Science *and* Literature: Poetry *and* Prose

Edited by
Kostas Tampakis, George N. Vlahakis

Language editing and formatting
Evangelia Chordaki

DIGITAL PUBLICATIONS 08

ΙΝΣΤΙΤΟΥΤΟ ΙΣΤΟΡΙΚΩΝ ΕΡΕΥΝΩΝ | ΕΘΝΙΚΟ ΙΔΡΥΜΑ ΕΡΕΥΝΩΝ
INSTITUTE OF HISTORICAL RESEARCH | NATIONAL HELLENIC RESEARCH FOUNDATION

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INTRODUCTION
THE POWER OF NAMES

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"What is left of the rose is only its name; we keep naked names" laments the 12th century Benedictine monk Bernard of Cluny in his satirical poem *De contemptu mundi*. Eight centuries later, the Nobel laureate Umberto Eco used this verse to remind us of the power of names, in the eponymous 1980 book *The Name of the Rose*. What is in a name, then? What does literature mean? The *Oxford English Dictionary* – in itself a hybrid of Science and Literature – tells us that 'Literature' is "pieces of writing that are valued as works of art, especially novels, plays, and poems". This is a powerful definition, containing a lot of powerful names in itself. We thus thought it fitting to name the second volume on Science and Literature, *Poetry and Prose*. The emerging theme of the volume is indeed all kinds of written works of art, and certainly novels, plays and poems. What would be a rather pedestrian view of literature acquires further depth when considered through its interaction with the physical sciences. Other scholars take up the question of parallel strategies used by scientists and novelists, or even of similar modes of expression and identity formation in scientific and artistic circles. Once again, a plethora – do we dare say cornucopia? – of ideas and questions open up, which only just barely tolerate characterization.

This volume is organized around two themes, *Poetry* and *Prose*. Poetry emerges as a locus of research with Pauline Choay-Lescar essay, which brings forth in her essay the geographical components of Walt Whitman's (1819-1892) biography, taking as her poems *Leaves of Grass*. Simone Palmieri tackles metrical and rhyming structures in Italian advertising. Marion Simonin carefully examines the various iterations of the strange and powerful poem *The Fourth State of the Material* by Lorand Gaspar, while Io Stephanidou revisits the poetry of Emily Dickinson (1830-1866) to identify scientific fragments, taking her cue from Janet Malcolm's books. In these essays, rhymes and lyrics are shown to be more than artistic expressions, but also gateways to usually unlooked for connections to many human endeavors. Kostas Tampakis discusses the case of Theodoros Orfanidis (1817-1886), a poet famous at his time, but also the Professor of Botany in the University of Athens. In the final seventh essay of the first section, Maria

Terdimou brings us back to the present, and examines the use of zero and infinity by contemporary Greek poets.

The second section contains essays which discuss *Prose*, on all its artistic iterations. Constantin Canavas analyzes the narrative of Italo Calvino's *Comicomics*, which has been strangely neglected so far by Science and Literature scholars. Evangelia Chordaki breaks new ground by bringing gender and feminism under the aegis of the topic, through her essay on the circulation of medical knowledge in the late 20th century among feminist circles. Manolis Kartsonakis revisits the literary production of the Scientific Revolution, and brings to the fore the rhetoric strategies of such luminaries of science, as Copernicus, Kepler and Galileo, while Gianna Katsiampoura tackles one of the most popular genres, that of the crime novel, and discusses the role of science and of the scientist. Constantinos Morfakis and Katerina Vlantoni analyze how science and technology interact in Henrik Ibsen's (1828-1906) *An Enemy of the People* (1882). Roula Tsitouri explores the existence of Aphasia in Samuel Becket's work. Michael Wainwright takes us to the beginning of the 20th century, by discussing the towering work of William E. B. Du Bois (1868 - 1963), and especially his seminal book *The Souls of Black Folk* (1903). Finally, Anne-Gaëlle Weber goes back even further, in order to highlight the many ways scholars used literature in the 18th and 19th century and George Vlahakis provides the final ninth essay of the section, by examining mesmerism in 19th century Greek popular literature.

As is true with its sister volume, *Imagination*, *Medicine and Space*, this volume also contains a multitude of voices, narratives and approaches. Some of them once again challenge the limits and norms of academic discourse. But it would be worth to mention that, while the two volumes are siblings, they are by no means joined at the hip. Nor are they to be seen collectively as a full map of the diverse field that is Science and Literature. In our mind, there is no academic continuum that can be described as 'Science and Literature'. Instead, we see it is an expanding space of differing approaches, some parallel, some diverging, and at times, paradigmatically incommensurable. This is, we content, where the true strength and fruitfulness of this endeavor lies. Thus, we did not set to map it or name the various components of Science and Literature, like Abrahamic Adams and Eves in a Garden of Eden. If anything, we rather wanted to explore this new territory's vistas and gaze at its forbidding mountains. We do hope that the essays contained in this volume will intrigue the reader enough to come and join us. Umberto Eco, in his "Postscript to the Name of the Rose" (1984), discusses the dissensions that the name of his book created, and sardonically declares that the authors should die after they finish their work, to avoid sowing confusion. Luckily for us all, he did not follow his own advice. Perhaps in some years from now, there will be even more essays on the subject, and we could follow his example, but not his advice.

Poetry

GEOPOETRY IN WALT WHITMAN'S *LEAVES OF GRASS*

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Université De La Sorbonne Nouvelle

What characterizes Whitman in *Leaves of Grass* is a double movement of expansion into the world and retraction into the self and into the book. Whitman is at the same time a geograph writer who territorializes his writing – he uses the outside world to build his poetry – and also a postmodern writer who lives within the confined space of his own book.

I propose here to examine the link between these two movements or how Whitman uses various natural sciences –such as geography (the observation and description of the world and of its inhabitants), geology (the knowledge of its components) or biology (the study of life) – to build his cosmic poetry.

So I will first show that the link between the illimited universe which the poet observes and explores and the limited world of the book *Leaves of Grass* is the leaf of the book, which leads to the map.

From then on, I will show how he inscribes himself into space by inventing a genealogy of his own origins – a mythical map of his own origins.

