The Physics of Fiction

> I asked myself; for fiction, imaginative work that is, is not dropped like a pebble upon the ground, as science may be; fiction is like a spider's web, attached ever so lightly perhaps, but still attached to life at all four corners. Often the attachment is scarcely perceptible [...] But when the web is pulled askew, hooked up at the edge, torn in the middle, one remembers that these webs are not spun in mid-air by incorporeal creatures, but are the work of suffering human beings, and are attached to grossly material things, like health and money and the houses we live in.

A room of one's own
Woolf, Virginia

One of the most important conditions that narrative fiction tends to accomplish is to mimesis reality by including references that the reader could easily identify. These references, borrowed from reality, help the reader to recognize and understand the meaning of the story, although the protagonist was the gryphon, created from the lion and the eagle, or the spice worm of Arrakis, which imitates any land worm.

The proposal isn't to make the readers believe that fiction is a fact in their layer of reality, here in the Earth. The intention is to attain that, based on discourse, readers can recreate certain layer of physics, time and space, where relations and elements, even characters, behave according with some rules understandable —as if it were a relative reality that is manifested in a few pages. The readers will identify these elements and relations by comparing them with their own real experience. And based on this identification (this mimesis[1]), they will care about the incidents and they will extract the complete meaning of the story.

When a narration is able to transport us to a layer of fiction, it means that the story is verisimilar, so we are unconsciously assigning a level of probability and so we care about Emerald to be condemn to fire or to discover if the six characters could find an author. The verisimilitude lets us extract the value of other people's experience, without any need to confirm that the story is based on *real* facts.

Largely, verisimilitude depends on the coherence of the different elements of the story and how well they fit to the physics model that has been established in its layer of fiction. The Middle Earth or Planet Arrakis demands that the elements included in their environment fit with their principles of physics. A realistic story will be used as model the physics rules of Earth. If the writer wants to recreate certain historical age, the verisimilitude will demand to be well documented too.

However, even when the story recreates mythic ages or fantastic spaces, the reader demands some realistic signs that they can recognize based on their real experience. Otherwise, if they don't identify themselves with the story, they won't understand the background.

In the quote that open this article, coming from the essay *A room of one's own*, Virginia Woolf defines fiction as a spider web that is laying above reality, but still connected to reality through its corners. Extending further this concept, we can say that every time the readers identify these references that link reality and fiction, they understand the text and they develop their own meaning. They project themselves in the words to understand the meaning of the story based on their own and inner experience.

The referents of discourse include both objects and the relations between them. This last subject, relations, is more complicated to isolate and identify because it is less plastic. Besides, the study of these relations in the physical world has evolved from classic schools —that included at the same time mathematics, philosophy or astronomy— to modern science which is divided in multiple specialties. A division that makes more difficult than ever to identify a common understanding of these relationships.

In classical narrative (coming from poetics), relations and objects are included as part of composition. Composition is not only the agents (i.e. characters), but also actions and reactions that appear within the story. Narration will be different depending on the different decision that the character makes. In the classical narrative, decisions are linked as part of something that we know as plot: a sequence of incidents that are logically organized to conduct the sense from the beginning to the end of the story. A model that is based on a causality chain that is very close to the physics and philosophical models formulated during the eighteen century.

In those physics models, elements are directly related based on a cause-consequence-cause chain that will conduct the story from the beginning to the end. Following this principle, narratology grew up with all kind of theories about discourse composition based on this causality rule.

As Aristotle enunciated in the principles of first analytics, the rules that every human being applies to anticipate the consequences —those that support our conception of reality— are learned from our real experience. For its part, science formulates models to give a common landscape that everyone can apply to understand the physical world. ("The pebble upon the ground", in the words of Virginia Woolf). During the Renascent, the moment when art and science were formally separated, these models focus on causality first with Descartes and some years later to develop physics theories as the Mathematical Principles of Natural Philosophy formulated by Isaac Newton.

