Science and literature:
the world(s) of representations

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We have shaped our world as a world of pairs of opposites. Maybe under the influence of our own instincts and perceptions of some pairs we look at as "natural" (day-night, light-darkness, good-evil, life-death), we organize knowledge with similar criteria, building a world of *hard* and *soft* sciences, in which even knowledge and education have been divided. We have sciences and humanities, and these structures have determined the way in which we understand the world, our lives, our professions and our perceptions. Even when we do not want to do it intentionally, it is very hard to us not to think in terms of true/false, objectivity/subjectivity, real/fake. And even when sciences and humanities have reached high theoretical levels in which this scheme of things has been brought into question, we still look at our world this way. Maybe it is because of the fact that this way of seeing draws neat borders to our frames of mind, and gives us a sense of safety.

Additionally, inside each pair, one of the terms gives us the higher sense of confidence. If we ask someone about his/her preferences, or about which one is "better", we will find a dominant side: that one related to the notions of good, truth, objectivity … These words inspire confidence. We have developed the tradition of trusting legitimated fields: history, science, press (even when press disappoints us everyday all over the world). Western culture is materially and metaphorically visual and believes in "proofs", and many of our languages have words that relate the idea of proofs to our sight, like *evidence*. But vision stimulates imagination too fast, and we forget that what we see is not what we get: Gombrich asks: «Who would like to hear that *La Gioconda* is only a pigmented table and that we must imagine that there is a woman?»[1]. We trust our eyes. There is a woman. But no. There is a pigmented surface. An aesthetic achievement. And and there is a woman. And there are both, and none of them, in a certain way.

We learn to develop confidence in others: we find that some people (or systems, or languages) are dependable. When we say that something has been scientifically proved, or tested, we (as a species) seem to believe

as if we had seen the proof with our own eyes. When we hear about the perspectives of a poet or an artist, we may admire him/her, but we usually imagine his/her world as a unique universe, not scientifically proved, exclusive, subjective and far (and free) from the world of truth or reality. But how do we communicate with his/her work, how do we experience it?

I am in a space, I am at a time. The signs I use when I point to the things around myself have to do with my *here and now*. The ideas of past, future, close and far are defined by my own co-ordinates. And the evolution of human beings about our consciousness of being centers of reference is important when we look at the story of humanity, as well as when we look at our own stories from our birth through all our life. In her works about deixis and anaphora, Anne Zribi-Hertz[2] tries to demonstrate that languages develop from their own pointing devices to become more and more grammaticalized: we start adjusting our pointing resources towards the inner side of language, where we can organize relationships between/among absent entities. As far as we do this, the spaces and times we perceive are not only located in an external frame, but also in the world of introspection, imagination and discourse. Therefore, the growth of complex thought in any human activity or discipline is a displacement from signals starting in ourselves to a discourse system in which we pretend to travel from ourselves to the others, to the otherness, and even to the other and the otherness we can find inside ourselves. Hence, deixis is not only a pointing mechanism: it is the starting point to more and more complex discourses. And when we realize that our main (vital) spaces are not only perceived through the senses, but are also spaces of evocation, imagination, or inner exploration, we start to organize our linguistic resources to build spacetimes. We all are creators of possible worlds: according to Berger and Luckmann, «even when "talking to myself" in solitary thought, an entire world can be appresented to me at any moment»[3].

When we talk about this displacement from deixis to grammaticalization, this does not mean that primary deixis is like a disposable napkin or glass. It means that our promenades through our worlds of discourse are permanently growing in complexity. Yes, we still show a corner with our finger when someone ask us for directions. We still understand our history with the reference of our birth date or our first day in college. It means that, in the same way we keep alive the notion of a sun rising and setting along with the formal knowledge about the Earth moving, we can accept and develop other "contradictions", learning that we must contextualize them as processes that come from different frames of reference, frames that can perfectly live together, sometimes. A good example of this kind of situation is the one proposed by Meyrowitz regarding the growth of communications and technology:

The terms "print society" and "electronic-society" are simply shorthand descriptions for a complex interaction among means of communication. A "print society" is actually an oral-writing-print society; an "electronic society" is actually an oral-writing-print-electronic society. The shortened labels merely emphasize the latest significant development to have caused shifts in the rest of the communication spectrum.