And finally, how he proceeds with the creation of the American territory itself – by endorsing the personae of the navigator – mapping the world and linking spaces, thus finally annihilating all borders between the world, himself and his book.

The motionless explorer

Whitman is a great observer of the world, despite the paradoxical fact that he has hardly moved in his lifetime. He is at the same time an observer of the infinite spaces surrounding him, from the sky to the earth (see the numerous verbs and terms of perception sprinkled all over his poems), but also a motionless writer who has spent most of his life in the same place (Long Island, Brooklyn and Manhattan first, then Washington DC, and finally Camden, New Jersey) – with a very few exceptions such as his memorable trip to New Orleans in 1848. This trip deeply marked his imagination but, as a critic says

"it was in the hospital wards (i.e. Washington DC during the Civil War) that he really traveled the US and crossed boundaries otherwise not easily crossed"

> While I have been with wounded and sick in thousands of cases from the New England states, and from New York, New Jersey and Pennsylvania, and from Michigan, Wisconsin, Ohio, Indiana, Illinois, and all the western states, I was with more or less from all the states, North and South without exception ('Tis But Ten Years Since (Sixth Paper.)". per.00215 . Walt Whitman Archives).

Hence the idea of a motionless traveler who in a way discovered the geography of his own country through the amputations and wounds of the American soldiers he was tending. And hence also his poetic project whose goal resides in the re-union of all the states, the "re-memberment" of what had been dismembered.

But Whitman did not only live in the confined space of a determined place but also and mostly in the confined space of his book. We mustn't forget that he started as a typograph and that typographic characters – as words - remained very concrete and important for him throughout his life. He therefore constantly reminds the reader that they are meeting over a sheet of paper: "you up there, lift me close to your face" (LoG 1856, 242)[1], and that he "was chilled with the cold types and cylinder and wet paper between us" (LoG 1856, 121). For Whitman, the body and the book are interchangeable entities, the act of writing is as physical as it is intellectual and words are similar to objects thus linking him to the French poet Francis Ponge and also to French writer George Perec who wrote, in lines that could have been written by Whitman himself: "J'écris. J'habite ma feuille de papier, je l'investis, je la parcours"[2]. What's interesting here is that the page, the leaf (and therefore the book), has become a place to inhabit and that finally we find the same geographical terminology in the world and in the book showing the connection between space and language.

Now, it seems that the link between the infinite space of the universe and the limited page of the book (between space and language) is the Map**,** from the Latin *Charta* – and the ancient Greek *Kartes* – which means paper, book. Originally*, Charta* was a light cardboard composed of several leaves assembled or glued together. So, *Leaves of Grass* would not only allude to the leaves of the book and the organic leaves of the world, but also to a geographic map. And indeed, *Leaves of Grass* is both limited and illimited, a limited and evolving representation of an illimited universe, a map which the poet draws and dreams and a book in which he lives.

Yet, according to Michel de Certeau, a French philosopher who has written extensively on the subject of maps and who proposes to read space as a language, the modern map which supposedly allows us to apprehend the real world, can nevertheless never be

1. Except here, all the other quotes from Whitman come from the Norton 1973 edition.
2. "I write. I inhabit my sheet (leaf) of paper, I invest it, I roam through it." (Pérec 1997, 19)

considered as "a fragment of the real" (Delacroix, Boureau 2002, 226). As in the case of language (and it is in a way analogous to language), it must be regarded with wariness. And indeed, by representing – or projecting - in two dimensions a complex three-dimensional object, reality is necessarily distorted. Representation is distortion and interpretation. And it is precisely in this distortion, which is very personal that lies poetry i.e. in the transformation of a referential space into a fictional one. Once again, we cannot but think of another French writer Julien Gracq, who, as Whitman, uses geography in a lyrical and poetical way and for whom the map is a magical object, a source of dreams[3].

Origin of the self/Origin of the world – geobiology and mythology

This mythical/magical dreamlike quality of geography in general and of the map in particular can be seen for instance in Whitman's account of his origins.

In *Leaves of Grass*, everything starts from I and ends with I (or You). And since it is through I, through his body that the world can be apprehended, (the geographer Jacques Levy would speak of an "ego-geography") the first thing that must be done therefore is some kind of genealogy of his own origin, or the inscription of his own being into space: in a sort of "bodygraphy", he delineates and draws the contours of his own being, thus acquiring some kind of historical legitimacy.

For Whitman, his own origin goes back to the origin of the world, with the emergence of the first life forms from a nebulous vagueness as he says in "Song of Myself" (s. 44, l. 1152-53, 81):

> Afar down, I see the huge first Nothing, I know I was even there,
> I waited unseen, and always, and slept through the lethargic mist,
> And took my time, and took no hurt from the fetid carbon.
> (...) Immense have been the preparations for me....

He inspired himself from the science he read in public libraries, summing up Darwinian theories in a few lines, fusing the sciences of geography, geology and biology into one to explain the emergence of living organisms – himself - from lifeless matter. The poet therefore inscribes himself at the origin of the world, "when the reeking atmosphere was charged withcarbonic acid**,** nitrogenized compounds, phosphorus (...)" (Pereto, Bada, Lazcano 2009, 399). Talking of the human body he says in "I Sing the Body

3. See for instance Gracq 1951, which led a critic to write: "Avec *Le Rivage des Syrtes*, Julien Gracq a écrit un imprécis d'histoire et de géographie, à l'usage des civilisations rêveuses" (Antoine Blondin, "Rivarol", 6 Décembre 1951). "With *Le Rivage des Syrtes*, Julien Gracq has written an unprecise précis of history and geography for the use of dreamy civilizations".

Electric" (s. 7, l. 99-101, 98): "For it (the body) the globe lay preparing quintillions of years without one animal or plant/For it the revolving cycles truly and steadily rolled."

