

**MINISTERUL EDUCAȚIEI NAȚIONALE
UNIVERSITATEA „1 DECEMBRIE 1918” DIN ALBA IULIA
FACULTATEA DE ISTORIE ȘI FILOLOGIE
ȘCOALA DOCTORALĂ DE FILOLOGIE**

SUMMARY OF DOCTORAL THESIS

**TRAUMA, WAR AND NEW PHYSICS EPISTEMOLOGY. AN
INTERDISCIPLINARY APPROACH (Jorge Luis Borges, Kurt
Vonnegut, Martin Amis, Peter Ackroyd, D.R. Popescu, Mihail
Grămescu)**

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**ALBA IULIA
2019**

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Key words: trauma, war, New Physics, interdisciplinarity, quantum, multiverse, many-worlds, parallel universes, entropy, quantum superposition, escapism, New Historicism.

The title of the present thesis is *Trauma, War and New Physics Epistemology. An Interdisciplinary Approach (Jorge Luis Borges, Kurt Vonnegut, Martin Amis, Peter Ackroyd, D.R. Popescu, Mihail Grămescu)*. The main aim of our project is that of demonstrating that all the aforementioned authors resorted to scientific tropes and the scientific discoveries of the day in order to be able to cope with some forms of trauma (this is not limited to war trauma, but extends to the personal one as well), and that the many-worlds interpretation of quantum mechanics either opened a door leading to better worlds in which these traumatic events never happened, or, on the contrary, they opened a door into a world in which the unthinkable happened, and if the writers imagined such apocalyptic scenarios, they did so in an effort to keep this world sane and warn us in regards to the ‘what if’...

By setting out to reconstruct the past through explorations of the exchange of semantic energy among the discourses of an age, New Historicists from Foucault to Greenblatt and the cultural poetics born thereof may be seen as twin effects of the 80’s, when Michael Lampton Commons and Francis Asbury Richards from Harvard Medical School Department of Education summed up ongoing discussions on interdisciplinary studies under the umbrella concept of postformal, integrative thinking (Commons & Richards 1984). While enlisting the concepts and vocabularies of cultural poetics and interdisciplinary as the foundational framework of our approach to a number of writers out of the numerous ones who turned to New Physics for models of their fictional universes, we were however progressively led to the conclusion that the world conflagrations of the last century weighed heavily in the scales of their choice of escapist solutions, which was the reason why our theoretical framework expanded to include suggestions from ethical criticism and Trauma Studies. A merely epistemological perspective would have narrowed down the scope of these remarkable literary works, it would have deprived them of the deep recesses of their soul.

Our thesis is divided into three major chapters preceded by an argument, a short outline of the thesis and the introduction in which we look into the concept of New Physics more carefully. We state the main aim of the thesis in the argument section.

In the **introduction** we present several physicists alongside with their major discoveries. Their historical and political background is also analysed since taken out of context, the discoveries lack meaning and their impact cannot be accurately assessed. Additionally, we touch on major concepts that underpin our analysis – entropy, quantum superposition, Schrödinger’s

cat, Heisenberg's uncertainty principle, the many worlds interpretation of quantum mechanics. It is also in the introduction that we explain the importance of the interdisciplinary approach alongside with the New Historicist one.

That interdisciplinarity goes a long way back is proven by John Burroughs's (1837-1921) essay *Science and Literature* in which he distinguishes between the scientific and artistic mind, but gives credit to those artists or scientists who can combine the two of them:

The literary treatment of scientific matter is naturally of much more interest to the general reader than to the man of science. By literary treatment I do not mean taking liberties with facts, but treating them so as to give the reader a lively and imaginative realization of them – a sense of their esthetic and intellectual values. The creative mind can quicken a dead fact and make it mean something in the emotional sphere. When we humanize things, we are beyond the sphere of science and in the sphere of literature. We may still be dealing with truths, but not with facts.” (Burroughs 1914: 417-18).

Literature and science are no longer two distinct, conceited entities, but a unity in which there is unrestrained flow of information in either direction.

The **first chapter** of the thesis looks at the works of three authors who, at first sight, have very little in common, if nothing at all: an Argentinian writer, an American and a Romanian one: Jorge Luis Borges, Kurt Vonnegut and D. R. Popescu. However, when looked at in the manner of an impressionist painting, the three authors make up a highly meaningful work of art that militates against war, violence, injustice and non-value. All writers are fierce fighters against the cult of the hero which proves to be as nonsensical as wars themselves. But most importantly, they intuitively integrate quantum concepts in their works, either anticipating future theories (Borges and Everett's many-worlds interpretation) or using the day's quantum interpretations in their works (D. R. Popescu and Schrödinger's cat).

