Semiotic process implied in phenomena associated with high dilutions

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ABSTRACT

This article is an attempted sketch for a semiotic perspective about the HD phenomena, from their production, signification and meanings to possible fields of research. On the grounds of classic semiotic notions, it is proposed the model of “iconic transmission” which posits HD signs as icons. As a working hypothesis, it might be useful to explain the anomalous aspects of HD, which fall outside the scope of traditional science grounded on the notion of matter.

Keywords: High dilutions, Semiotics, Signs; Signals, Icons

Introduction

The phenomena associated with high dilutions (HD) cannot be explained on a molecular basis for the very simple reason that above Avogadro’s limit (6.022×10^{23}) there are not any more molecules. However, evidence coming from clinical studies, veterinary medicine, experimental models and botanic studies indicate that the HD phenomenon exists [1-3], even when it can be considered a “strange” phenomenon due to our current inability to explain it. It is characteristic of science, when exceptions to rules become too remarkable, to revise the rules themselves. This is how science advances, i.e. by opening new perspectives and even new views on reality.

The first question then to ask is: if there are no molecules to explain the HD phenomenon, then what is it? Since the currently sanctioned theories on the working of matter cannot give an account of it, new venues need to be pursued and one of such is the “theory of body signifiers” proposed by Bastide and Lagache [4-8]. I would like to stress what I hold to be the three main features of this theory: it is systemic, semiotic and informational. Systemic, in the sense that living beings are seen as organized, complex and multi-layered systems in permanent exchange with the environment, while acting and reacting as whole units. Semiotic, because the main means to provoke responses are signs (stimuli, signals) that the body recognizes at different levels. Informational, because the full interplay involves conveying information. Shortly, it can be said that the theory of body signifiers is a general framework for studies, which opens new perspectives in biological research, aiming at explaining living beings in a semantic manner, in other words, all influences, even the infinitesimal ones, have potential meaning within a responsive system.

What I propose to do here is to look closer into the HD phenomenon by approaching it as a **semiotic process**, generating meanings and actions through signs, and attempting to describe different layers of semiosis and their specificity.

Short outline of some semiotic notions

Modern semiotics, i.e. the science of signs, has two roots: a European one, known as “semiology”, grounded on a linguistic tradition launched by Ferdinand de Saussure (1857-1913) [9] and an American one, “semiotic”, inaugurated at about the same time by Charles S. Peirce (1839-1914), resulting from a thorough revision of Western ontology (the science of being) and logic (the science of properly thinking) [10]. Peirce, thus, needed also to elaborate a new vocabulary, as required by also a new science. For example, he defined “sign” as a **necessary triadic relation between an object, a representamen and an interpretant** [CP 2.228].

The **representamen** is something that **stands to** somebody **for** something else in some respect or capacity. This is to say, it **addresses someone** and creates in the mind of that person an equivalent or more developed sign. The second sign thus created is the **interpretant** of the first one, and the “something” the sign **stands for** it is its object.

Therefore, signs are not a class of things, but exist only in relation with a process of signification: “nothing is a sign unless it is interpreted as a sign” [CP 2.308]. This process Peirce called **semiosis** (or *semeiosis*) and the discipline which deals with such processes, *semiotic*, i.e. “the doctrine of the essential nature and fundamental varieties of possible semiosis” [CP 5. 488]. Let us see closer to each of the three (triadic) components of the sign.

The *representamen* is “the perceptible thing” functioning as a sign; other semioticians named it in other ways as, e. g., *sign vehicle* (Morris)[11], *signifier* (Saussure)[9], *expression* (Hjelmslev)[12], etc.

The *object* is that something which the sign represents. The object is not necessary an external material thing, but it can be anything that is somehow represented: a material thing, a class of things, or (as we will see in HD) a substance, etc. It was named also *denotatum* (Morris), *referent* (Hjelmslev), *signified* (Saussure), etc.

The *interpretant* is, to Peirce, “the proper significance outcome” or “the effect of the sign” [CP 5.474-75]; it is “an equivalent sign or perhaps a more developed sign” created in the mind of those whom the sign addresses, and is able to give rise to another chain of semiosis, so that as an act, we deal with an unlimited semiosis, because of “the series of successive interpretants” extends *ad infinitum* [CP 2.228].