This vision of his body emerging from the initial chaos and evolving for millions of years is both scientific and imaginary. As the poet admits in "Passage to India", (s. 2, l. 19-20, 412): "Not you alone proud truths of the world/Nor you alone ye facts of modern science,/but myths and fables of eld, Asia's, Africa's fables/The far-darting beams of the spirit, the unloos'd dreams". Science is mixed up with mythology, thus creating a new cosmogony where time and space are fused, and where the elemental principles, are genderized ("here lands female and male"): from their union springs forth a new world, timeless thus immortal.

So, legend ("fable") – as is often the case - is here used to support science. But legend does not only allude to myth but also to the legend used to read a map, i.e. "the wording on a map or diagram explaining the symbols used", according to the dictionary. In a way we are presented with a scientific map of the origin, with all the primal elements named and present (the earth, the sky, the sea, the sun, the stars...), a primordial map of the universe, but which can only be read through the prism of a legend, the poet's own personal legend. Besides, we mustn't forget that *Legere* means to read in latin and that *legenda* means "what must be read". The word "legend" came to mean either an explanatory inscription as we just saw, but also stories to be read for the edification of the people, a sort of hagiography of saints. And here, once again, we have an association with Whitman who, throughout his life, kept promoting himself and his work. He doesn't only offer us a map of his origin, together with his own personal legend: this legend is also exemplary and is there for our edification.

It is therefore with this gigantic cosmogony in the background that Whitman can order the geographic space of his poems. As he says in "Starting from Paumanok": "I will trail the whole geography of the globe" (s. 6, l. 84,19).

The explorer

In order to achieve this ordering of space, the poet embodies the personae of the explorer/traveler whose task is to name and map the world on the one hand, to link and unite it on the other hand. "On journeys through the States we start/ sailing henceforth to every land, to every sea" proudly announces the poet in "On Journeys Through the States" (l. 1-3, 10).

Whitman compares himself to the explorers of the past - especially to Columbus discovering the new world (In "Prayer of Columbus"). He constantly uses sea/spatial metaphors, once again demonstrating the continuity between the experience of space and language: the poet is the famous navigator and his songs are like ships, allowing us to pass from "shores we know" to "unknown shores", "unknown" meaning both "yet

undiscovered" (i.e. a new form of poetry) and the access to a new spiritual ideal. Words alluding to navigation (like "magnet", "sextant") are frequent in *Leaves of Grass*, such as in "Passage to India", where he writes:

> The plans, the voyages again, the expeditions;
> Again Vasco de Gama sails forth,
> Again, the knowledge gained, the mariner's compass" (s. 4, l. 75-80, 414).

Like Amerigo Vespucci, Columbus, or Vasco de Gama and the various naturalists, astronomers, entomologists, geologists etc. who accompanied the great explorers - the poet's task, is to observe the world, to collect as much information as he can, and to draw all sorts of maps: geographical, topographical, geological, botanical, zoological, but also maps of the populations, historical maps, memory maps**,** in order to give us a global vision of the earth and of his own imaginary space.

Mapping

As the primitive conjurer, it is through the act of naming (which is the linguistic equivalent of mapping) that Whitman can achieve this task. Naming is fundamental and links the poet to a great scientist, Linneaus, who revolutionized the world by introducing the Latin binomial nomenclature where every living organism is identified by genus and species: thanks to him, names were stabilized and for the first time, humanity was offered a common language. So, by cataloguing America, by transforming it into words, the poet authenticates/stabilizes its/his existence since what has no name, has no existence. As the French poet Yves Bonnefoy said: "Le vrai lieu n'existe pas sans le nom du lieu. Le nom est le génie du lieu." (Bonnefoy 2000, 9-27, 23)[4]

Whitman proposes a physical description of the American continent, not only naming each state in endless catalogues, but also describing their topography, (with their mountains, deltas, hills, and rivers), their geology (gold, coal and iron, gneiss schist, granite, copper, lead, tin, zinc ...) and their production (cotton, sugar, rice, wheat...). See for instance a poem like "Starting from Paumanok", where each state mentioned is linked to a natural element or an activity: "the mines in California", "the woods of Dakota", "the flowing Missouri" (s. 14, 24). In "Our Old Feuillage" also, the poet tries to analyze the specificity of each state or region – "the green peninsula of Florida", "the priceless delta of Louisiana", "the cotton-fields of Alabama and Texas", "the silver mountains of New Mexico", "the valley of the Potomac" or "the hills of the Adirondacks" (171-16).

4. "The real place doesn't exist without a name. The name is the *genius loci,* the spirit *of* the place".

The physical description of the various American states also includes the vegetable and animal realms which are depicted very carefully and scientifically as in their context, laying particular stress on the elements linked to his poetry, namely the grass and the plants, as in "Our Old Feuillage": "the red cedar festooned with tylandria, the pines and/cypresses growing out of the white sand that spreads far/and flat", (l. 27, 172) or in "Song of Myself": "over the western persimmon, over the long-leav'd corn, over the/delicate blue-flower flax…" (s. 33, l. 727, 62). The animals are also very important, depicted with great realism and always linked to a particular context such as in "Song of Myself" for instance:

> Where the rattlesnake suns his flabby length on a rock, where the
> otter is feeding on a fish,
> Where the alligator in his tough pimples sleeps by the bayou,
> Where the black bear is searching for roots or honey, where the/beaver pats the
> mud with his paddle-shaped tail (s. 33, l. 722-25, 61).

Yet the most accurate descriptions are those of the American birds - " the humming bird" "the long-lived swan", "the laughing gull", "the yellow crown'd herons", "the band-neck'd partidges" ("Song of Myself", 63), "the mocking bird" and the "the hermit thrush" ("Our Old Feuillage", 173-175). His descriptions are almost those of a naturalist: indeed, ornithology had become very famous in America in the 19th century thanks to the works of Alexander Wilson and mostly of Audubon ("ce Buffon de génie" as the French poet Lamartine called him). Whitman was well aware of that trend and tried to be as true to life as possible, going as far as to imitate the music of nature and particularly that of birds. The lines of "Out of the Cradle Endlessly Rocking" for example, are a transcription, through phonetic symbolism or imitative harmony, of the bird's song.