In many ways, it is a fiction to discuss any one medium or type of medium in isolation. Media interact with each other within what might be called the *media matrix* – the interlocking network of all coexistent media[4].

Human societies suffer some changes and uncomfortable situations when new media appear in scene. Some people reject the relevance of a new medium. Others seem to believe that this new medium is the one and only. The complexity of human realities is so big that, even when we have (and we need to have it) a deictical center, we must be able to move dynamically between worlds. We do have a paramount reality, but it is not our only reality. Berger and Luckmann state that «Consciousness always return to the paramount reality as from an excursion. This is evident […] in the reality of dreams or that of theoretical thought»[5]. We construct worlds through language.

What about science? Bruce Gregory, in his book *Inventing Reality: Physics as Language*, observes:

There is a sense in which no one, including philosophers, doubts the existence of a real objective world. The stubbornly physical nature of the world we encounter every day is obvious. *The minute we begin to talk about this world, however, it somehow becomes transformed into another world, an interpreted world, a world delimited by language* – a world of trees, houses, cars, quarks, and leptons. In order to deal with the world, we have to talk about it (or measure it, or shape it – in any case we engage the world in terms of our symbols …[6]

Here we see that also physical sciences are looking at the idea of reality as an idea that depends on conceptualization and language. Since we start representing what we see or what we think in pictures, numbers or words, we are talking about constructions, not about the universe *as is.* And this is part of the above (Zribi-Hertz) theory about the evolvement from deixis to anaphora, from simply pointing devices to complex ones. As if we were human fractal or holographic images, we do this from childhood to adulthood, reflecting the growth (and the problematization) of our civilization.

Hejl observes that sign systems «can be utilized as instruments with only one condition: that the society had previously developed the abilities needed to co-ordinate their meanings»[7]. Part of this "co-ordination

of meanings" has to do with knowledge, preconceptions, including prejudice. To understand contemporary poetry or narrative has to do with the development of certain reading strategies. To enjoy contemporary art has to do with a sort of eye and sensibility training. We develop horizons of expectations, and we have coordinated the meanings of phrases such as "this has been scientifically proved" to accept them as truth. Nevertheless, scientific and literary "truths" are not static. They should be always written, at least in our minds, with the consciousness of quotation marks.

We co-ordinate meanings to believe in science as "truth" or "fact", and we accept literature as "fantasy", "fiction", and even "feeling". Our usual co-ordination of meanings is closely related to our construction of pairs of opposites. Thomas Pavel points out that the production of truth underlies historically in the axis of every narrative/fictional project and that literary fiction started as a project about truth, devoted to record memorable facts, and to assign verisimilitude to a human conglomerate of myths[8]. According to this author, myths and legends have a deep sense of exemplary human truths behind heroes, gods and fantastic creatures. In the case of poetry, Carlos Bousoño states that poetic constructions are made to achieve acceptation and poetic images are intended to be somehow "recognized" by us, like when we read or hear something that is, in fact, strange or unusual but, despite this, we find it curiously precise and convincing, like a *theorem*[9]. I would like to illustrate this poetic "truth" through some examples. Here is the end of a poem by Rafael Cadenas about the moment of waking up. The three last verses say: «the cup of coffee / before going to the street / when I am not with myself yet»[10]. Vicente Gerbasi describes a scene of storm and the text ends with this: «The soul, with the thunder, resounds like a cellar of the sky»[11]. Venezuelan poet Luis Barrios Cruz wrote the following definition: «The cicada / is a dry leaf / singing»[12]. Or when T. S. Eliot wrote: «I do not know much about gods; but I think that the river / is a strong brown god: sullen, untamed and intractable»[13]. Poetic images, as Pierre Reverdy said once, have not to be brutal or fantastic, but distant and accurate[14]. Literary truth brings to us the "reality" of love, horror, chaos, death, madness by means of the "unreality" of characters, places, fantasy and fiction. These simulations are not so far from the simulated environment of experimental science. Philippe Roqueplo, quoting Baudouin Jourdant, remarks:

[…] Baudouin Jourdant poses the following questions: "What does science represent? What is scientificity?" And he replies: "It is mainly another place and another time".