At the same time, Peirce also redefined the categories of being (ontology), for the first time in the Western tradition since Aristotle, and posited three basic ones: **Firstness**, or “the mode of being of that such as it is, positively and without reference to anything else [CP 8.328]; **Secondness**, which involves the relation of a “first” to a “second”, i.e. “it meets us in such facts as another, relation, compulsion, effect, dependence, independence, negation, occurrence, reality, result” [CP 1.356-59]; and **Thirdness** is the category of mediation, which relates to two first categories and brings “habit, memory, continuity, synthesis, communication (semiosis), representations and signs” [13].

Following these categories, there also are three kinds of interpretants: 1) the **immediate** interpretant, corresponding to the category of Firstness and defined as “the Quality of the Impression that a sign is fit to produce, not any actual impression”; thus it is related with potentiality; 2) the **dynamical** interpretant, “**direct effect** actually produced by a Sign upon an Interpreter”, related with the category of Secondness; and 3) the **final** interpretant, which is related with a true interpretation, from where a habit or a law comes out, corresponding to the category of Thirdness.

Charles William Morris (1901-1979) expanded the field of semiosis while aiming at developing a science of signs “on a biological basis and specifically within the framework of the science of behavior” [14]. In this context, semiotics is not just one science among others but also an instrument of the sciences. For Morris, the three components of semiosis are the **sign vehicle** (“that which acts as a sign”), the **designatum** (“that which the signs refers to”) and the **interpretant** (“the effect on some interpreter in virtue of which the thing in

question is a sign to that interpreter”). One important concept by Morris is that a sign is “something that directs behavior with respect to something that is not at the time a stimulus” [14].

Morris defined three dimensions of semiotics: 1) **syntactic** - that studies the formal relations inside the components of signs and their relations in articulations ; 2) **semantic** – the relation of the sign vehicle with its designates or the meanings of signs; 3) **pragmatic** – the relation between signs and the interpreters or effects .

Semiosis is, thus, in his view a process of mediation, “a sign is used with respect to some goal if it is produced by an interpreter as a means of attaining that goal: a sign that is used thus is a means-object” [14], signs are in this way mediators, and “semiosis is a mediated-taking-account-of”.

Focusing on the pragmatic aspect of semiosis, Morris defines four dimensions of sign use: 1) **informative** – when the sign is used to inform about something; 2) **valuative** - when the sign is intended to add a selection of objects; 3) **incitive** – when it incites response sequences, 4) **systemic** - when it organizes sign-produced behavior into a determinate whole.

Summarizing some misconceptions about signs, Winfried Nöth [13] makes three precise distinctions: 1) The sign is not a sign vehicle; 2) The sign is not a sign element; 3) The sign is not a physical signal.

Another author who brought important contributions to semiotics was Roman Jakobson (1896-1982), who established the famous scheme of communication as a mediation process by messages (signs) between a sender and a receiver within a given context and through the use of codes (Figure 1).

Figure 1. Jakobson's scheme of communication

Clinical use of HD as semiotic processes

In HD phenomena, a remarkable fact is their application in medicine for more than 200 years, with countless reports on positive results [15]. However, it must be stressed that from the standpoint of a general theory of HD, homeopathy is just one application, namely **the clinical use of HD**; there are further instances of clinical use of HD as, e.g. isotherapy.

In this regard, experience shows that not any HD of any original substance (substrate) works in different pathological conditions: for the same disease, different medicines proved to act therapeutically in different patients and, conversely, many medicines seemingly useful for one same patient, proved unsuccessful in practice. This points to a **specificity** of response based on well defined criteria, a relation between a certain medicine (and no other) and a patient in a given state. In traditional terms, the role of the homeopathic physician is to search for the more “striking, singular, uncommon and peculiar (characteristic) signs and

symptoms” [16, §153] of the patient, i.e., to discover a specific “susceptibility” of response to the chosen remedy.

