). In this sense, the “ground” is the point of view from which the expression represents the content. Elsewhere, it is said that the ground is an “abstraction”: for instance “the blackness of two black things” (Peirce, CP 1:293). In my interpretation, the ground is the moment in which iconicity becomes a relation: that is, in Peircean terms, a kind of Secondness. Like indexicality, which is already in itself a relation, it must be combined with the semiotic function to be turned into a sign. But – as we shall see – there are two ways in which this may happen to iconicity. Either similarity is a prerequisite for the sign, or the reverse.

### **Primary Iconicity in the Human Lifeworld**

The relative part played in a sign by iconicity and conventionality may be used to distinguish *primary* from *secondary iconicity*. A primary iconic sign is a sign if the perception of a similarity between an expression  $E$  and a content  $C$  is at least a partial reason for  $E$  being taken as the expression of a sign, the content of which is  $C$ . That is, iconicity is really the motivation (the ground) – or rather, one of the motivations – for positing the sign function. A secondary iconic sign on the other hand is a sign if our knowledge that  $E$  is the expression of a sign – the content of which is  $C$ , in some particular system of interpretation – is at least a partial reason for perceiving the similarity of  $E$  and  $C$ . Here, then, it is the sign relation that partially motivates the relationship of iconicity.

That pictures are instances of primary iconicity is shown by the child’s capacity for interpreting pictures when first confronted with them at 19 months of age, as demonstrated in Hochberg’s famous experiment; as well as by the ease with which pictures are employed by populations whose own culture ignores them – at least, so long as the culture in question is within the bounds of our own Earth. On the other hand, we *do* have to learn that – in certain situations, and according to particular conventions – objects that are normally used for what they are become signs – of themselves, of some of their properties, or of the class of which they form part: a car at a car exhibition, a stone axe in the museum showcase, a tin can in a shop window, an emperor’s impersonator when the emperor is away, and a urinal at an art exhibition (if it happens to be Duchamp’s “Fountain”). When Man Ray makes a picture of a billiard table, we need no convention to recognise what it depicts. However, if Sherrie Levine’s (real, three-dimensional) billiard table is to represent Man Ray’s picture, there must be a label inverting the hierarchy of prominence of the *Lifeworld*. This shows that – among the properties determining the probability of an object functioning as the expression of an iconic sign – is

to be found three-dimensionality, rather than the opposite.

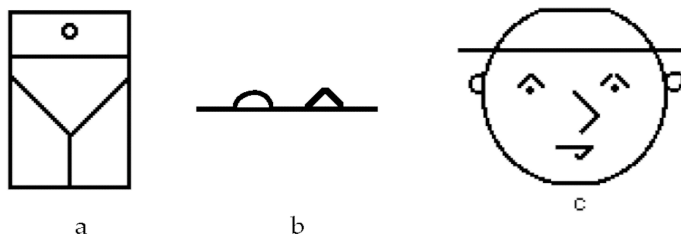


Figure 4. Two doodles and a picture which can be read as a doodle: a) Olive dropping into Martini glass or Close-up of girl in scanty bathing suit (from Arnheim as adapted in Sonesson 1989). b) Carracci's key (Mason behind wall); c) face or jar (inspired by Hermerén, 1983, p. 101).

One kind of picture is really a limiting case: the “doodle”, a picture that needs a key such as Carracci's mason behind a wall (Figure 4b). In one doodle, which I borrow from Arnheim (1969, pp. 92 f.), ambiguity is noted immediately in the title: “Olive dropping into martini glass or Close-up of girl in scanty bathing suit” (Figure 4a). While both scenes are possible to discover in the drawing, both are clearly underdetermined by it. There are two ways in which we can try to avoid such ambiguity. One is to fill in the details: in particular, the characteristic differences between an olive and a navel, the air and a pair of thighs, etc. At some point the doodle will then turn into a genuine picture. The other possibility – the only one considered by constructionists – is to introduce an explicit convention such as Carracci's key. According to Hermerén (1983, p. 101) it is only because of “the limitations of human imagination” that we see Figure 4c as a human face; for it can equally be perceived as “a jar from above, with some pebbles and broken matches on the bottom, and a stick placed across the opening”. All depends on what is meant by the limits of human imagination: *Gestalt* principles, the face as a privileged perceptual object, etc., all conspire to make one of the readings determinate. While it is possible to find the elements that Hermerén suggests should be in the picture, it is impossible to see the interpretation as a whole without being disturbed by the other reading. Thus, it seems that, when an expression has similarities to different contents or referents, one may be favoured because of properties of the expression itself and is not overwritten by convention. There may be objects like the human face that, because of the particular facts of human embodiment, are more easily recognizable than others.