In *The Garden of Forking Paths*, Borges resorts to parallel universes because they offer a way out from a universe taken over by wars: “In all fictional works, each time a man is confronted with several alternatives, he chooses one and eliminates the others; in the fiction of the almost inextricable Ts'ui Pên, all possible outcomes occur...” (*Labyrinths*: 51). And one such outcome would be the absence of wars, a universe in which Albert and Yu Tsun are friends, a universe in which Yu Tsun would not be a spy.

Although only hinted at in *The Garden of Forking Paths*, Borges's philosophy according to which a hero is not necessarily the one capable of the supreme sacrifice, but the one who embraces his own weaknesses, is more visible in the story *The Other Death*. There is nothing romantic in feeding someone with false ideals. "Futilely I told myself, over and over, that a man pursued by an act of cowardice is more complex and more interesting than a man who is merely brave." (*The Aleph and Other Stories*: 56). Borges confessed his dislike for war and violence whenever he had a chance: "Nu cred în violență. Nu cred în război. Cred că totul este o greșeală. Cred în înțelegere. Nu cred în țări." (Barnstone 1999: 89).¹

Irrespective of time and country, wars are and will always be nonsensical. Ironically, in *The Other Death*, a new universe is created through the alteration of perceptions not to escape from war, but to embrace it. Erasing it would have had no impact; by recreating it we are reminded of its dehumanising power.

Our assumption that Borges's creation of parallel universes is not gratuitous is furthermore strengthened by the short story *Tlön, Uqbar, Orbis Tertius* in which a new world is manufactured in response to a world enchanted by Nazism and anti-Semitism. However, unlike *The Garden of Forking Paths* in which the existence of parallel universes offers a safer alternative to reality, *Tlön's* existence doesn't seem to offer a haven. It may be fascinating at first, but it turns out to be a somewhat nightmarish version of reality.

Tlön is the creation of a secret group of intellectuals; it is an alternative reality that exists simultaneously to ours. It lacks any spacial borders since it exists as a mental process. It claims superiority and authority; it is almost a parallel to the Aryan universe envisaged by the Nazis.

The next author analysed in the first chapter is **Kurt Vonnegut**, sometimes labelled as a science-fiction author. We argue against this label proposing that that usage of the tropes and topics normally associated with science-fiction literature serves a specific purpose: recovery from trauma and coping with an altered new reality (altered because the subject himself will never be the same as before the war experience).

In *A Man Without a Country*, it is Vonnegut himself that undertakes the task of withdrawing his name from the science-fiction drawer, one not particularly respectable at that time.

I became a so-called science-fiction writer when someone declared that I was a science-fiction writer. I did not want to be classified as one, so I wondered in what way I'd offended that I would not get credit for being a serious writer. I decided that

1 (Trans.) I do not believe in violence. I do not believe in war. I think all is a mistake. I believe in understanding. I do not believe in countries.

it was because I wrote about technology and most fine American writers know nothing about technology. (...) I think that novels that leave out technology misrepresent life as badly as Victorians misrepresented life by leaving out sex. (A Man Without a Country: 19-20).

Slaughterhouse-Five was published in 1969, that is 24 years after the end of the Second World War. Vonnegut needed this hiatus to muster enough courage to write about what we have said to represent the crux of his literary career. He confesses: “In 1968, the year I wrote *Slaughterhouse-Five*, I finally became grown up enough to write about the bombing of Dresden. (...) Of course, another reason not to talk about war is that it’s unspeakable.” (Vonnegut web: 20, 21). As we have seen in the previous chapter on Borges, war has nothing romantic or spectacular about it. We analysed the short story *The Other Death* and highlighted two lines that may well serve Vonnegut’s anti-war philosophy: “Poor little mestizo bastard, he’d spent his whole life dipping sheep, and all of a sudden he’d gotten himself swept up in that call to defend the nation.” (*The Aleph and Other Stories*: 56).

However, Vonnegut’s trauma is not just one related to having attended the war, his very own life was rather traumatic given the German roots of the family, his mother’s suicide on Mother’s Day, his sister’s and brother’s-in-law deaths and then the adoption of the nephews and nieces. Moreover, Vonnegut’s war trauma is atypical too and, consequently, somewhat more complicated. On the one hand, it belongs to the World War II experience and is supposed to treat the unspeakable with unspoken words (paradoxically Vonnegut does respect the norm - not because he wanted to, but simply because he was unable to describe the experience). On the other hand, even if not a perpetrator himself, Vonnegut is affected by the perpetrator’s trauma on account of identification and belonging to the group of perpetrators (the Americans bombarded Dresden and killed thousands of civilians). Moreover, the perpetrators themselves are not aware of their own status and their deeds are perfectly justifiable since there are fighting the Nazi ideology synonymous with the German nationality.