So, Whitman provides his reader with a good overview of the physical geography of America and, to a lesser extent, of the globe but he also deals with human geography, endlessly naming, enumerating and describing the populations of America (for example "the Pennsylvanian", "the Virginian", "the Double Carolinian" "the Louisianian", "the Georgian", "the Missisipian", "the Arkansian" (…) in "Starting from Paumanok, s. 14, 24-25), their physical appearances, moral accomplishments, social behaviours, trades, covering all the social spectrum. He also links the inhabitants to their living places, showing that inhabitants and territory are built in the same mould: they are defined by their territory and they define their territory, pointing to the total porosity between the two. So by enumerating the various inhabitants of the different states of America, Whitman manages not only to create a sort of perfect democracy, where the president and the slave coexist on the same level (as he declares "I will not have a single person slighted or left away", 44). but also to depict a unified country, thus achieving through his poems what the war eventually achieved through blood.

But Whitman doesn't content himself with defining the present American space: he also deals with the past, offering us a spectral map of America through his repetitive use of Indian names, celebrating the way "the red aborigines" "charged the water and the land with names" (Starting from Paumanok", s. 16, 26) and thereby allowing us to have a glimpse into another space time. In "Starting from Paumanok", it is interesting to listen to his incantatory enumeration of Indian cities whose names possess a strange suggestive power: "Okonee, Koosa, Ottawa, Monongahela, Sauk, Natchez, Chatta-/hoochee, Kaqueta, Oronoco,/ Wabash, Miami, Saginaw, Chippewa, Oshkosh, Walla-Walla (...)" (s.26, l. 243-4, 26). Through the music of this ancient American cartography, Whitman wants us to hear the original voice of nature to which we have become deaf and to see this primitive America to which we have become blind ("a world primal again", as he says in "Starting from Paumanok", s. 17, l. 248, 26). And, again, we find the same association between language and space.

Eventually, Whitman manages to draw a huge map of America, delineating borders and defining a precise territory, both accurate and personal. But as I said, the other role of the explorer is to link and unite the world. Defining territories and uniting the world seem contradictory processes: in fact, they are complementary and part of Whitman's s strategy to achieve a certain form of unity.

Linking

Just as Whitman offers us a map of a long gone America whose echo can still be heard in the music of names, he also offers us at the other end of the spectrum, a vey modern picture of his country, where the earth is "spanned, connected by network,/ the oceans (...) crossed, the lands (...) welded together..." ("Passage to India", s.2, l. 30-35, 412) and where the poet celebrates the feats of the modern engineers: the construction of the Pacific railroad and the opening of the Suez canal, the cables in the Atlantic and the Pacific. The engineers, architects and scientists are those who will build the world of the future. Thanks to them, the earth is expanding, the borders are annihilated, the peoples of the world are united. In fact, he compares the engineers to the explorers of the past, the inventors of the marine routes: as the poet himself, who embodies the idea of passage, from one continent to another, from the earth to the skies and from himself to his reader, they are like new Vasco de Gama, linking the continents, welding the lands with railways, ferries and other steam machines. Just as the poet leaves his inscription, his mark in the leaves of his book, so the engineers leave theirs in the earth which, all over the world, is branded with their new inventions. Moreover, this notion of bridging, of linking, is counterpointed by that of speed, symbolized (as in futurist writings, from Marinetti to Mayakovski) by the locomotive which allows to "speed off in the distance" ("A song of Joy" l. 12, 177) and therefore to transform/distort the idea of

space and time as in today's anamorphic maps. Indeed, the map in this case no longer represents a geographic reality, but the altered reality of a phenomenon, being here the acceleration of time. As Whitman says, talking about the positive aspects of these new inventions: "the distant is brought nearer" ("Passage to India", s. 2, l.34, 412). Hence, thanks to the modern machines, we are presented yet with another vision of America, where time and space are distorted and where the poet manages to reach the time of his future readers, uniting and linking the past to the present.

If this notion of linking announces the future and modern times, it might also be the sign of a scientific reflection: how can we understand the world if each item is taken individually?

The world is a puzzle so says the poet, and it is only by assembling and linking its elements that a meaning will emerge. And here, we cannot but think of the words of a great geographer Vidal-Lablache who wrote in the Preface to his *Atlas Genéral* that his aim was to

> placer sous les yeux l'ensemble des traits qui caractérisent une contrée afin de permettre à l'esprit d'établir une liaison. C'est en effet dans cette liaison que consiste l'explication géographique d'une contrée. Envisagés séparément, les traits dont se compose la physionomie d'un pays ont la valeur d'un fait; mais ils n'acquièrent la valeur de notion scientifique que si on les replace dans l'enchainement dont ils font partie et qui seul est capable de leur donner leur pleine signification.[5]

In a way, this is precisely what Whitman had in mind when he talked about parts and whole, "I will not make poems with reference to parts,/But I will make poems, songs, thoughts, with reference to ensemble, And I will not sing with reference to a day, but with reference to/ all days"" ("Starting from Paumanok", s. 12, v. 172, 23). It is by superimposing all the different information he gives us about America that we will begin to understand what America is – or rather what he and his America look like. This desire of wholeness is also what explains his extensive use of catalogues. Indeed, in spite of their length, the catalogues are a form of poetical understatement: being unable to give an extensive description of America, Whitman gives us glimpses, allowing us to fill in the missing parts. They are also metonymies where each part, or each verse stands for the whole. So, in a way, we can contemplate the whole picture, as Wordsworth in the *Prelude*, who saw "parts as parts but with the feeling of the whole" (Wordsworth [1805] 1933, 124).

5. "To place under the eyes the totality of the traits that characterize a given country in order to allow the mind to establish links between the different parts. It is precisely in this link that lies the geographic explanation of a country. Taken separately, the traits that compose the physiognomy of a country are mere facts. They acquire a scientific value only if they are replaced in the sequencing pattern to which they belong and through which only will emerge their full signification" (Vidal-Delablache [1894] 1938).