This conception of reality, which was formulated by science and philosophy, had an influence in narrative fiction. Writers applied this kind of models to improve the sense of unity, continuity and verisimilitude in the text. The elements of the story are directly linked by causal-effect rules; stories are closed and concluded and the sense of the discourse is (more or less) explicit.

Not before nineteen century this narrative rules were questioned. The rise of evolutionism (On the Origin of Species, 1859 by Charles Darwin) gave a new approach to reality that goes over the causality logic, and the immobility that is involved in these models. The assumption of an organic organization and the rise of ideas as evolution pushed new aesthetic-narrative formulas that appeared as experimental techniques. Formulas that even nowadays are considered as transgressive and minority ones.

The fiction narrative work of Virginia Woolf, James Joyce or Franz Kafka is not based on causality models but on an alternative organization of the discourse. However, in their works, there is still a complete sense —even more real than when text is based in causality— that the reader can observe, although it is not explicitly explained. Nowadays, these formulas are still considered as alternative experiments in storytelling, and causality models are still used for most of the current narrative works. And, of course, are important parts of the day-to-day of any creative writing worker.

Maybe, one of the reasons to keep using causality models in fiction is that the reader had already accepted this way of telling stories. Thrillers or fantasy or science fiction stories, specially the best-seller genres, demonstrate that observing a causality plot in narrative gives enough verisimilitude to avoid other narrative formulas —although they could increase the mimesis value of prose by getting the narration closer to the reader's real experience.

Why should we use experimental formulas in narrative fiction if they will increase probably the composition effort of the writers? Could the reader be able to understand a non-causal narrative fiction, which mostly won't be explained explicitly to them?

Causality models give us many composition advantages: they are easy to understand, to correct, to control, to appreciate. Changing this storytelling formula is not that easy. Moreover, languages and the lineal relations between words seem to increase the value of causality in written: the line of the discourse on paper is closer to a plot than to any other graphic representation. As if we drew a picture based on a unique line, we must create a unique effect just using words that are directly connected based on a sequence of meaning. Something that reinforces the value of plot as a better way to conduct reader from the beginning to the end.

However, the popularity of different ways to understand reality based on social networks, information systems or communication sciences, all of them derived from evolutionism and biological systems theories, have renewed the conception of reality among the readers. Nowadays, any reader knows about relativity or chaos and, at the end, most of them will find in causality models a sensation of artifice, like a technical device that decreases the value of reading because it highlights that what they are reading is not relatively real, not even a dream or a probability. The readers notice the causality composition which reveals that the story have nothing to do with their real experience. Verisimilitude is lower, any reader can imagine what is going to happen and notice the artificial way to compose the story, so the metaphysical value of discourse decreases. Narrative fiction is at a risk for becoming a product to consume and throw away. Maybe it will be still nice to read and as an entertainment, but it will not longer be able to create the possibility of something different that could change, reader by reader, the reality itself.

If causality models that were formulated by science and philosophy were applied as a way to mimesis reality by writers in the past, could we find a physics model to unify this new criteria and help us to increase the verisimilitude in fiction, according with the new conception of reality that the readers have?

1.   *Causality in narrative fiction*

> Causal determinism is, roughly speaking, the idea that every event is necessitated by antecedent events and conditions together with the laws of nature. The idea is ancient, but first became subject to clarification and mathematical analysis in the eighteenth century. Determinism is deeply connected with our understanding of the physical sciences and their explanatory ambitions, on the one hand, and with our views about human free action on the other. In both of these general areas there is no agreement over whether determinism is true (or even whether it can be known true or false), and what the import for human agency would be in either case.