In *Slaughterhouse-Five*, Vonnegut resorts to time travel because he wants to stay sane. Martin Amis, whose novel, *Time’s Arrow*, will be analysed in the last chapter of this paper, uses the same technique – time travel. The only difference is that Amis imagines time travelling backwards so as to annihilate the reality of the Holocaust, whereas Vonnegut resorts to these time lapses or anomalies (jumping forwards or backwards without a warning) as a coping mechanism. Vonnegut experienced the war, Amis did not. But both writers have chosen time travel instead of parallel universes because they cannot ignore the universe in which the Second World War

happened. Vonnegut chose to deal with the Second World War humorously (Billy looks like a flamingo and when two soldiers are shot dead, the snow becomes red like raspberry sherbet), Amis chose to use shocking images – even when using humour (*The Zone of Interest*) his prose is still sharp.

We also dedicate a subchapter to Vonnegut's relation to science in an attempt of understanding better his life philosophy, but also two of his other novels: *Cat's Cradle* and *Player Piano*.

Vonnegut was not exactly a science addict, since, to him, science was responsible for the greatest acts of destruction. After the Depression, people really thought that salvation would come from scientists and mathematicians. In 1945, in the aftermath of war, scientists were seen as heroes, especially those who had built the atomic bomb. In Adam Curtis's documentary – *Pandora's Box*, episode six – *A is for Atom*, we learn that according to *Life* magazine, scientists are men who wear the tunic of supermen and stand in the spotlight of a thousand suns. The power of science was limitless and the enthusiasm was contagious. With nuclear power, the science fiction worlds became reality. And in the real world, nuclear power became profitable and started a business. Knowing this background, it is easy to understand where Vonnegut's *Player Piano* and *Cat's Cradle* come from. Once the atomic enthusiasm tapers off, the awareness of the unleashed power and the realisation of what could happen gradually dawn on – hence Vonnegut's and Amis's fears.

Vonnegut has all the reasons not to trust science – not just because he was familiar with General Electric's whereabouts, but because science and the nuclear advancement inaugurated a new order of destruction. He confesses in a BBC documentary: "I was born in 1922 and then I had a father and a brother who believed strongly in technology. (...) I was a great believer in truth – scientific truth – and then, as I once wrote, the truth was dropped on Hiroshima so I was hideously disillusioned." ("Kurt Vonnegut – So It Goes" 2014: *Youtube*).

The theme of the multiverse is next analysed in the novel *Mother Night*; we also try to demonstrate to what extent the spy story is similar to that of Borges's in *The Garden of Forking Paths* since the very nature of a spy implies a double existence and double universes. Howard Campbell (the main character in *Mother Night*) exists in quantum superposition, he is both a spy and a traitor, a Nazi, an anti-Nazi, a Fascist. He can be all of these and he is all of these.

Vonnegut's humour is part of our analysis as well with the specification that it is a fabricated, self-imposed one as response to trauma. Faced with extreme, limitless situations, laughter offers a haven. Although not pertaining to *Slaughterhouse-Five*, we will include Vonnegut's doodles as well in our analysis, the rationale being that Vonnegut cannot be analysed

and understood based on one novel only – the doodles are to be found in his other novels. To a certain extent, we believe that these doodles are not particularly beneficial, since they suggest Vonnegut is an easy reading that should not be taken too seriously. In reality, they are of utmost importance since they reinforce his ideas. Moreover, when deciding to incorporate the doodles, Vonnegut might have been under the influence of one of his best friends, Saul Steinberg – the cartoonist and illustrator of Jewish origins, born in Romania.

The next subchapter of our thesis analyses D. R. Popescu's novel which focuses on the same topic of nonsensical wars and heroes that are just ordinary men, the hero terminology being imposed on them.

Întoarcerea tatălui risipitor (The Return of the Prodigal Father) was published in 2008 and requires an in-depth reading. The detailed descriptions, the twisted plot, the characters built after Swift's model, the actors meant to play the characters, all these make the reader understand that the writing of such a novel required time and perseverance. Although entertaining, there is serious tragedy interwoven between the lines. The tragedy of the promoted non-value, the gossipers who want their imagined world to be the real one, deracinated people, dysfunctional families and the individual left to his own suffering without any real concern or help from the others.