## At Home in the Terrestrial Lifeworld

If our capacity to experience pictures directly – as opposed to secondary iconic signs – depends on the particular *Lifeworld* we are inhabiting: that is, on the ecology typical of human beings as it has evolved on Earth; then there is every reason to suspect that extraterrestrial beings, however intelligent, would not share this capacity with us. What are for us primary iconic signs would be secondary to them. While we function according to ecological psychology, they would have to follow the precepts of constructivism. No doubt there would be other phenomena that would be primary iconicities to them, but that we can only hope to interpret, if ever, according to the regime of secondary iconicity.

In the case of the biped in Drake's picture – once it is reconstructed as a picture – or the more explicit man and woman of the Pioneer plaque, the problem is not so much that the characteristic body shape of human beings must be recognized. Even in a normal picture, we can only recognize objects of the world with which we are already familiar – at least with their general type. Thus, if the extraterrestrials have different body shapes from ours and have never seen human beings, they obviously cannot recognize the human shape. The more general issue involves the possible embodiment of signs themselves. As I noted above, the faculty to interpret pictures at least presupposes the ability to perceive wholes as such, to take contours to be equivalent to the sides of objects, and to accept 2D forms as stand-ins for 3D objects. There is no particular reason to suppose this forms part of the ecology of extraterrestrial beings.

In a more general sense, these observations are also valid for markings, on a surface, that are *not* pictures. If our ability to interpret pictures is part of our competence as inhabitants of the human *Lifeworld*, then all other sign systems may well be dependent on the same particular ecological niche. Suppose that those people are right who think that our conception of mathematics, as well as our contemporary theories of physics, astronomy, and chemistry, must be known to extraterrestrial beings – either because they accept the same theories, or have entertained them at some earlier stage of their development (as we would recognize Newtonian physics with other intelligent beings). This would only be relevant to the content side of the sign. Even in the case of the natural sciences, the expression side of the signs is wholly within the limits of our human *Lifeworld*. Suppose that the extraterrestrials are well aware of hydrogen transitions, pulsars, and the layout of our solar system. It is still highly improbable for them to use the same surface markings to convey them to others as we would. Their *Lifeworld* would, most certainly, predispose them differently.

It is still possible that iconicity – in a wider sense than pictorality – may be of some help. Peirce pointed out that iconic signs convey more information than is contained in them; thus, “with two photographs you can make a map”. This property – which Greenlee called “exhibitive import” (Greenlee, 1973) – depends on our knowledge of the *Lifeworld*. Because of our familiarity with the layout of the *Lifeworld*, we are able to fill in the blanks in the representation. We can “see in” what we know should be there. If the extraterrestrials live in a different *Lifeworld* – as they most certainly do – they should be unable to derive any help from exhibitive import (cf. Sonesson, 1989, pp. 302 ff.).

Perhaps there is another type of iconic surplus: something we might call “introversive semiosis”, echoing a term used by Jakobson for signs referring to other signs rather than to the world. Peirce’s favoured examples of iconicity were mathematical expressions. Jakobson discovered an iconicity in grammar. Such projections of the selection axis onto the axes of combinations – using Jakobson’s phrase – is reminiscent of those messages with a regular structure that Arbib (1979) suggests should be used in communicating with extraterrestrials. More importantly, perhaps, what is needed are expressions that mirror the system character of the system. This might be feasible if there is what Deacon (2003) has called *semiotic constraints*: generalities of all conceivable semiotic systems. Of course, in keeping with earlier philosophers such as Husserl, Deacon is generalizing from the case of logic and mathematics to the less tightly organized system of verbal language (Sonesson, 2006; 2007). Are those generalizations really justified? Even if logic and mathematics are universal, do they not need to take on a special embodiment to be conveyed to us – one that is different from what any extraterrestrial may need?

In conclusion, we have seen that, although pictures are based on primary iconicity, this iconicity is relative to the peculiar human *Lifeworld*, which is most probably not shared by intelligent extraterrestrial beings; and that, although some more abstract kinds of iconicity may stand a greater chance of giving rise to universal messages, the very act of conveying them may require a form which is peculiar to the human *Lifeworld*.

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