The way the homeopathic physician follows is a **semiotic** way: 1) he or she searches for specific **signs** in the patient; 2) then, he or she compares the signs of the patient with the **signs** recorded in the homeopathic materia medica – the outcome of the effects of substances on healthy individuals; 3) and finally looks for the “similarity” between the two series or configurations of signs; 4) by the same token, also the results of treatment are evaluated according to the “signs of evolution” of patients.

Basically, what the physician does is to compare two configurations of signs, two “images”, through similarity (Figure 2):

Figure 2: Comparisons of signs or “images”.

In semiotic terms, this corresponds to a comparison of two images, therefore it involves an **iconic process**. An **icon** according to Peirce is “a quality that it has *qua* thing renders it fit to be a representamen” [CP 2.276], “a sign by *Firstness* is an image of its object” [CP 2.276], the main quality of icons is the similarity in some aspects and some context of something to an interpreter. On the other hand, an index is a sign that “points to” the referent as a weathercock wind does; an index is a sign that shows a connection that leads to the referent. Finally, **symbols**, according to Peirce, are the category of arbitrary or conventional signs, as words, mathematical symbols, etc. [CP 2. 449].

Now, the question is whether there are only icons in this sign-process? When collecting the signs and symptoms of the patient, the physician, in fact, uses all three main categories of signs: 1) indexes (like the gestures that indicate the location of pain, or the rise of the temperature in a thermometer); 2) icons (as e.g. the aspect of lesions on the skin or image diagnostics data); 3) symbols (all verbal signs, known as symptoms, all the numbers of laboratory findings, etc.).

All these **clinical signs** [S(c)] are laced together in a configuration to create an image of the state of the patient, this is to say, they **mediate** between this state which is the **referent** (R) and the physician, who acts as an **interpreter** (I). The process as a whole is one of **signification** (in its original sense: *significatio*).

But the process does not end here, it goes further. The physician chooses a HD medicine, prescribes it to the patient, the patient responds (in one way or another) by modifying his or her state and thus presents new signs, which are interpreted anew during the follow up consultation. A new medicine or a new dilution or the same is prescribed, or none at all, and so on. The process of communication evolves in stages, whereas it is

fully carried out through signs. As a fact, ***the medicine itself is a sign*** [S(hd)] in this communication context since it initiates a response and is used with the intention to elicit a response:

Thus, there is here a chain of changing roles between the sender and receiver. In the beginning, the patient acts as sender (of clinical signs) and the physician as the receiver; then the latter acts as sender (by means of a HD medicine) and the patient as the receiver; the process goes on until a desired result of communication is achieved.

Provings as sign-generating processes

“Proving”, or homeopathic pathogenetic trial (HPT), is the name given in homeopathy to the testing of the effects of potentially therapeutic substances on healthy human beings. In ***voluntary*** provings, an attenuated substance (HD) is given experimentally to a cohort of individuals (presumed to be healthy), and the resulting symptoms and signs are recorded. In ***involuntary*** provings, the substance is taken by accident (intoxications, poisonings or other diverse reactions) and recorded by different professionals.

Provings determine certain reactions in the experimental subjects. When observed or recorded, these reactions are ***signs*** of the modification of the state of subjects, either by direct observation of the subjects themselves, by physicians or toxicologists, or they can be instrumentally mediated (laboratory, image diagnostics, etc.), showing the modification of some parameters. Subjective modifications reported in a verbal way are called symptoms (verbal ***signs***). The observed signs of provings are recorded (a second signification by symbolization) in toxicological reports or the homeopathic materia medica. Provings are, thus, sign-generating processes, which give rise to ***configurations of signs*** (“the image” of effects of the substance); by ***interpreting*** them, homeopathic physicians are able to recognize the possible ***referent*** (the inductor substance) and initiate a therapeutic action.

A proved substance may elicit many different signs in different individuals. The configuration of signs plays a semiotic role: it is an “image” that displays an ***iconographic*** mode of recognition (terminologically, the descriptions that lead to the formation of an image in the receiver are icons themselves). However, there are more layers of semiosis in provings: 1) The signs as elicited by the substances are indexes, which may “point to” the substance; 2) The records of signs are symbols; 3) The configuration of signs (“image”) is iconic.