Now to what extent does D. R. Popescu's novel follow in line with the main topic of our paper? And what is the goal we aspire to by including *The Return of the Prodigal Father*? After all, there is no specific quantum reference, nor is the author canonized (accurately or inaccurately) as a science-fiction writer. Well, it does have plenty to do with our research since there is a clear anti-war message which permeates the very first pages. Moreover, although very discrete, there is a rather poignant quantum reference by using a character (Paraschiv) who is both alive and dead at the same time, thus corresponding to the principle of quantum superposition. Sentences are built in the affirmative, but their predication is immediately denied, as if the narrator were telling two contradictory versions of the same story; as if the characters were living in parallel universes, emerging out of forking. This double layering of the narrative serves a moral purpose – that of showing that the world itself is layered, that some layers are visible, others are not, and that questioning everything around us is crucial given that there is no way we can be a hundred percent sure of anything. The same applies to the order of supreme values, as the dividing line between a hero and a mercenary becomes blurred. Underneath the world promoted as the model to be followed, there is a hidden one, in which flaws swarm and multiply like cockroaches.

Vonnegut's *Slaughterhouse-Five* toys with the idea that writing an anti-war book (and by extension we could say any anti-war message) is as futile as any anti-glacier book. Wars happened and they will continue to happen; this is the realisation that Popescu has come to: "...în timp ce ploaia, timidă, nevenindu-i să creadă ce vede, se apleca și ea peste războiul de o noapte, de o mie și una de nopți, de treizeci de ani, de o sută de ani, de două mii de ani, de ani fără număr...". (Popescu 2008: 12).² It is also hard to ignore the whole hero – anti-hero saga around which the novel revolves. Popescu is highly skilled in using details and stretching the topic till its breaking point, but he does not forget the essential, that is the questioning of the very concept of a hero based on the fact that, usually, all the commemorated heroes are dead which makes their status pointless. Popescu's novel brims with quantum references – the quantum superposition, parallel universes or Heisenberg's uncertainty principle adapted to life in a village: "Doamne, e groaznic să te trezești din somn și să bagi de seamă că tot ce ai visat se întâmplă sub ochii tăi!... Să n-ai cum opri visul, să nu poți face nimic-nimic?! Ca și cum ai ieși din mersul zilei și-ai intra într-o altă zi, care e a cui?..." (Popescu 2008: 39).³

The existence of a parallel universe allows Paraschiv to be alive and well, far from the irrationality of the war. Ms Filofteia Năsturel may never have heard of Schrödinger's cat and quantum physics, but somehow, she visualizes what others can barely imagine – the quantum superposition – meaning that quantum particles not only can, but really do exist in overlapping states at the very same time. She tells the regional governor: "Vedeți, el este și în coșciug... și pășește și printre noi! (...) Aici e vorba de o realitate – cuprinsă în copârșeu! - și de o altă realitate... fantastică..." (Popescu 2008: 191-192).⁴

In addition to the parallel universes proposed, D. R. Popescu manages to create some extra confusion by shaping a palpable parallel universe, a new world, through the actors meant to recreate the whole funeral with the purpose of documenting everything: "- Dumneata ești chiar doctorul Sebastian, de la morgă, sau ești de-al nostru, actorache?... - Are vreo importanță?"⁵ If Popescu resorts to parallel universes, he does so because it offers him the hope of a universe, a world and a Cioromârda in which the non-value is a non-value, whether mathematical or human, and is treated accordingly. For the time being, the reality and universe he inhabits is one that

2 (Trans.) "... while the rain, timidly, hardly believing what she saw, was coming down on the one night war, the one thousand and one war, the thirty years one, the one hundred one, the two thousand one, the one of countless years..."

3 (Trans.) My God, it is awful to wake up from a dream and realise that everything you dreamt is happening right under your nose!... And without being able to stop the dream, or do anything at all?! As if you stepped out of the day's course and entered the course of a different day, but whose day?...

4 (Trans.) You see, he is both in the coffin, and ... walking among us! (...) This is about one reality trapped in the coffin! - and another reality... a fantastic one...

5 (Trans.) Are you doctor Sebastian himself from the mortuary, or are you one of ours, an actor?... - Does it really matter?

does not care too much about moral values and principles. In mathematics, place value refers to the value represented by a digit in a number based on its position in that number (in 2019, for instance, 2 is in the thousands' place and its value is 2,000, whereas 0 is in the hundreds' place and its value is 0). Cioromârda's problem is that mathematics functions differently here – the value 0 is non-existent. Moral judgement is suspended.

The **second chapter** is dedicated to an analysis of Ackroyd's *The Plato Papers* and Grămescu's collection of speculative short stories - *Aporisticon*.