Another place: the lab, the University, the research center; concrete, mysterious and secret places, located in the spaces of daily life […]. The laboratory is the

place in which the production of truth takes place, and, as such place, it becomes a kind of mythical space[15].

Simulations in labs are semiotic and dialogic processes. When we develop a consciousness of this condition, we have to recognize that, as David Locke claims, both science and literature are essentially interpretative, hermeneutic execises[16]. From this we can understand that this idea of the "production of truth" is related to the reconstruction of a series of conditions of reference to simulate the space and time of a particular portion of the world. The quest for truth has a wide diversity of approaches and a diversity of readings as well. As Heinz Pagels affirms, there is a value of evolution survival in the fact of representing the world by means of myths, metaphors and scientific theories[17]. According to Locke, scientists and writers translate the world into metaphors, and this includes judgement, know-how, sensibility and tradition in both cases. This includes the mythological names of constellations and the etymology of the names of chemical elements in the periodic table.

«The scientific method does not have an intrinsic condition that establish that people stop being people when they become scientists»[18]. To simulate, in fiction, and in the lab, is an action directed to grab something, to make this something ours. If we put this in the simple terms of real/unreal, we have to say that it is not very "real" or objective to pretend that some things (landscapes, situations, creatures, etc.) are here and now just because we organize a simulated (linguistic or factual) environment in which it looks as if they were here and now. Or, at least, we would have to recognize that this "as if" expression is a *trademark* of fiction.

The ability of representation and transportation between the "here and now" of different possible worlds to the language and syntax of the *here and now* of man seems to be a human attribute. Berger and Luckmann wrote that this capacity to transcend the here and now makes language able to "bridge different zones within the reality of everyday life and integrates them into a meaningful whole", to synchronize different biographical times, to converse about absent individual and collectives, to "make present a variety of objects that are spatially, temporally and socially absent from the here and now"[19].

We can associate this statement with the fact that poetry, for example, brings in front of our eyes/minds realities and images that are not *effectively* in front of us. The visual arts, do the same using a language without words. In laboratories people re-create conditions to simulate things that are not in front of the scientist. Astronomical observation makes absolutely evident the differences between our *here and now* and the time of the stars (identified by researchers as past, in an essentially anaphoric act that

points towards ancient times, like the syntax of a fairy tale and its formulation: *once upon a time…*).

Then, talking about science and literature means talking about alterity and imagination, about different worlds, or different ways of dealing with worlds. Science, arts, literature, are discourses through which we (the reader, the researcher, the audience) build structures and environments that mobilize our spaces and times. Space and time simulations become our reality, and if we observe this process from a historical perspective, we will find what we call progress, development, evolution or simply instability and doubt.

Ernesto Sabato remarks the inconvenience of dogmatic positions in a real scientist. «If there is something sure about our knowledge is the fact that everything we know right now is partially or totally wrong»[20]. This historical condition of science has to do with the ideas of change, mobility, tolerance and possible worlds. In literature, we also find prejudices when dealing with the "truth" of literary formats and themes, and we find similar changes of "truths". Luis Barrera Linares writes about the notion of *Fantastic* as the inventory of anything that «behaves violently against the rules that organize our world and takes us to a universe that we do not necessarily perceive as impossible, but as less probable inside the world in which we have fixed meanings through language», and states that «the fantastic or the unreal come from a particular reading situation in a specific historical context», it «may rise from the interaction between text and reader, and this interaction might change since the rules of artistic communication between a work and its audience are modified through history»[21]. This also applies to scientific production. Many scientific and technical dreams from the past that right now are part of our daily life, like nanotechnologies, cell phones, videoconferences, space adventures, clones and mother cells, once seemed to be "impossible". Both science and literature transform dreams in possible worlds. To label something as non-literary or non-scientific is part of our current sets of conventions and preconceptions. I remember that in the early nineties I presented a paper about metafiction and self-reference, in which my main objects were rap songs and a parodic Brazilian soap opera named *Vamp!*, written by Antonio Calmon. At that time, a group of more experienced colleagues (some of them were very prestigious literary critics in our academic environment), felt very uncomfortable when she saw that I was applying *serious* literary theory to such non-canonic *corpus*. Now these objects are commonly discussed in our conferences, classrooms and journals. Recently, in a science-fiction meeting in which an astronomer delivered a lecture to our undergraduate students, a student asked about the possibilities of life in other planets and galaxies. The lecturer said that, despite all our