Finally, and this will be my last point, the notion of spanning, and linking, bonding serves to unite all the elements of the world and to achieve unity. But this notion can also be applied between the world and the book on the one hand, the book and the body on the other hand. Through the linguistic appropriation of the world, the whole geography of the globe is contained within the pages of the book. And since Whitman repeatedly tells us "camerado this is no book, who touches this touches a man", we can infer that his book and his body are one and the same. Therefore, the Whitmanian I appears as a huge belly who needs to absorb, swallow and digest the world in order to exist. And indeed, "Absorbing, swallowing, digesting" are recurring words in *Leaves of Grass.* "All this I swallow, it tastes good, I like it well, it becomes mine" says Whitman in "Song of Myself", offering the image of the ogre poet gulping down the world with his "omnivorous lines" ("Song of Myself", s. 42, l. 1085, 77). Each natural element is considered as a potential nutriment. Eventually, he depicts himself as the great absorber of the world: "I find I incorporate Gneiss, coal, long-threaded moss, fruits, grains" ("Song of Myself", s. 31, l. 670, 59), becoming a sort of Arcimboldian figure, made of multiple elements, without any proper identity, save that of the fusion between the different objects of the world.

The world is inside him as he says in "Salut au Monde" ("Within me latitude widens, longitude lengthens", s. 2, l. 13, 137), ready to be absorbed in its turn by the reader. And, indeed, those are the concluding words of the 1855 Preface: "The proof of a poet is that his country absorbs him as affectionately as he has absorbed it".

Whitman was finally and belatedly absorbed by his country, as he himself had absorbed it so passionately. So much so that today, *Leaves of Grass* has almost become a metonymy of America.

References

Baron, Christine. 2011. "Littérature et géographie: lieux, espaces, paysages et écritures." *Fabula-Lht* n°.8., "le partage des disciplines.".

Bonhomme, Béatrice, 2004. "La poésie et le lieu." *Noesis* (en ligne) 7.

Bonnefoy, Yves. 2000. Entretien avec Béatrice Bonhomme sur "La poésie en français." Nice, revue *NU(e)* n° 11, 9-27. Consacré à Yves Bonnefoy.

Collot, Michel. 2014. *Pour une géographie littéraire*. José Corti.

Delacroix, Christian & Boureau, Alain. 2002. *Michel de Certeau: les chemins d'histoire.* Editions Complexes.

Gracq, Julien. 1951. *Le Rivage des Syrtes.* Editions José Corti.

Pérec, Georges. 1997. *Espèces d'espaces* Paris: Galilée.

Pereto, Juli, Bada, Jeffrey L. & Lazcano, Antonio. 2009. "Charles Darwin and the origins of life." *Origins of Life* 39(5): 395-406.

Vidal-Lablache. 1938 (1894). *Atlas Général.* Préface de la 1ère édition. Armand Colin.

Whitman,Walt. 1973. *Leaves of Grass*. Edited by Sculley Bradley and Harold Blodgett. New York: W.W. Norton & Co.

Whitman, Walt. 1856. *Leaves of Grass 1856*. New York: Fowler and Wells.

" 'Tis But Ten Years Since (Sixth Paper)", per.00215 *Walt Whitman Archives*. Edited by Ed Folsom and Kenneth M. Price. Center for Digital Research in the humanities.

Wordsworth, William. 1933 (1805). *The Prelude*. London: Oxford University Press, Bk.VII.

A SURVEY ON THE FUNCTIONALITY OF METRICAL-RHYMING STRUCTURES IN ITALIAN ADVERTISING

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Introduction

The history of the relationship between advertising and poetry has very old origins[1]. It began officially at the dawn of the nineteenth century – when goods were advertised by means of verses, proverbs, nursery rhymes and rhymed dialogues[2] – and has continued up to the birth of the World Wide Web.

Even today, in the internet age, despite having completely changed[3], when it comes to selling products and services, marketing experts certainly do not forget using language games. *Jingles, ditties* and *contrafacta4* are expedients that another mass-media has also resorted to long before the digital age: television. Unlike all its precursors[5], TV appeared as the most intrusive means of communication, capable of broadcasting an enormous amount of information on a large scale and in real time. But its potential did not end with the transmission of news. It soon became clear that this tool made it possible to influence the thinking of the masses, manipulate needs, influence the sale of products,

1. Which can be traced to the political propaganda of late antiquity (one thinks of the *Æneis*, I century B.C), and in the literary works of Europe's Middle Ages. The Provençal troubadours, for example, were wont to compose verses of praise or criticism addressed to their lords. In this regard, Paolo Canettieri and Karen Klein have stressed the similarities between the poem of arms and today's political propaganda, both based on the reprise of the already familiar rhythmic-melodic modules, in order to "[...] favor the propagation and the affirmation of an idea" (Santini, 2007).
2. Famous instances are Warren shoe polish and Packwood razors, as well as the campaign for the Sapolio soap "Spotless Town".
3. Today's advertising communication has substantially different features than those that distinguished it just a few decades ago. Thanks to the powerful medium of internet, advertising has become more concise and aggressive, and ads have taken on a different appearance depending on the channels used (one thinks of the web pages full of pop-up and pop-under banners; the spam that daily clogs our emails, the Cambridge Analytica scandal regarding the use of sensitive data drawn from Twitter, Facebook, Instagram and Tumbrl accounts).
4. In vocal music, this term refers to the repetition of a pre-existing melody on which a completely new text is sung. A procedure that, according to Giovanna Santini, a professor at the Faculty of Studies of Tuscia, "covers the entire western poetic tradition from the Middle Ages to the present day" (ibid).
5. The vocal messages, poster and print format announcements, radio advertising and film propaganda.

increase industrial production, and (why not?) determine a candidate's victory in political elections. All through the incessant broadcasting of simple thirty/forty-second press releases. Given their brevity and the uniqueness of the medium in which they were transmitted, TV commercials were able to overcome the barriers imposed by the usual communication *channels*, for example by combining the verbal component of a message with the visual component of the image. In other words, television advertising was able to add the potential of image, sound and acting to the persuasiveness of language. Precisely for this reason, analogical TV spread rapidly as early as the 1930s, to establish itself as a means of mass communication, first in America and then in the rest of Europe. In Italy, television, as a cutting-edge tool of political and commercial propaganda, boasts a long-standing tradition. This is attested by *Carosello*, a television show that just one year after it was introduced (1957) became highly successful, [6] marking the imaginary of an entire generation[7].