In Ackroyd's novel, there is constant reference to Plato, the one who speculated on the theory of forms and exemplified his theory in the well-known visual allegory of the cave. This could actually be considered the first attempt at formulating a new theory that would only come into being centuries later – the multiverse, the existence of different simultaneous realities. Moreover, the allegory also anticipates Heisenberg's uncertainty principle which asserts that all the physical quantities we are able to observe are subject to unpredictable changes which means that their values cannot be established with precision. This is not because our measuring instruments are fallible, or because we have not evolved enough to measure them accurately, but because this condition of uncertainty is inherent in nature. Ackroyd's Plato also doubts the reality that surrounds him and is aware that his perception is a limited one. Additionally, we are informed of a journey, a descent he makes into the world of Mouldwarp, the inferior world of the ancestors, which somehow coexists with that of his: "I will debate with you on the merits of two realities existing simultaneously, and together we may decide that all versions and visions of the world may coexist eternally." (Ackroyd 2000: 100-101). The references to the multiverse theory are so blatant that we cannot possibly turn a blind eye to them.

Our analysis of the cave is also in line with the New Physics interpretations. The cave might correspond to a smaller black hole containing a singularity. The latest research tends to contradict the initial assumption according to which irreversibility is the main property of black holes. Plato returns from his journey, so this means that his cave is a black hole that opens a portal to a new universe. This is possible because of the theory of Loop Quantum Gravity, or LQG for short. This one was developed rather recently, in 2006, and it tries to address the caveats of the Big Bang event and of the theory of general relativity which cannot explain what happened before the singularity, before Big Bang. Another caveat would be the so called information loss paradox which stands for the lack of an answer to the question of what happens to the information that falls into a black hole and is eventually squeezed into a singularity. According to LQG, the universe didn't create itself out of nothing and as a result of the Big Bang; before Big Bang there must have been another universe shrunk to a tiny spot that would

explode into Big Bang and then would shrink down again, generating a repetitive process or a loop.

In the first chapter, the new universes created were meant to alleviate war traumas. Here, in Ackroyd's and Grănescu's writings, there are wars of ideas and traumas just as powerful. Plato is an independent being – he cannot function as part of a system that absorbs all individualities in the name of uniformity: “Conscience is knowledge with others. Here we are all one city. We are the limbs of the city. We are a common body. How can you wish to part yourself from us?” (Ackroyd 2000: 117). What Plato the Londoner opposes here is exactly what Plato the Greek imagined as perfection in a just city. In the *Republic*, Plato sets the guidelines for an ideal city – Kallipolis - ruled and guarded by philosophers (because they are those who have knowledge of the Forms). There is no doubt that London of the 3700 is built after the model of the *Republic's* ideal city. We know that the guardians are those who are responsible for keeping London's citizens within the boundaries of their assigned roles and that it is they who will also condemn Plato for the crime of voicing out that there are no certainties. This is Plato's trauma – his desire to escape a city which smothers any sign of individuality and originality. Being acquitted in the end for having fallen victim to some sort of fever or hallucination brings no comfort to Plato who opts for exile. There is nothing more demeaning than being treated as a mentally troubled individual. If Plato is to be tolerated in the city he must obey the guardians – his thoughts can only be those that tick the criteria established by the rulers. In other words, he will have to bow his head in front of censorship – the unmistakable syndrome of totalitarianism.

The theme of the city built and guarded by individuals seeing themselves as belonging to a superior caste is to be found in the work of the Romanian writer - Mihail Grănescu - as well, mainly in the short story *Farmacopiedie pentru inițiați (Calambur)* (Trans. *Enchantopedia for the Cognoscenti. A Pun*). As well as in Ackroyd's novel, where the Guardians make the law, Grănescu's Architects reign supreme. They are the builders of a Burg (a Citadel), a space meant to preserve the illusion of perfection, of the only possible History and Reality: “Arhitecții se cred în sinea lor superiori tuturor celorlați oameni. Arhitecții sunt cei care construiesc Istoria și Realitatea înconjurătoare. Din punctul lor de vedere, lumea se împarte în Arhitecți și actori manipulați, și nici o altă categorie nu își mai are rostul.” (Grănescu 2015: 141).⁶ Ackroyd's Plato is not allowed to lift the veil from his fellow citizens' eyes. They, too, are only aware of one single Reality and one single History. Any attempt to break this illusion is severely punished. Grănescu's Architects' biggest fear is that they may be given away or that they themselves may

6 (Trans.) The Architects believe themselves to be superior to all the rest of the people. The Architects are those who build History and the surrounding Reality. As far as they are concerned, the world is divided into Architects and manipulated actors, and no other category is needed.

be convinced of their own imposed state of delusion: “și spaima lor cea mai mare este tocmai că dacă ar exista cineva care să gândească altfel decât ei, ar exista primejdia de a avea dreptate, și de a-i convinge și pe ei de ceea ce nu vor cu niciun preț să fie convinși, căci zdruncinarea convingerilor lor li se pare cea mai mare erezie...” (Grănescu 2015: 139).⁷