knowledge, we might not recognize life from other environments, since the criteria that define life in other worlds could be unknown to us. The approach to our subjects varies as far as we understand that our conventions are not forever. Every discipline questions itself from within, and every self-reflecting discourse comes from a consciousness of its own language. In literature, this self-consciousness is an awareness of the literariness of textual production and the impossibility of really grabbing the reality around us. In science, the understanding of scientific self-reference as a language of a well-defined and regulated frame shows, as well, the tantalic nature of human knowledge. A poem by Rafael Catalá about quantum physics puts these together when he writes: «quantum fields tell us that touching is not touching anymore»[22]. Our confidence in knowledge, in all metanarratives, has been replaced by uncertainty, by the consciousness of being permanent constructors of models, systems and signs.

In a well known text by Jorge Luis Borges (*On Exactitude in Science*), we read about a map that ends superimposed to the real territory, losing its function as a map[23]. This alerts us against the fact that we seem to feel enthusiastic when we start seeing a possible closer relation between the sign (or the model, the system, the language, the theory) and the "real thing" until we find that we tried to impose a systematic and foreign order to a chaotic and unpredictable world, and that a sign, to work properly, must be a sign.

This is the reason why our continuous *flirting* with self-reference is so complex itself. We see self-inclusive discourses all around us, in computer games, comics, cartoons, tv shows, movies. But even when we rationally understand that, as Mandelbrot said, mountains are not conic, the sun is not round and coastlines never end, we keep alive our older geometrical canons to represent the world and to teach our children how to draw a landscape. It is not easy to understand a wave as a huge conglomerate of smaller waves (like the representation we see at Hokusai's *Great Wave of Kanagawa*), to see the self-inclusive nature of our own blood system and to see that, in fact, we cannot have a definite measure of any coastline since they are not only irregular (considering rock, stones and even sand), but also are permanently changing. Abstraction is not only powerful and useful: additionally, its power of generalization offers us a sensation of certainty: Bloom affirms that «our society likes answers. Uncertainty is difficult for us to accept»[24]. However, when we realize the dimensions of abstractions, we identify that they are not exactly "objective".

The history of literature, science and human knowledge has traced the road towards an unavoidable uncertainty. What we thought to be powerful inside science and literature is being posed into questioning from within their own fields of action and creation.

In literary studies, metafiction and mise en abyme are problematizations of discursive safety. A short story like *Continuity of Parks*, by Julio Cortázar poses into question the certainty of our own real world, and raises the possibility of being living a fiction, or living in a world within another world, like the main character of Borges's short story *The Circular Ruins* … Ernesto Sabato comments, «today Cervantes is as real – or as fictitious as Don Quixote. They both came to us through literary knowledge. In fact, Don Quixote is less fictitious, because we know more about his life, his story, his madness, his feelings and his adventures than about Cervantes»[25]. Then, our metacognition of literature is not so new. According to Waugh, we need meta-systems:

Language is an independent, self-contained system which generates its own "meanings". Its relationship to the phenomenal world is highly complex, problematic and regulated by convention. "Meta" terms, therefore, are required in order to explore the relationship between this arbitrary linguistic system and the world to which it apparently refers[26].

We can compare the view of this metafictional theorist to the one of the physical sciences reflection. Bruce Gregory discerns this point:

How could we compare a theory with the world? A physicist's theory is a collection of mathematical formulas, and the world… well, the world is something completely different. (…) If I say, "The dog is named Willard," I am surely using the word *Willard* to refer to a real animal. There is obviously a difference between the word *Willard* and the dog. When I say, "Electricity is related to electrons in the wire," am I not doing exactly the same thing? Am I not using the word *electrons* to refer to something out there in the world?
In order to talk about the relationship between a theory and the world, we can make use of what a logician calls a *metalanguage*[27].