> Stanford Encyclopedia of Philosophy

Although causality was already anticipated by Aristotle, it was formally formulated on eighteen century and its influence in narrative fiction was consolidated during nineteen century. All the
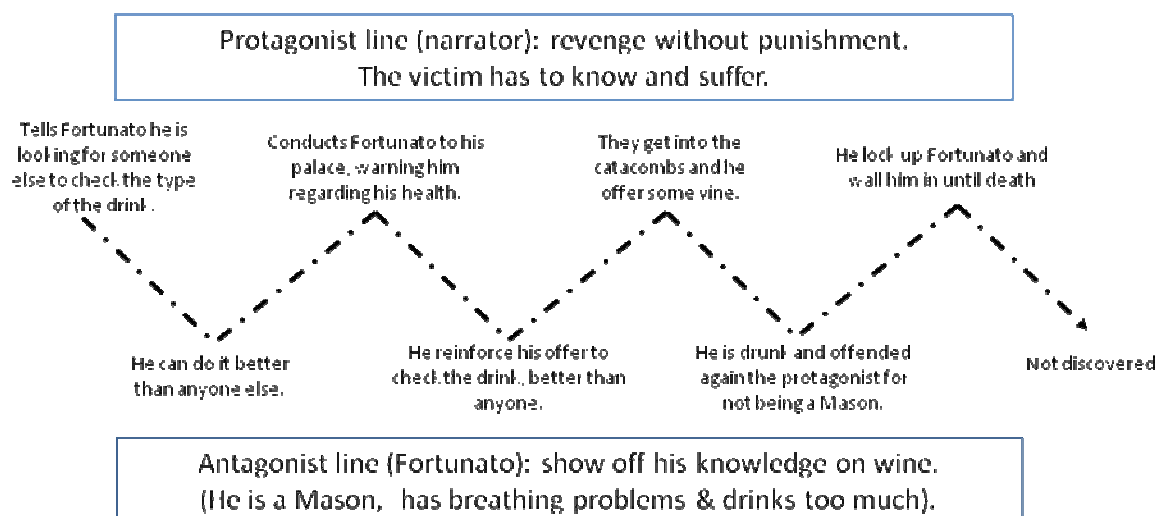
incidents in the story must be directly related and all together conform a fixed chain: each incident will open a decision that, for its part, will bring some consequences that will open a new decision. Following this chain, the reader will reach the end, where the change of state happens.

In this model, verisimilitude is sustained by plot: as far as the composition fits the causality chain, the story will be more coherent and the meaning will be better understood.

Based on this definition of verisimilitude, narrative fiction writers developed closed stories: elements and plot were chained and concluded. Just as the science understands that physical reality works: every phenomena could be measured and even its effects could be forecasted. This narrative formula will find the highest perfection with Edgar Allan Poe. Just as he showed in his short story *The Cask of Amontillado.*

In this tale, Poe draws a line that conducts from the will of the narrator to perform a revenge (cause) to its results (change of state). Fortunato, the victim, went over the narrator injuring him and the narrator-protagonist decides to cheat him by using the weakness of his victim: his pride. He requests him to confirm the authenticity of certain cask of vine that he pretends to keep in his family catacombs. A place of unhealthy air that won't be a good site for the victim that has a breath condition. But although the avenger explains the drawbacks of being involved in such undertaking, the pride and arrogance of the victim will keep him involved anyway.

Poe recurs to a dialectical debate to impulse the incidents from the avenger against his victim, drawing a causal and effect line of action that is very close to a tennis match. Something like this:

Protagonist line (narrator): revenge without punishment.
The victim has to know and suffer.

Tells Fortunato he is looking for someone else to check the type of the drink.

Conducts Fortunato to his palace, warning him regarding his health.

They get into the catacombs and he offer some vine.

He lock up Fortunato and wall him in until death

He can do it better than anyone else.

He reinforce his offer to check the drink, better than anyone.

He is drunk and offended again the protagonist for not being a Mason.

Not discovered

Antagonist line (Fortunato): show off his knowledge on wine.
(He is a Mason, has breathing problems & drinks too much).

Wonderful story, clever, ironic, closed and concluded by any reader: a revenge without punishment.

This masterpiece gives us a stimulating and edifying reading. However, at the same time, its strict observation of causality produces a sense of artifice that damages both verisimilitude and reading value. Any contemporary reader, trained in incoherence and chaos that science have formulated over a century ago, will notice this strict organization and will recognize a safe and unreal entertainment. In a more or less conscious way, our experience puts everyone of us over causal reality.