The complexity of *Aporisticon* is a reminder of Borges's genius and non-conformism since Grănescu, just like the Argentinian writer, could envisage the intricate world of black holes or the unstable and difficult to grasp world of quantum physics. We can safely assume that due to the censorship of the time and the controlled bibliography imposed to the reading mass, Grănescu was certainly not among the first to learn about the recent discoveries in the unstable world of particles. Even so, the foundation of some of Grănescu's short stories is built with quantum bricks, while others experiment with quantum ideas. Or, we could simply say that his stories are both quantum and non-quantum depending on the observer. Just to give an example for the latter case, we have the short story *Visul perfecțiunii* (Trans. *Dreaming of Perfection*): “Era în 1980. Aveam o familie. Îmi iubeam soția. Îmi scoteam copilul la plimbare. Etc. O banală viață de familie, ca oricare alta. Cenușă a tuturor existențelor. Potențiale și reale. (Am folosit particula “și” nu “sau”, vă rog să țineți cont de asta).” (Grănescu 2015: 396).⁸ It is the warning in the brackets that informs the reader / observer about the quantum nature of this particular short story, more specifically about the scenario in which two different states are both possible at the very same time just as in Schrödinger's cat experiment.

The theme of the multiverse is to be found in several of his short stories, but we will only focus on several which we consider to be the most representatives. Also, we will differentiate between the scientific multiverse, the one created through the effort of science whether physics or mathematics, and the linguistic multiverse created by language through utterance.

Just like Plato, whether the philosopher or Ackroyd's character, Grănescu too is weighed down by the limiting circle of his existence. He is perfectly aware of his intellectual potential that needs to be tailored to fit the political measurements of the time. We could thus assume that the anguish some of his characters feel because of the realisation of their potential or their imposed limits is actually the writer's anguish. Trauma may be too powerful a notion to be employed in connection with the Romanian author, but his short stories do signal a certain

7 (Trans.) ... and their biggest fear is that if there were anyone to think differently from they themselves, they might be in danger that that person be right and convince them of what they, under no circumstance, want to be convinced of, since to them the shattering of their own beliefs is the biggest sacrilege there could be.

8 (Trans.) It was in the year of 1980. I had a family. I loved my wife. I would take my kid out for a walk. Etc. An average family life, like any other. The remaining ash of all the existences. Possible and real. (I used the particle “and” not “or,” please be aware of this). Is

feeling of angst. Just like Plato, both the real and the invented one, Grămescu does not fit into place.

The **third chapter** focuses on Amis's *Time's Arrow* – given the title we cannot ignore the physical concept of the arrow of time. From our experience, we perceive things as moving in one direction only – from past to future. We remember the past, but we can only imagine the future, not even fully predict it. At a macroscopic level, phenomena follow a clear forward direction, yet at quantum level, physical processes and laws are time-symmetric, meaning that they do not need an arrow of time, they can move forward and backward. There is, however, one exception to this assumption, what is known as Boltzmann's entropy. He also came up with an answer to why the entropy of an object increases when that object becomes an active one. Entropy refers to a lack of order or to the inevitable decay of everything (a house will eventually fall down to pieces, the hot tea in a cup will go cold). Entropy seems to follow the same forward direction as the arrow of time. If entropy increases it is because atoms find more ways of re-arranging themselves. We remember the past and never the future because the future means increased entropy – more possibilities for the atoms, while the past has low-entropy.

If we apply the rules of entropy to Amis's book, then the future should open up more possibilities, the atoms could arrange themselves into so many different ways, and this sounds promising indeed. This is because in Amis's book, thanks to the reversed temporality, the future is the one in which Odilo is an innocent human being who could become anything else but a criminal. To clarify this: the arrow of time flows from past towards the future. In Amis's novel we see Odilo growing younger instead of older – so according to the laws of physics this is not entropy. But it is entropy for the narrator, for the conscience that moves forward and sees Odilo the murderer finally dissipating, becoming atoms that can arrange and re-arrange themselves into something better.

By using the technique of reverse chronology, Amis would like to annihilate the dreadful events of the World War II – the Holocaust. Strangely enough, all acts of destruction become acts of creation. Unlike Vonnegut, Amis chose to focus on the perpetrator only – this may well be because of the print left by a horrific event in his youth – the murder of his cousin by a series criminal and the discovery of this dreadful event only two decades later. Odilo Unverdorben is a monster of self-confidence and a zealous believer in his supremacy over other beings. A perfect soldier, with no conscientious objection, the prototype of the perpetrator.