It seems that we are in front of a problematized Zeitgeist in which we realize that what we represent are ways of representation. The transit from discourse based upon imitation to narrative and diegesis is a transit of consciousness. And it must be said that traditions and older knowledge do not abandon us. Like in our example of mixed technologies in the world, classical physics is still alive; modern physics solves problems in a different way. We have older sonnets and rhymes, and we have contemporary poetry with all its problematic and imaginary compositions. We have traditional novels, and we have hard-to-read experimental narratives. Perspectives and media are all mixed up. As Janet H. Murray writes, «the traditions of storytelling are continuous and feed into one another, both in content and form"[28]. Nevertheless our binary thought is not comfortable with the

idea of living with things that seem to be mutually exclusive. (Wolfgang Iser would say that this is a condition of fiction.) As Sukenick says: «All accounts of our experience, all versions of "reality", are of the nature of fiction»[29].

One of the authors that we have found interesting to show the interaction between the nature of narrative and the worlds of self-referentiality is the Argentinian writer Marco Denevi. In his work it is possible to see self conscious intertextuality and hypertextual links among texts, clearly close to technological hypertexts. Metafiction is a permanent way of narrating even in his works for children, and he uses it to generate uncertainty and to paradoxically build the certainty that our only truths are supported on fictions.

Denevi's novel *Rosaura a las diez* (translated as *Rosa at Ten O'clock*), originally published in 1955 is an interesting metafictional work[30]. The supposed to be main character, Camilo, an art restorer, is presented to us by means of the stories told by other characters. In these stories, we learn that Camilo has an affair with a woman called Rosaura, a woman that the other characters have seen in a portrait painted by him. One evening Rosaura arrives to the house in which all the other characters live, and everything becomes mysterious, until the woman is murdered. But at the end of the novel we find a letter written by the woman… whose name is not Rosaura. Her face was the same everybody saw in the portrait, but the entire story was an invention, a fiction. Almost the whole novel is a group of narratives about a character and a relationship that never existed [inside the novel], a character and a relationship that the other characters came to believe. Fictitious characters "read" and "write" a fiction inside a fiction, and intertextual references and particular simulations of languages create an environment of story that ended being the fantasy elaborated by Camilo. Denevi repeats this pattern in many of his works. The novel is built like a fractal representation, with self-inclusion, like in nature, math o visual arts. Its structure, which has been compared to the film *Rashomon* and to Wilkie Collins's *The Moonstone*, is organized on the declarations of the characters in front of the police after a murder, and this creates from the very beginning a deceiving frame for the reader, because we tend to associate this situation with a context of truth. When we discover that the story of the main character is a fiction and we recognize that the other characters are the readers of this fictional project, we see that fiction is our possibility to build realities, so fiction is not so fictional… Or fiction is our only possibility to construct our reality, since we construct reality as we manage (as coders or decoders) signs about it.

I would like to mention a couple of other Denevi's novels: *Murders of the Holidays* and *Music of Lost Love*[31]. In both texts, besides metafictional

elements, the reference to the idea of the preservation of corpses through a scientific method proposes death as one of the great themes of literature. Utilizing a technique related to taxidermy, an unknown character has preserved the body of the woman he loved, to keep her as if she were alive. And this shows not only a literary theme, but also a scientific one: the need to defeat death. This need seems to be a manifestation of *power*. To defeat death even under the form of simulacrum, text, fictional deceivement, is a fictional mechanism utilized by science and by literature.

The example of death, just like others related to uncertainties and human feelings, is common to poetry, literature and science. We want to explain love and attraction using words and chemistry; we want to defeat death by means of writing and also by science, using medicine or taxidermy… Today, the Internet takes us to the margins/boundaries of time, and death loses contour when we become virtual. Some people passed away but are still there, in their websites or emails. Now the old statement of writing a book, planting a tree and having a son has changed. Maybe today the way of defeating death is to build a website, and here we enter the idea of the virtual, another place in which science and literature meet, even more with the contemporary perspectives of science, technology and information.