The first ***referent*** (object) to which the “image” refers is the ***substance*** (e.g. mercury) in a given ***context*** (on humans, animals, plants, the environment, etc.). In homeopathic jargon, it is not rare to find expressions such as “the patient presented a clear *Mercurius* picture”; this refers to a double iconic interpretation - the patient’s signs and the proving signs - where the referent is the same, namely *Mercurius*.

Dilutions interpreted semiotically

Very complicated things sometimes become simple if only we describe them well. What are HD? If we name “substrate” the substance that is attenuated, and “dilution” the ratio (R) in which it is dissolved in another substance, the general formula of dilutions is:

$$S_{i+1} = \frac{S_i}{c M} \quad (i \geq 0)$$

where “ S_i ” is the starting substrate amount, “ c ” is the scale (as e.g., 10 in decimal, 100 in centesimal and 50,000 in LM homeopathic preparations) and “ M ” is the medium used as solvent. To obtain the successive HD, the process is repeated several times always in the same manner, so that:

$$\frac{S_0}{c M} = S_1; \quad \frac{S_1}{c M} = S_2; \quad \frac{S_2}{c M} = S_3; \quad \dots \quad \frac{S_{n-1}}{c M} = S_n$$

It is immediately evident that the factor ($c M$) remains constant, whereas the only variable is “ S_i ”. From a material point of view, “ S_i ” changes, in the sense that it is quantitatively attenuated by the dispersion in the solvent medium. To illustrate this idea:

$$S_0 \quad S_1 \quad S_2 \quad S_3 \quad \dots \quad S_n$$

But this is not the case from a semiotic point of view: since “ S ” is a sign, it remains constant and the variation is in the sign-vehicle:

$$S \quad \{ 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad \dots \quad n \}$$

A trivial example might help understanding this better. Figure 3 is an **icon**: an **image** of “Che Guevara”, it “stands for” Che Guevara “to” all who can recognize it as such.

The fact that the **sign vehicle** changes, as in Figure 4, does not change in the least the sign-status of the image:

Figure 3: Image of Che Guevara

Figure 4: Different supports for the same sign.

The image itself becomes a sign only if somebody can perceive it and signify it “as” the image of Che Guevara, if somebody recognizes it and reacts to it (as a social or emotional symbol), otherwise it will be just the image of a bearded man wearing a beret. The carrier of significance is the image itself if addressed to sensitive people, not the material where it is printed or projected. If we would take samples of the lighter, the t-shirt or from a screen where the image is projected, nothing will come about the signification of the image. On different supports of different shapes and materials, an icon remains an icon by being a signifying image to somebody.

HD phenomena as semiotic processes

Now, the question is: can we consider a HD (S_n) as a sign? The answer is affirmative from a double perspective: 1) the ***purpose*** of the process; and 2) the ***process itself***.

When we consider the purpose of the process, we can say that the goal of preparing a HD is to give it or ***address*** it to somebody or something, i.e., the finality is to change the state or behavior of some ***receiver*** to which it is given, or to test the response of such receiver. Receivers play the role of interpretants if they react in a way or another to the HD, which acts as a sign when it is able to elicit some change. As such, there is a clear ***intentionality*** in each use of HD as in every communication act, be it clinical (as in homeopathy) or experimental. This process, it must be stressed, is not a mere action-reaction, but a ***mediating process*** through the means of HD, which act as signs when they are interpreted by receivers.

For a receiver to respond to HD, it is necessary that the specific HD has a ***meaning*** for it; it needs to “understand” the message and be able to interpret it. To remind, the message is not conveyed by the raw substrate itself, but by something which is 1) a sign of it; and 2) a sign for the receiver itself.

The receiver may be a biological system of any kind or level of organization: micro-organisms, cells, tissues, plants, animals, human beings, but also non-biological systems, as, e.g. in the experiments of thermoluminescence [15]. In both cases, however, a basic distinction is needed between the notions of: 1) ***interpretant***, which is the system that receives signs, reacts in a way or another, and is a part of the semiosis that makes HD a sign; and 2) the ***interpreters*** of laboratory or clinical researches, which in turn may be of two kinds, instrumental and human. If a non biological system reacts by modifying a parameter (e.g., thermoluminescence), then the system itself is a dynamic interpretant, but what is actually seen (and interpreted) are graphical representations or numbers that a machine produces. These graphics become signs for the changes: the images we perceive in our mind are the final interpretant, whereas the researcher is the final interpreter. The interpreting process is one where a signification or a meaning occurs to somebody or something in relation with the representamen or sign that stands for something else.