This portrayal of a perfect perpetrator is what differentiates Vonnegut from Amis since in Vonnegut's case, the line between the perpetrator and the inconspicuous individual is not always visible, and there is frequent trespassing from one camp into the other. Once more, the character

of Howard Campbell Jr. is the best example there can be, which may be due to Vonnegut's war experience and his realisation that the murderer can be a victim and the victim can too, turn into a cold-blood murderer:

Mengel was speaking of Rudolf Franz Hoess, the commandant of the extermination camp at Auschwitz. In his tender care, literally millions of Jews were gassed. Mengel knew a little about Hoess. Before emigrating to Israel in 1947, Mengel helped to hang Hoess. And he didn't do it with testimony, either. He did it with his two big hands. 'When Hoess was hanged,' he told me, 'the strap around his ankles – I put that on and made it tight.' 'Did that give you a lot of satisfaction?' I said. 'No,' he said. 'I was like almost everybody who came through that war.' 'What do you mean?' I said. 'I got so I couldn't feel anything,' said Mengel. 'Every job was a job to do, and no job was any better or any worse than any other.' 'After we finished hanging Hoess,' Mengel said to me, 'I packed up my clothes to go home. The catch on my suitcase was broken, so I buckled it shut with a big leather strap. Twice within an hour I did the very same job – once to Hoess and once to my suitcase. Both jobs felt about the same.' (Mother Night: 10-11).

Amis chose to focus on the perpetrator as a reminder of what could happen if humanity were allowed any forms of excess. He envisaged the time's arrow travelling backward because he wanted to cancel a historical event. This is his way out from a shameful situation that debilitates and devalues the very notion of the human being. Amis toyed with the idea of time travel way before *Time's Arrow*. He did this in the short story "Bujak and the Strong Force or God's Dice" included in the collection *Einstein's Monsters* where he proves to be very knowledgeable on the topic of quantum physics. Amidst the lines of the story, Amis drops personal remarks and confessions that help the reader catch a glimpse of his philosophy: "Now I've grown up a little and realize I have absolutely nothing to fear, except the end of the world. (...) Genocide has had its day and we're on to something bigger now. Suicide." (Amis 1987: 36).

If Amis uses scientific tropes in his works, that is because he lives in an age where one cannot be blind to the discoveries or the happenings of the day. Unlike Vonnegut who is convinced scientific development will inevitably bring with it the perishing of humankind, Amis is not in for a critique of the science, despite the suggestive title of his collection of short stories (*Einstein's Monsters*). He is in because he has to know all there is to know – whether it is new religious beliefs, new particle theories or the secrets of arcade gaming (his 80's passion and

addiction developed in *Invasion of the Space Invaders*). To put it simply: he is a writer of his times.

CONCLUSION

To **conclude**, we have to remember the starting point - the premises that concepts that are to be found in the field of New Physics are used sometimes willingly, other times merely intuitively by various authors, either looking for ways out of various predicaments (mainly a response to traumatic events), or as warning against what could happen when we lose our sanity (quoting Vonnegut's "We are healthy only to the extent that our ideas are humane").

Our analysis is based on six writers belonging to different geographical areas and epochs, but their writings deal with the same topics and propose the same vision or morale – one which blames the suppression of the human spirit. Whenever faced with situations beyond our control, we instantly question the necessity of the acts and our participation or choice as participants to such acts. For instance, natural disasters are not our choice, and despite the injustice, we somehow find solace in knowing that perhaps things were meant to be this way, and that we are not alone in our suffering. Although in mourning, the human spirit will eventually resurrect. But unlike natural disasters, wars are in our control and our participation becomes either a personal choice (immaturity, manipulation, the day's fashion, proving to be a man) or a choice imposed on us. Either way, the human spirit is crushed, the damage is permanent, irrespective of the side we are on.

The two World Wars shattered the human spirit and the belief that we are modelled in God's image. How can this be so, how can a deity be so cruel and nonsensical? The raw, instinctual and animalistic side erupted. Faced with this unprecedented situation literature found two ways of coping – using allusions, temporal disruptions, and in general all sorts of techniques that hinted at the atrocity instead of describing it explicitly, or incorporating the new scientific theories which speculate on the existence of other universes than the one we know. Jago Morrison uses the phrase "something else" when referring to the writers having no other choice but to come up with a new set of aesthetics. To us the 'something else' is the New Physics multiverse: "In the wake of such events – and under the shadow too of the always imminent, nuclear holocaust that hung over the heads of everyone for the majority of the post-war period – it seemed to many writers that a new set of aesthetics was required, whether based on disjunction, allusion, dis-memory or something else, to deal with subject matter that is essentially overwhelming." (Morrison 2003: 23).

As we argue in this thesis, it is Kurt Vonnegut's work that best combines both techniques: the 'dis-memory' and the 'something else'. His 'something else' is the false science-fiction. Science-fiction just happened to be there – the right fiction at the right moment. But it served a purpose; it was his therapy.