The program, broadcast by RAI[8] (*Radio Televisione Italiana*), was unique in its kind as a container for comic sketches and musical interludes with commercials, combining entertainment and business, a means to entertain the masses and at the same time function as a springboard to promote commercial items; products that, like the goods advertised in the nineteenth century, were hawked by nursery rhymes and language games. The *Montana* canned meat commercial, a sample of which is presented below, is just one example – perhaps the most captivating – of the type of advertising that was broadcast during the RAI programming. Beyond the reference to the film genre of that age – the spaghetti-western – the appeal of this ad was determined by many factors: the alienating effect of the brand, which was both the product name and its precise geographical location[9]; the hero of the story, Gringo, a cowboy who acts as the imaginary testimonial for the canned meat; the animated cartoons that make his adventure visible; the music and sound effects that accompany his feats; and, lastly, the plot, full of climaxes, which appears as a parody of western fiction. Like the adventures of the solitary gunslingers, Gringo's too are based on the narration of a conflict – his being with the fearsome outlaw Blackjack – that changes from one ad to another, like the episodes of a TV series. But the clashes between the two characters are not simply narrated: they follow a singsong rhythm, punctuated by rhymes that capture the listener's attention till the end of the story. Transcribing the contents of the headline and stopping at each rhyme to go back to the beginning, we note that the story takes on overall a particular

6. The format had an audience of about "four and a half million people, at least two or three times a week" (Codeluppi 2013, 97).
7. That of the baby boomers, i.e., those born during or soon after WWII. The expression used to announce the end of the transmission, "After Carosello, everybody off to bed!" became a motto that is often repeated even today by members of this generation.
8. Rai, Radiotelevisione Italiana S.p.A., is Italy's exclusive public radio and television network, officially founded in December 1945 by the union of the Italian radio system.
9. "Montana" refers to the U.S. State of the same name and to its colonial past.

form: six stanzas of six lines each, to which another one of four is added in the payoff. Then, by calculating the number of syllables within each verse, we note the repetition of twelve syllabic feet, with fixed accents on the second, the fifth, the octave and the penultimate syllable[10]. This particular metric structure is not just the result of a hindsight textual reconstruction. Its use is actually attested in the history of European poetry and dates back to the work of fifteenth-century Spanish poets[11], later reprized in romantic poetry, "a continuation of the legacy of folk-song odes and eighteenth-century melodrama" (Beltrami 2011, 203). In Italy, the first to have adopted it was Alessandro Manzoni, to give voice to the main chorus[12] in *Adelchi*, and, with the advent of *free verse*, many Italian poets were inspired by its form while modifying its rhythm.

(It.)	(En.)
Quaggiù nel Montana, tra mandrie e cowboy	Down here in Montana, among the cattle and the cowpokes
c'è sempre qualcuno di troppo fra noi.	there's always one too many of us.
Black Jack ha assaltato la banca, e da dritto	Black Jack's robbed the bank, and straighta-
ha sparso la voce che fu il sottoscritto	way spread word that it was yours truly
Per cui a fuggire braccato mi accingo,	So I need to plan my escape from the poss,
però me la paga! Parola di...Gringo!	but he'll pay for it! Word of... Gringo!

So, the *Montana* company shaped its ad on a metrical structure widely documented in the literary tradition. But for what purpose and, above all, why exactly a *verso de arte mayor*? Unfortunately, we cannot know if the dodecasyllable reprise is part of a precise marketing strategy or whether it is the creative fruit of the copywriter. On the other hand, we know that this is not the only case. The same phenomenon would come forth if we transcribed the content of other ads[13] broadcast in this period. For instance, the advertising for *Ducotone14* paint used a rhyming octonary couplet, a metrical structure that

10. These are *dactylic symmetrical dodecasyllables*, formed by two esasyllabic hemistichs with the first syllable in anacrusis. The metrical scheme of the symmetrical dactylic dodecasyllabic answers to the following model: anacrusis + dactyil + trochee // anacrusis + dactyl + trochee (ex.: Down here in Montàna, amid the herds and cowboys).
11. Among these is Juan de Mena, as the first writer who used dodecasyllables in his allegorical poem *El Laberinto de Fortuna o Las Trescientas* (1444) (cfr. Macrì 1969).
12. By the irony of chance, this too structured just like the "Montana" meat ad: in six strophes of six verses each.
13. Many companies have relied on copywriters to sell their services. Three examples: Rhodiatoce SpA, operating in the technofibre sector, advertised the *Scala d'Oro* brand through the aphorisms of a small praetorian, Gaius Gregorius (https://www.youtube.com/watch?v=rc-cwrS7cOE); Argoclima, a manufacturer of heating and air conditioning appliances, narrates the western mishaps of Bill and Bull (https://www.youtube.com/watch?v=Y53KiaQngSw); Eni SpA, active in the oil, natural gas and chemical sectors, takes on the character of Don Quixote to sponsor Super Corte Maggiore fuel (https://www.youtube.com/watch?v=D8g6d9OXY0M).
14. Broadcast, according to some, beginning from 1961 and can be seen online at: https://www.youtube.com/watch?v=1J2XROKq6X0 (Last accessed 31 Aug 2020)

was also present in the *Areosol Bpd15* insecticide ad and in that of *Vallesusa Shirts16*. In short, in 1960s Italy publicity in verse and rhyme was more the norm than the exception. However, what at first glance may seem to be a phenomenon limited to one historical epoch and to the marketing tactics then in use, is really not. A research I conducted on the YouTube created a repertoire of a hundred television ads formulated in verse and rhyme. This sample of instances, transmitted in Italian programming from 1957 until 2017, reveals a high frequency of reprise of the language forms of poetry covering almost three decades (fig.1):

1) 1960-1970;
2) 1980 -1990;
3) 2010-2017.