HD as iconic signs

If we interpret HD as signs, the question is: what kind of signs are they? Are they indexes, icons or symbols? We will answer this question by giving an example.

When somebody eats berries of Belladonna (*Atropa belladonna* L.) in a given amount, he or she will exhibit signs of atropine intoxication: mydriasis, dryness of skin and mucous tissues, etc. The same effect is seen when the plant is triturated or an extract of it is made and some quantity is ingested. In either way, Belladonna provokes the same effects on the organism, which can be observed and described as signs of Belladonna intoxication.

In semiotic terms, a configuration of signs emerges, which represents “the image” of the action of Belladonna on human beings. If we further make a spectroscopic analysis of the tincture of Belladonna, we will obtain another image, a graphic produced by the instrument, which can be interpreted by a specialist. The main point here is that both images are configuration of signs ***mediated*** by a third, the instrument or the human

system making a specific interpretation at the end of the process. In both cases we do not longer deal with the plant itself, which is the primary referent, or the subject of testing, but with an outcome of its action on something or somebody who may interpret it.

What does the plant have in common with the tincture? The bottle on which is written “belladonna” for sure is not the same with the plant, but something that some, as e.g. a pharmacist considers to “stand for” the plant (Figure 5).

Figure 5: Belladonna: the plant and a bottle.

There are two levels of semiotic transmission that place the pharmacy vessel in continuity with the actual plant in spite of the seemingly gross differences. First, they share the same name, i.e. one same symbol is used (the name) in both cases, and this for a definite reason: the vessel supposedly contains an extract of the plant. But further on, there is also the level of “the image” of the signs produced by the use of both plant and extract or tincture, which is the same. Therefore, here one deals with **iconicity**, arising from the continuity in the response (signs) both provoke on the receivers.

As a fact, if Belladonna (the plant) is considered as the referent, the extract or tincture is already a sign of it, and from the semiotic perspective, they both act in the same way. It is as if in the extract or tincture there would be a “chemical image” of belladonna under very well-defined conditions, namely, its effect on a sensitive interpreter. In the latter regard it must be noticed that Belladonna does not provoke universal effects, as shown by some species of birds that are not sensitive after the intake of berries. Coming back to the semiotic discussion, the case above does not refer to icons in their usual visual meaning, but to a kind of chemical **similarity** and **continuity** between the plant and the extract or tincture that allows one describing the latter as an **icon** of the first in some regard, viz. human physiology, in this case.

It might be naturally objected that the effects of both plant and extract or tincture are due to their content in active principles, alkaloids, so that the “chemical image” can be disclosed through chemical analysis or inferred from its physiological effects. However in either human body or chemical instrument, it is also semiotically legitimate to refer to the iconic image of the effects resulting from the interaction belladonna-sensitive receiver indifferent from the sign-vehicle.

The same applies to any extract or tincture of any substance diluted in any medium with which it is compatible. The medium is not important *per se* but only in its relation with the substance, in other words, it has to “receive it” as a carrier and be able to transmit it further, as a sign-vehicle for an interpreter, either biological or not, under certain conditions which are **semiotic conditions**: the receiver must be able to interpret the sign.

To summarise, it can be hypothesized *that in the field of HD one does not deal with processes of material transmission but of semiotic transmission*. No matter how much an extract or tincture is diluted, one and the same process is once and again repeated: the image of the biological effects of a substance is conveyed from one medium to another in a semiotic manner, viz. a process of **iconic transmission**. At each process of the dilution, the medium changes, but the icon is kept, always referring to the same referent, able to be interpreted by a sensitive system. Even when diluting diminishes the shape and quantity of the sign, it does not affect its semiotic function if there is a sensitive receptor system fit to perceive it.