A few paragraphs above, we stated that confronted with the atrocities of the Holocaust, literature preferred to hint at rather than describe in detail. At first sight, this does not quite match Amis's *Time's Arrow* given that some of the details there are particularly troubling. But the act of destruction is meant to become one of creation due to the technique of reverse temporality, and this is supposed to balance things out. We are not left with the crime only... And *The Zone of Interest*, Amis's other novel dealing with the Holocaust, is all about allusions and hinting at. We also tried to show that, even if he did not attend any wars, Amis was as troubled as Vonnegut was, and used the phrase trauma through empathy to refer to his special case.

However, our proposed objective - that using the multiverse in fiction is a response to trauma - is not linked to the Holocaust or the war trauma only. Or, if linked to the Holocaust, the perpetrator's trauma should also be acknowledged. We do this when analysing Amis's *Time's Arrow*, firstly because Amis himself chose to focus on perpetrators, and secondly because the more recent Holocaust studies acknowledge it as well. As shown in the thesis, we found Amis's perpetrator's situation rather complex and complicated, because there is a double interpretation: the perpetrator's deeds can be justified in light of the historical context, but they can also be seen as stemming from an obscure evil predisposition.

Borges and D.R. Popescu did not particularly refer to the Holocaust in the works we have analysed. They refer to war as a prototype – it can happen anytime, anywhere, the technology may be more or less advanced, the parties involved more or less numerous.

But wars seem to be as old as the human race itself – Kubrick's *2001: A Space Odyssey* depicts the evolution of the human race as stemming from such a conflict – an ape-man killing another ape-man. No longer imagination, we now know that the tribes of the past that we like to associate with an idyllic scene of peaceful life spent in nature's bosom were extremely violent and cruel, that they tortured and killed as part of the day's routine. It is a pessimistic vision, but it looks that humankind needs more centuries to truly become humane. Once more, the authors analysed share the same vision of wars that degrade our species. The opposite of meek, they refuse to accept this scenario and fight against it with intelligent weapons that create worlds in which there are victims and traumas and despair, but also searches for a way out which may be utopian, imaginative but not devoid of some cathartic effect of sorts.

It is not just wars that are responsible for traumas. The triggers may be different, but traumas share common traits among which temporal distortion, suppression of memories or selective memories. Ackroyd's and Grămescu's fiction do not revolve around wars as in actual combat, or the Holocaust. Their wars are more discrete and involve parties and systems of thinking. It is a war against a system that, just like the field combat, crushes the human spirit by denying its individuality. Plato, from Ackroyd's novel, is a misfit conducting a battle of ideas. He is exonerated in the end, but imposes an exile on himself, since he cannot accept the compromise.

Ackroyd's novel is written in the best New Historicist style. The novelist cracks down on metanarratives, such as the continuous evolution of humanity through time. In *The Plato Papers*, the succeeding ages live within closed in epistemological paradigms which do not emerge out of previous ones, nor do they open to future developments. There is a radical break between one age and the next, each new generation commenting ironically on the predecessors' stupidity – to the extent that they get access to documents which are always fragmented, corrupted, combined in random ways, leading even philosophers to hilarious conclusions.

In Grămescu's case, the battle against the system functions more at a personal level, than at those of his characters. The communist regime, the real one, is like Ackroyd's imagined future London in which people are kept within strict boundaries, told what to think and what to do. But free, visionary spirits will always find a way out, hence the resort to new worlds and universes. Plato travels to the Underworld, Grămescu's characters access other dimensions. Both writers insist on the idea that their travel does not necessarily imply a change of boundaries; they access the worlds from the world they are already in (see Grămescu's *Simfonia Viitorului* – trans. *Symphony of the Future* or *Formula –The Formula*).

Thus, we cannot ignore the allusions to the black holes that are portals to other universes. Nor can we ignore the brilliant minds behind these writings, their struggle, passion and dedication. It takes courage to write about a possible black hole opening a new universe (Grămescu) when one's written pages are scrutinized by the censorship committee. It takes courage to resort to what is normally seen as science-fiction to warn humanity of the past mistakes and the ones to come (Vonnegut). It takes courage to speak about the Holocaust as if it were an act of creation (Amis), and it takes courage to be a writer when going blind (Borges). We are pretty convinced that the writers' resorting to the New Physics concepts was not always intentional or carefully selected. It was rather intuitive – using what was close at hand and what fell into place. But it is the scientific and the interdisciplinary approach (used intentionally this time) that offers the most complete understanding of the writings analysed. Otherwise, sentences

that speak about the universe forking in time, Paraschiv being both dead and alive at the same time, Plato's belief in two realities existing simultaneously, would be wasted on irresponsible readers. Throughout our study we have tried to analyse each such instant that offers an opportunity for a quantum interpretation. Possibilities still exist and perhaps future interpretations will open new portals of analysis and new meanings.

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