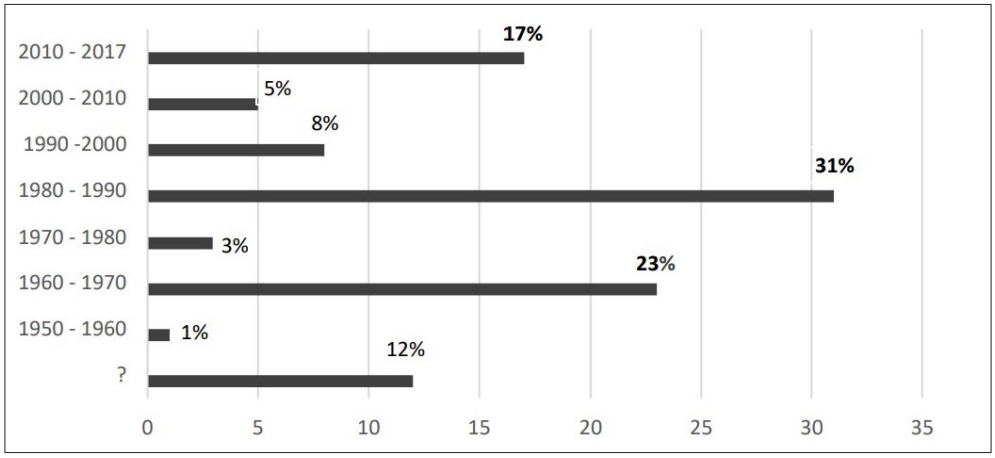

Fig.1 Analysis of the spot sharing on the repertoire investigated. The graph shows the concentration of television advertisements in rhymes from the 1960s to 2017

In the transition from one decade to another, both the length of the texts and the metrics-and-rhymes adopted vary for reasons surely linked to the changes in many factors that fall outside the scope of my analysis[17]. In summary, sales strategies, the creativity of copywriters, and the technology used by television broadcasters may change, yet the reprise of metrical-rhyming structures has remained constant over the decades, so much so that we may wonder if the metric-rhythmic forms are truly functional to

15. Its broadcast date is unknown, but it is estimated to have gone on the air in the 1960's, and it can be seen online at: https://www.youtube.com/watch?v=UTo3X0YyK5I (Last accessed 31 Aug 2020)
16. Broadcast, according to some, beginning from 1962 and can be seen online at: https://www.youtube.com/watch?time_continue=13&v=I0iENqfEVZs (Last accessed 31 Aug 2020)
17. The change in repriced metrical forms certainly goes hand in hand with the evolution of the musical and aesthetic-literary tastes that occurred in the reference period, but we should also consider the cultural level of the copywriters, the end of the RAI monopoly, the opening of new channels, market trends, etc...

commercial propaganda and what effects can be generated by structured advertisements in verses and rhymes. These questions has been investigated by several areas of literary criticism. The main ones will be discussed in the next paragraph.

State of the art

The relationship between poetry and marketing language has been examined by literary critics from all points of view: historical-literary (Medici 1986; Ghelli 2005; Palmisano 2011); stylistic and linguistic (Jakobson 1966; Baldini 1996); semantic and semiotic (Fabris 1992; Volli 2003); and sociological and economic (Capozzi 2014). These studies have shed light on the dynamics of advertising communication both by analyzing the aesthetic component of the messages and highlighting the poetic elements used by copywriters. Rhetorical figures in particular have been those most investigated, given their intensive exploitation in commercial campaigns (Foglio 2013; Lombardi 2017). However, almost nothing has been said regarding the resumption of metrical-rhyming structures in TV advertising, which seems to be exclusively linked to the creative flair and the cultural level of the advertiser. In a perspective diametrically opposite from the literary one, the psychology of marketing (Petty and Cacioppo 1986) has shifted attention away from the promotional message to its recipient. The consumer's character, behavior and attitudes in relation to the purchase have been studied in order to establish the most effective sales techniques and the most efficient tools. Verbal language is only one among the many 'tools of the trade' [18], and therefore the reprise of metrical-rhyming structures within the advertising communication is neglected. The aim of these researchers[19] is actually to define the mechanism of persuasion starting from the subject, and not to measure the persuasive capacities of poetic language. A step forward in this direction has been made by those humanistic disciplines (Stockwell 2002; Canettieri 2003; Tsur, 2008; Jacobs 2011; Calabrese, 2013) that consider cognitivism[20] as a source of knowledge and methodologies applicable to analyzing literary works. These are conceived not just as documents, but also as the result of the interaction between the human mind and the context in which one acts. Thus, the examination of a given literary phenomenon cannot disregard the study of the mentalities that have produced it. In these terms, the traditional investigation of poetics and styles adopted by authors over the centuries no longer stops at the level of literary attestations, but also involves the study of mental

18. Along with images, music and the human figure.

19. Whose most influential theories in the field of social psychology we recall (see Petty's and Cacioppo's *Elm* theory, 1986; Chen's, Duckword's and Chaiken's *HSM* 1987; and Kruglanski's and Thompson's *Unimodal model* 1999).

20. Also known as *cognitive science and cognitive psychology*, it is a branch of psychology, developed in the late 1950s in America, which studies the mental processes needed for forming knowledge (attention, memory, language skills, reasoning, judgment, decision...) (cfr. Benjanfield 1999).

functions activated in their production and reception. This type of research has shown that listening to a text divided into verses and rhymes can alter memory processes (Canettieri 2003; Pietro 2009), judgment (Schrott, Jacobs 2011) and appreciation in relation to the individual's cultural training (Cartocci et al., 2016). A further confirmation of the potential of poetic language comes from a study on the effects of rhyme in perceiving slogans (Filkuková, Klempe 2013). The experiment – implemented by means of an evaluation questionnaire – showed that rhyming advertisements are perceived not only as more amusing, original and easy to remember, but also as more reliable and persuasive than their non-rhyming counterparts. Although the last two research fields have produced important results in analyzing the potential of poetic language, they present some investigative limits. For instance, scholars of the humanistic-cognitive disciplines do not venture beyond the pale of literature; that is, they investigate the perception of the stylistic, poetic and aesthetic data by means of the literary works themselves. Hence their observation of the phenomena is limited to the perception of the tested materials. While Filkuková and Klempe investigate the "rhyme as-reason" effect, they neglect the fact that the fluency effect is also determined by the syllabic count of the sentence and therefore by the metrical structures in which the sentence is couched (Canettieri, 2003). Furthermore, the use of the questionnaire as a method of investigation has two disadvantages: it is not representative of a real context, and it reduces the phenomenon of persuasion to a judgment on a scale of values.