We need to review the true idea of the virtual, sometimes seen as a modern or in our daily lives when we think about entertainment, work and computers. In video games, the idea of the virtual invokes the participation of an agent who has an effect on the simulated environment with his/her decisions/actions, even when he/she does not leave the chair in which is sitting in front of his console. From this point of view, the idea of the virtual is not new to literary studies: Iser refers to the "virtual dimension" of the text as the «coming together of text and imagination» in which the reader recreates the fictional world[32]. Foucault *virtualizes* the idea of literature when he puts it in a space of relationship of language and text: in his words, literature itself is a distance inside language, a kind of language that pivots on itself[33]. Then, virtuality and self reference as spaces of textual interaction activated by the reader give birth to each other.

Here we are not talking about virtual reality devices, but about a conception instead. N. Katherine Hayles affirms that «*Virtuality is the cultural perception that material objects are interpenetrated by information patterns*»[34]. Pierre Lévy declares that virtuality «does not refer to some false or imaginary world. On the contrary, virtualization is the very dynamics of a shared world; it is that through we share a reality»[35]. And these two statements work for science and literature. Lévy also observes that language and writing are «two of the major instruments of virtualization» (*ibid.*), and objectivation/subjectivation in the dynamics of virtualization show the

self consciousness of our idea of reality as a convergence field of psycho-social perceptions:

Subjectivation is the implication of technological, semiotic, and social means in the individual psychic and somatic functions. *Objectivation* will be defined as the mutual implication of subjective acts in the process of constructing a shared world. Subjectivation and objectivation are therefore two complementary aspects of virtualization. In fact, in terms of what they do, neither subject nor object are substances but fluctuating nodes of events that mutually interface with and envelop one another[36].

These fluctuating nodes construct a cultural perception in which everyday substance, objects and what we call reality become *interwoven with information patterns*. Maybe the world has been this way all the time, and what we historically call progress and our own discourse about it have brought to the surface more and more complex patterns, patterns that are in fact more difficult to ignore in order to maintain the nowadays impossible isolated perception of reality as materiality. Our ideas about subject and object are not as safe as they used to be. Vattimo remarks that «the intensification of the possibilities of information about reality in its more diverse aspects makes everytime less and less conceivable the monolithic idea of one reality»[37]. Reality, according to this author, raises from the intercrossing of multiple images, interpretations and reconstructions in permanent competition.

Science and literature were metanarratives, and they had answers to some of our most intriguing questions. But now they specialize in posing new problems. They become virtual since, as Lévy declares, have processes that transform «spatiotemporal coordinates […] into a continuously renewed problem rather than a stable solution»[38]. This transforms our older solutions into problems, and, as literature and science in fact do, reformulates the roles of fiction and reality: we start thinking that the material word is not so real, and we realize that our construction of models of reality is our true real world. Trying to grab reality through models, science has to recognize that it is a discourse model itself: that the map will not work if it has the same size of the territory.

In the scientific world, David Bohm refers to the need of a new mode of language: a *rheomode*. According to Ford and Peat, Bohm has also drawn attention to what he feels to be a defect of our common language in that it enfolds what could be called a mechanistic view of the world[39].

The world is flowing in front (and inside) of us, and we have pretended to "catch" this flow through several forms of representation. We even want to have fixed images of this flow in pictures, poems, scientific

theories, names. Our communicative methods are divisions, fragmentations and suspensions of the flow of the world, and the flow of our own perceptions and thoughts, into signs and symbols. In Bohm's view, the ideal language would be a sort of verb continuum: our comprehension of substance is a fiction, since nothing is really static. Virtuality is similar to rheomode if we consider that the common ground of knowledge and perception works only because of dynamics. According to Bohm, nouns should have a kind of "ing" ending in order to represent the continuous changes of their referents, to make our language closer to the "reality" of the world… But… is our mind ready to do that? The (ha)hierarchical system of language is like an operating system to human beings. We probably need that system with "fixed" or simulated fixed elements and moving verbal relations, in order to have the glimpse we need of the world… In the words of Tilley, «[h]owever much we might try to escape from language, we are trapped in its prison house. So, although it might appear a laudable aim to escape a linguistic frame, it is an impossibility. There can be no meaningfully constituted non linguistic semiological system»[40]. What Bohm sees as a mechanistic structure of languages against the fluent and dynamic changes of the world is represented in a poetical way by Wislawa Szymborska in this verses of her poem *The Clouds*:

> I should hurry
> with the descriptions of the clouds,
> since after the thousandth of a second
> they stop being those clouds, and start being others.
> It is natural to the clouds
> not to repeat themselves,
> their shapes, shades, positions, or order.
>
> Without the load of any memories,
> they simply override facts.
>
> They cannot be witnesses of anything.
> In a second, they run away in all directions.[41]

There is a paradox in the fact that language and our vision of the world compartimentalize our perceptions of the Universe. But we do not seem to have options. When someone works in science or in literature, the possibilities of manipulating language increase. When human beings walk inside deeper and more complex worlds of models, they/we can realize that the ideas of here and now are less and less simple as soon as we construct diversifications of our own self and our own knowledge. That is the reason why the idea of de-centered activities became so important since

the Baroque, after the human-centered renaissance thought. We became aware of our own mobility (physical, geographical and intellectual), and this made us conscious of the expanding nature of the world we build. Like in the Internet, we are permanent navigators of knowledge and meanings. Science and literature have (re)discovered that the center is a process, not the person, and a process can be neither stable nor fixed. We are networked, and the simulated conditions of *heres and nows* produced by science and literature for centuries somehow "knew" it, and there we always had a huge world of "as if"s. We were physical, material, "solid". Now we start to perceive ourselves as *virtual* entities, not so solid, because of our self-consciousness, our technologies and our own problematization in space and time.

Lisa Roberts, paraphrasing Miles Orvell, observes that the XIXth century had a "culture of imitation" and the beginning of the XXth pretended a "culture of authenticity", and proposes that our time constructs a *culture of simulation*, the living of experiences and sensations independently from the truth or falsehood of their concrete reality[42]. «The space of the future would be both of real and of virtual nature», comments Paul Virilio in an interview by Andreas Ruby[43].

We are processes, not products. Once upon a time our civilization believed that there was a center in literary texts (like an omniscient author), a possibility of monolithic truths. We believed in ourselves as centers of objectivity, and now we must realize that we are multiple centers of shared subjectivities. The center of a text is the process of navigating through it: reading is not only the linear sequence of words, but a multidimensional *corpus* of allusions and relationships, determined by culture, space, time, affectivity. Such center is fictional and instable by definition, and the production of sense and meaning depends on the mobility of the reader. In the words of Pierre Lévy: «the production of meaning, no longer refers exclusively to the interiority of an intention, to hierarchies of esoteric signification, but to the individual appropriations of a navigator or surfer»[44].

It is fascinating how we have created a world that fits our dreams and creations at different times and geographies, and how this world challenges those dreams and creations in a way that makes us look for new versions or new worlds as well. This consciousness that impulses us to notice from time to time that our approach to knowledge is not enough is the same that makes us understand that we are part of a complex universe in which our old worlds do not disappear: they are part of our heritage. We are that oral-written-print-electronic society. Our poetry has metric patterns and free verses, our novels go from omniscient narrators to polyphonic structures. Sciences have mechanistic and relativistic paradigms. Every way of communicating, creating and observing has its functions, its advantages