Scientific models try to get us closer to randomness by considering random variables or indeterminate equations. As a result of this general conception, readers are getting more and more skeptical to a narrative composition that tries to emulate their experience based on a deterministic composition. A type of composition that have already been overtaken by the arise of numerous scientific theories and also by the reformulation of humanistic disciplines, as information and sociology sciences, based on few rules summarized as *The Systems Theory*.

2. Systems in narrative fiction

> Anybody considering the history of science of the nineteen century [...] must admit that the development of the evolutionist ideas was the most important movement during the period. The technical and intellectual developments in Physics had remarkable effects; but it was Biology with its evolutionist development the one that ruled and founded the thinking of the nineteen century.

> *History and Philosophy of Science*
> Hull, L.W.H.

Nowadays, science has moved forward to exceed the causality model: the biological system, which breaks into the conception of the physic world, highlighted that the world is not as predictable and immutable as we believed but changes and adapts constantly, and laid the foundation of our current understanding of reality. The living organism that adapts to their environment is included as a part of the physics model and this new idea drives the emergence of new theories and scientific models during the 20th century.

In the 60's, the heterogeneity of scientific disciplines are synthesized in *The Systems Theory* by Ludwig Von Bertalanffy, that summarizes common scientific rules into a few principles that can be applied to create new models by any discipline, including humanities.

In narrative fiction, evolutionism makes writers of the late nineteen and early twenty centuries dispute causality principles as essential rules to narrative composition. Writers experiment with different ways to imitate the real world as stream-of-consciousness, exception science (pataphysics) or counterpoint that review classic theories about narrative composition. James Joyce, Virginia Woolf, Alfred Jarry, Franz Kafka or Aldous Huxley explored ways to tell stories based on the idea of biological systems.

But, what is a system?

> System is an assemblage or combination of things or parts forming a complex or unitary whole. An *open* system (biological) is a region separated from its surroundings by a boundary that admits a transfer of matter or energy across it.

> Random House Unabridged Dictionary

In other words, a set of elements that all together create something different than the sum of its parts. Human beings, over the joining of their cells and organs; the train, that never could exist without boiler, wheels or pistons; the ocean that is integrated by water wildlife and tectonic plates are systems composed by single units, independent and bounded, that exceed the sum of its parts.

Besides, the system is characterized by its tendency to disorder, that only levels by a permanent re-adaptation and feedback with its environment. A condition that explains why a closed system as the washing machine, that is not able to regulate itself by this feedback, tends to be broken.

Finally, in a system the elements that integrate it are as important as the relation between them. Relations that are frequently so complex and so indirect that to draw their effects (their consequences) is almost impossible. It is almost Kafkaesque.

In brief, these are the main features of a system:

- Synergy: it is more than the addition of its elements. (2+2=5)
- Entropy: it tends to disorder (chaos).
- Feed-back (opened system, biological): biological or opened systems would manage this disorder by interchanging information with their external environment.

  And one more consideration: there is not direct relation between all these elements, although each one influences indirectly in each other because if not they eventually disappear.

These principles are applied to narrative fiction by creating stories where every element gives a value to the composition, although they are not necessarily directly linked by a plot of causal-effect relations. Sometimes, the protagonist is not able to understand the situation where he is involved, as in many stories from Kafka. Sometimes, not even the reader is able to extract the meaning from the text, and had to fill the lakes of information based on the hints given by the writer. And even considering the possibility of finding an exception to the rule.

3.   The exception to the rule

In his essay *Some facts about short stories*, Julio Cortázar wrote the following statement:

> Almost all the stories I have written are classified as fantasy because there is no other genre to fit them in, and they take exception to the false realism that consists in believing that everything can be described and explained based on optimistic philosophy and science of eighteen century, in other words, inside a world ruled by a few systems, by cause and effect relations, by well defined physiologies and well mapped geographies. In my case, the suspicion of a different and secret order less communicable, and the fertile findings of Alfred Jarry, who thought that the real study of reality wasn't in laws but in their exceptions, have became some of the principles I have used to orient my personal search for literature in the margin of a too naive realism.