Naturally, at this stage, it is an initial hypothesis, and as such a very daring one, as it requires leaving completely aside all traditional scientific thinking centered on the notion of matter (“substance”, in Aristotle’s terms), and shifting to a full different ontological and logical framework, which has the category of mediation as its very core, as it is the semiotic model. On the other hand, it can prove to possess high heuristic value for the design of new experimental models on HD more fitting to its alleged “anomalous” features.

Sintactics, semantics and pragmatics of HD

If we consider HD as a full semiotic system we can trace its domains of research by using Morris’ triple division of semiotics.

Syntactic research deals with intra-sign relations, involving all processes and relations that make something be a sign, and with the way signs articulate one with another to generate messages. In the case of HD research, this refers to all experiences dealing with the factors that make HD act as signs, the relations that constitute HD as means to transmit information: the relations between HD and different media (solid, liquid, etc.); the relations between substrate and HD (e.g., iconic transmission); the problem simple diluting versus diluting + agitating, etc.

The aims of this discipline, and the research from the syntactic perspective, would be to find what the elementary units of HD as signs are, e.g., the relation with water or other media, what the rules to make HD signs are, as in the problem of dilution/agitation, the rate of dilution, the proportions for optimizing the transmission of signs from one level of HD to the following one, etc.; and what can the rules and laws be of what might be called the “HD language”.

Semantic research deals with the signification and meaning of signs within the context of communication. In the case of HD, semantic research refers to: how a system recognizes HD; how a system becomes receptive to HD; how a system interprets HD in different conditions and what such conditions are; what kind of instruments and models we need to interpret HD meanings.

The aim of this area of research is to study the way HD become significant to other systems, how other systems “recognize” them as signs, how the process of interpretation take place.

Pragmatics refers to the effect of sign transmission and communication and its consequences. Regarding HD, this dimension can generate research to establish: what the effects of HD in different (biological and non biological) levels are; how systems react to HD, in what conditions and manners; what the use of HD in sciences and different fields can be; what the costs and benefits of the use of HD in different fields are. Clinical researches as well as experimental researches on human beings, animals or plants belong to this category, as well as the economical or sociological ones (as, eg. the improvement in quality of live studies, or the cost-benefit studies when using HD)

Instead of conclusion

This article is an attempt to sketch a semiotic perspective about the HD phenomena, from their production, signification and meanings to the possible fields of research. The “iconic transmission” model here proposed is

a hypothesis that might be useful to explain the strange phenomena of HD, which cannot be accurately and satisfactorily explained by other theories and seems to have a wider scope than the pure physical ones. Why and how HD may constitute signs and act as signs in processes of communication must still be clarified. The scheme of semiotic fields (syntactic, semantic, pragmatic) might help in the design in a more coherent way the whole spectrum of researches and integrate the facts already achieved, as well as it may open the way for new models of understanding HD.

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Processos semióticos implícitos nos fenômenos associados às Altas Diluições.

RESUMO

Este artigo é uma tentativa de esboçar, a partir de uma perspectiva semiótica, o fenômeno das Altas Diluições, desde a produção de uma HD até a conceituação de possíveis campos de pesquisa. A partir de noções semióticas clássicas é proposto um modelo de "transmissão icônica" postulando os sinais de uma HD como um ícone. Como hipótese de trabalho, este poderia ser útil para explicar aspectos anômalos de uma HD, os quais situam-se fora do escopo da tradicional noção de matéria.

Palavras-chaves: Altas Diluições, Semiótica, Sinais, Signos, Ícones.

Procesos semióticos involucrados en los fenómenos asociados a altas diluciones

RESUMEN

Este artículo es un esbozo, desde una perspectiva semiótica, del fenómeno de altas diluciones, desde su producción, su significado, a los significados de los posibles campos de investigación. Encuadrados en conceptos semióticos clásicos, se propone el modelo de "transmisión icónica" que postula las señales de una alta dilución como iconos. Como hipótesis de trabajo, podría ser útil para explicar los diferentes aspectos de las altas diluciones, que quedan fuera del ámbito de aplicación de la ciencia tradicional enmarcados en la noción de materia.

Palabras claves: altas diluciones, semiótica, signos, señales, iconos

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