and its role. Bruce Gregory observes that «[c]lassical physics demonstrated the power of a language that separates the observer and the observed, the subject and the object»[45]. Today, language tries to put together the observer and the observed, the object and the subject as parts of the same systems. Both science and literature work with constructions of worlds and mediations of languages, and they are both realizing that we have being constructing wonderful worlds. Maybe technology is the place in which they shake hands, or one of the places that can teach us to understand a real dynamics of interaction. The problem of the observer and the observed has to do with networks, connections, virtuality, rheomode and self consciousness about our own modes of representation. Vattimo seems to be right when he says that «self-transparency (to which media and sciences seem to lead us) is devoted to make evident the plurality of mechanisms and internal structures with which we have built our culture»[46]. What we have done is only to put our own confidence in "reality" into question, to know that simulation seems to be our eternal place of knowing. At least we start giving a place to experience, not limiting this to a "feeling" or "sensorial", but also cognitive, linguistic, scientific, intellectual (not separately from the other adjectives). We are starting to accept that we are not "in front of" a world, but inside it. We are part of it and having minds and intelligence and language seems to complicate what could have being a placid life as non-rational animals. Science and literature, at the same time, maintain and question their own systems. We know that we have to integrate ourselves to the flow of the world and the flow of our thought. We do not know if we will be able to do it, since language is our vehicle and also our barrier to do it… In one of his work about traveling, Eric Leed quotes this Buddhist sentence: «You cannot travel on the path before you have become the path itself»[47]. In an example that beautifully puts together science and literature, Julio Cortázar makes a synthesis of this problem. In his book about the astronomic observatory of Jaipur, India, *Prose From the Observatory*, Cortázar narrates the fictional experience of its creator, Jai Singh, in a poetic approach to the possibility of reaching the stars. The book ends with a reflection that states that «conciliation is possible, a world in which obverse and reverse will stop tearing each other, in which man will take his place in that joyful dance that we once called reality»[48]… The approach to dreams, creation, poetry and knowledge requires the self-conscious inclusion of the observer into the observed, without our old quests for safety, knowing that we are part of the world we observe and that the world we observe as humans is perceived through our schemes and systems. Our canonic views about objectivity-subjectivity must be re-signified, our perceptions about the placement of objects and subjects need our consciousness about their virtual condition:

Damned if he cares about the answer, Jai Singh wants to be that what he asks for. Jai Singh knows that this thirst will torture him again. Jai Singh knows that only being the water he will stop being thirsty.[49]

Will we be able to be the road, to be the water, to stop thinking that we have a frame of *solid truths* independent from ourselves and from the world(s) we observe? Science and literature are both working on it, on the virtual patterns that shape us and connect our knowledge and our humanity, our sciences and our humanities: those worlds of representations separated by the schemes we created, even when they are not separable within us.

Notes

1. E. Gombrich, D. Eribon, *Lo que nos dice la imagen. Conversaciones sobre el arte y la ciencia*, Ed. Norma, Bogotá 1993, p. 101. From now on, all the quotes cited in this paper will be in English. However, some of them come from books written in or translated into Spanish. These have been translated only for the purposes of this work. Every title appears in the language in which it has been originally read by the author.

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4. J. Meyrowitz, *No Sense of Place. The Impact of Electronic Media on Social Behavior*, Oxford University Press, New York 1985, p. 339.

5. Berger, Luckmann, *The Social Construction of Reality*, cit., p. 24.

6. B. Gregory, *Inventing Reality: Physics as Language*, Wiley, New York 1990, p. 183.

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9. C. Bousoño, *Teoría de la expresión poética (I/II)*, Gredos, Madrid 1976.

10. R. Cadenas, *Memorial*, Monte Ávila, Caracas 1977.

11. V. Gerbasi, *Retumba como un sótano del cielo*, Monte Ávila, Caracas 1977.

12. Found in *Siete poemas mínimos. Cuatrogatos. Revista de literatura infantil*, in http://cuatrogatos.org/ poesiapoemasminimos.html.

13. T. S. Eliot, *The Dry Salvages*, in E. L. Revol (ed.), *Poetas norteamericanos contemporáneos. (Bilingual)*, Librerías Fausto, Buenos Aires 1976.

14. P. Reverdy, *Escritos para una poética*, Monte Ávila, Caracas 1977.

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18. Locke, *La ciencia como escritura*, cit., p. 121.

19. Berger, Luckmann, *The Social Construction of Reality*, cit., p. 37.

20. E. Sabato, *Uno y el Universo*, Seix Barral, Barcelona 1991, p. 45.

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23. J. L. Borges, *Obras Completas*, Emecé, Buenos Aires 1974.

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36. Ivi, p. 169.

37. G. Vattimo, *La sociedad transparente*, Paidós, Barcelona 1990, p. 81.

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