Some facts about short stories
Cortázar, Julio

Julio Cortázar suspected explicitly a different organization of reality based on exceptions and on some kind of changing rules, that doesn't fit with the causal models that were applied in writing. Actually, he knew Edgar Allan Poe's work in depth: he had already translated most of his work and he drew causality models as a master.

His short stories were part of his most important contribution to the art of writing: he could solve the meaning by creating few causality connections but by including semantic fields to conform a

complete sense of unity in the reader. And occasionally, the meaning was out of the text, as it is done in his short tale *House taken over*.

The story '*House taken over*' is about a single couple of brother (narrator) and sister (Irene) that live together in an old house where they have no occupation but his reading, her knitting and the housekeeping. The sudden invasion of the house pushes them to move from one room to another, until they eventually abandon the house leaving back all their personal belongings. They are so desperate due to this invasion that, although they have already left the house, they throw the key down the sewer in order to preserve any thief to get into and to find the house taken over.

To develop this story, Cortázar has distinguished four independent parts organized as follows:

1. Family background: the main incident is the threat of cousins that will inherit the house. (Obscure cousins).
2. Life style of the couple: the main incident is the secret clothes that Irene hides in the drawers. (Brother, Irene, Knit & Secret shawls).
3. Detailed description of the house: they can live in one ball, behind the oak door. (The house).
4. The invasion itself, which follows a sequence of incidents direct linked that conducts the couple from room to room until they abandon the house. (Noises).

Cortazar's story can be drawn as something like this:
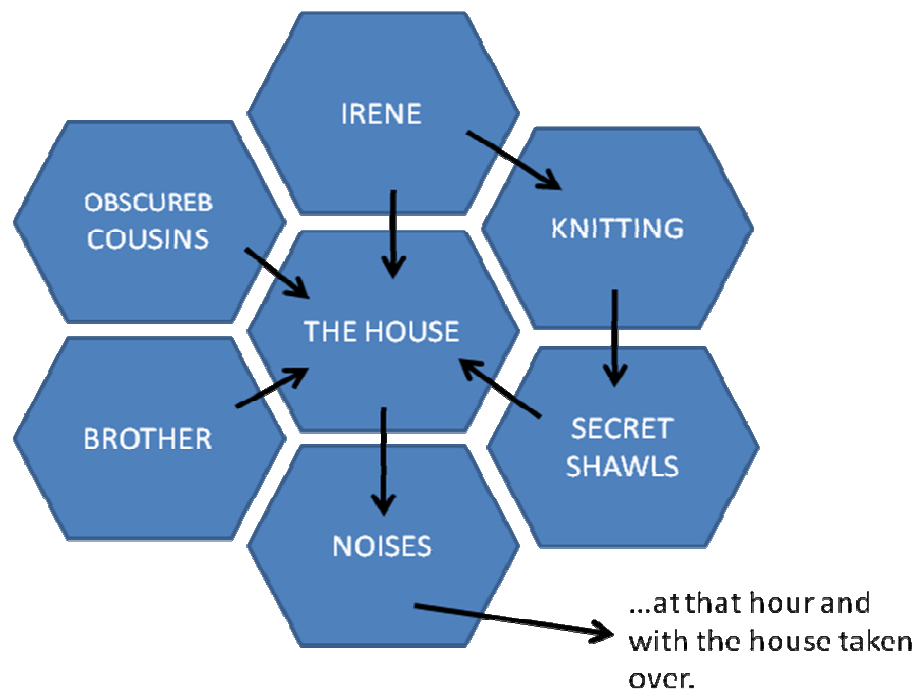
There are different elements (knitting, cousins, shawls, housekeeping) that are not directly related to the invasion. These elements are relevant because they evoke their meaning in the readers and conduct unwittingly them to conclusions.

For instance, the appearance of obscure cousins evokes the threat of someone that could invade the house. At the same time, the shawls that Irene hides in a drawer, connote that there are some things that brother and sister just don't mention.

The last part of the story is organized through a sequence of incidents (a plot) that conducts the couple from room to room without any explicit explanation. They simply run away and isolate themselves from the part of the house that already had been taken over.

Semantic fields and the environment (the house), the characters and the narrator voice create the sense of unit although the plot is not drawn until the last part of the story.

The reader is conducted by the power of objects and words to their own conclusion (most of the times that the house is taken over by thieves), but the writer anticipates this conclusion and reverses it, creating a sensation of incompleteness closer to real experience than if every element fitted in a causality composition.

In this story we have synergy because we have a meaning that is over the addition of its parts or elements, we have entropy in the way story is structured (without any direct relation between all the elements) and we have feed-back because the meaning is only coming from us to the story, instead of giving us any conclusion. This way of telling, in a non-causal way, generates a widest fiction experience to the reader, which is going to believe in the fiction layer of the story stronger than if it was artificially closed.

Nowadays, the legacy of Cortazar (and the first generation of writers that at the beginning of the twentieth century questioned the value of causality in narrative fiction) can be found in storytelling works of David Foster Wallace in narrative or Paul Thomas Anderson and Charlie Kauffman in filming. All of them experiment with alternative ways to create a sense of unit and are considered as exceptions by the storytelling critique and as original artist by the people. Indeed, all of them are an exception of the causality rules that still commands on storytelling, especially in narrative fiction.

4. Narrative challenges

The central problem of novel-writing is causality.

Narrative Art and Magic
Borges, Jorge Luis

Why is the causality model still in force? One of the reasons could become from the language: discourse composition in narrative fiction is supported by the language that has to follow a sequence of meanings and relations to create a different meaning. This lineal sequence is closer to a cause-effect model than to a system composed by parts that are not directly connected by any plot.

The composition of the story from chronological timeline to causality plot demands a huge effort to develop, organize and conduct the characters in the novel; to drawn and develop the action in short narrative. And the only tool we have, the language, is based in this sequence of words logically organized.

However, storytelling has already discovered new ways to explain reality as advertising or filming or Internet, media that take advantage of relations between people and content, that creates stories using the meaning of the object that evokes more than its connotative sense (as Barthes already explained) or design characters that exists not only for their value within the plot, but for their own potential of action in the story, as in the new computing network games.

The solutions found by other writers are presented as an aesthetic experimentation instead of being a new way to tell. Even now, the bottom lines from Foster Wallace or the semantic fields from Woolf or Cortázar are still considered as exceptions or as a personal way to understand storytelling instead of being a new knowledge of mimesis for the new conception of reality. A mimesis that, perhaps, the reader is waiting for, after over a hundred years of learning on systems, chaos and adaptation as a way of life.

We still have a lineal but powerful tool, language, that is likely to draw causality plots to conform the sense. What if it is just a question of conducting the reader from one corner to the other, from one meaning to the next, from one link (up-down-left-right) to the following like the spider does when she is writing her own layer upon our reality?

Bibliography

- Woolf, Virginia; *A room of one's own.*
- Ricoeur, Paul; *Time and narrative.*
- Stanford Encyclopedia of Philosophy; *http://plato.stanford.edu/*
- Random House Unabridged Dictionary
- von Bertalenffy, Ludwing; *General systems theory.*
- Cortázar, Julio; *Some facts about the stories.*
- Benedetti, Mario; *Julio Cortázar, a narrator for complicit readers.*
- Aristotele; *Poetics.*
- Barthes, Roland; *Introduction to structural analysis of short stories. Critical Essays.*
- Poe, Edgar Allan; *Extraordinary stories.*
- Cortázar, Julio; *Bestiario.*
- Hull, L. W. H.; *History and Philosophy of Science.*
- Borges, J.L.*: Narrative Art and Magic*

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[1] Third level of mimesis as it is in Paul Ricoeur's *Time and Narrative*.