Presentation of my research

Targets

To overcome these limits, it is necessary to: a) go beyond the literary horizon, and therefore investigate the potentials of poetic language outside of the literary tradition; b) base our research on ecological grounds, to make the experience of the individual as similar as possible to the real one. For this reason, I decided to note the subject's perceptions to rhyming ads while watching a video. Advertising, unlike poetry, does not require the individual to implement a reading or listening strategy, and makes it possible to observe the potentials of the verse and rhyme free the traditional literary context. Furthermore, compared to a paper questionnaire, viewing a video is more suitable for determining the degree of message persuasiveness, since it simulates actual viewing conditions.
By basing my research in this way, it was possible to determine whether the metrical-rhyming structures were really functional to the advertising communication and how an ad is perceived in verse and rhymes, compared to a normal one.

Participants and procedures

A group of 40 participants (20 men, 20 women, aged from 19 to 45), all native Italian speakers of different cultural backgrounds, volunteered to join the project without receiving any payment. Each of them had the task of watching a video and answering the questions in a questionnaire. The experiment took place at the Biology and Industrial Biotechnology lab located in the Faculty of General Physiology at the "La Sapienza" University in Rome (building CU026). Each participant was seated comfortably before a laptop screen (Asus P302LA, screen size 13.3", 16: 9 HD 1366x768 resolution), at a distance of 50-70 cm. The audio component of the movie was listened to via earphone (Sony MDR-XB550AP headphones) At the end of the video, each subject was interviewed by the experimenter, who took care to transcribe the answers in a Word document, then re-elaborated in Excel calculation tables.

Experimental material and design

The experiment employed: a) audiovisual materials; b) a questionnaire on the viewing.

a) The video (lasting: 25' 13"), extracted from the BBC's *Planet Earth* documentary (the *Shallows Seas* episode, broadcast on November 26, 2006), was intentionally modified by the *BrainSigns* team[21] through the inclusion of two ad breaks (both lasting 5' 40"), as shown in fig.1. The advertising breaks were created by alternating two categories of the same ad (ad1 = advertisement structured in verse and rhyme; ad0 = advertising message structured without verse and rhyme). The ad texts of both categories are provided in the appendix.

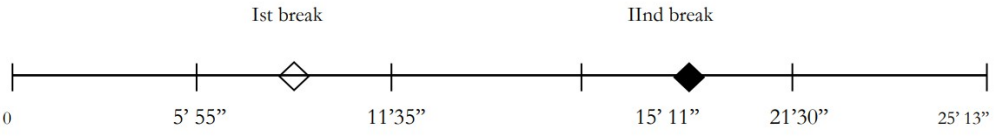

Fig. 1 *Composition of the film.* The ad intervals are indicated by small diamonds in the middle of two segments. The start and end of the ad breaks is indicated in minutes.

The order of the ads within the intervals has been inverted, as shown in fig.2, to avoid the predictability of their arrangement.

21. BrainSigns is a spin-off company of Rome's Sapienza University. The company develops innovation starting from scientific knowledge in recording and analyzing signals produced by brain functioning within varied research areas such as: Neuromarketing, Human Factors and Application clinics. The team is led by Prof. Fabio Babiloni, professor of Physiology at Rome's Sapienza University, and Arianna Trettel, Italian representative of the international NMSBA association, Neuromarketing Science and Business Application. For more details visit the online page at: https://www.brainsigns.com/it/

Fig. 2 *Composition of the intervals.* Rhyming ads are marked with the + sign, while the - sign is used to indicate unrhymed ads.

In order to more closely observe the perceptions of the rhymed ads, two models of the same video were created, in which the arrangement of the ad intervals was inverted, as shown in fig.3. Half of the participants viewed the first model, the other half the second.

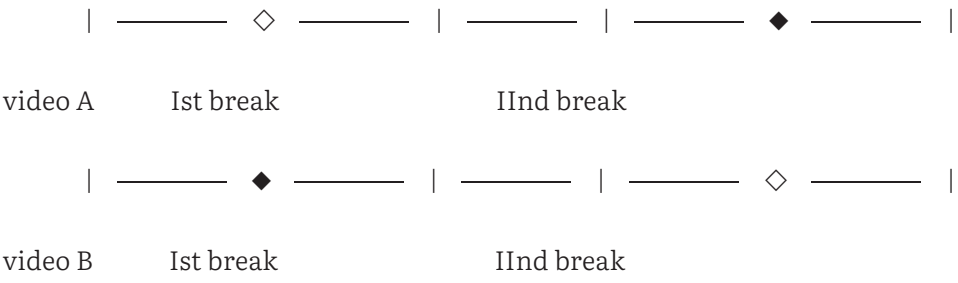

Fig. 3 Composition of the two models (A) (B).

b) After viewing the documentary, the subjects underwent an interview that required them to: 1) recall the ads in the medium-length feature; 2) recount their plots; 3) recall the brands of the products featured in the documentary; 4) recognize the ads present in the video (through frames) and give them a 1-10 approval rating.

To test the subjects' memories, questions 3 and 4 were modified with the insertion of products and frames not belonging to the ads in the video. Paired t-test are performed for testing the differences between both ads1 and ads2 for the spontaneous-solicited recall, and evaluation of liking. On next section only preliminary results or tendencies are reported.

Results

Spontaneous recall shows a statistically significant increase in correspondence of ads1 compared to ads2 ($t=8.192$; $p<0.001$) (figs. 4, 5). Almost the same results can be observed from solicited recall results ($t=4.69$; $p<0.001$) (figs. 6, 7). Moreover, the ads that used metrical-rhyming structures to communicate their message were recalled more accurately and pleasantly, in comparison to their non-rhyming counterparts ($t= 8,261$ $p<0,001$) (figs. 8, 9).

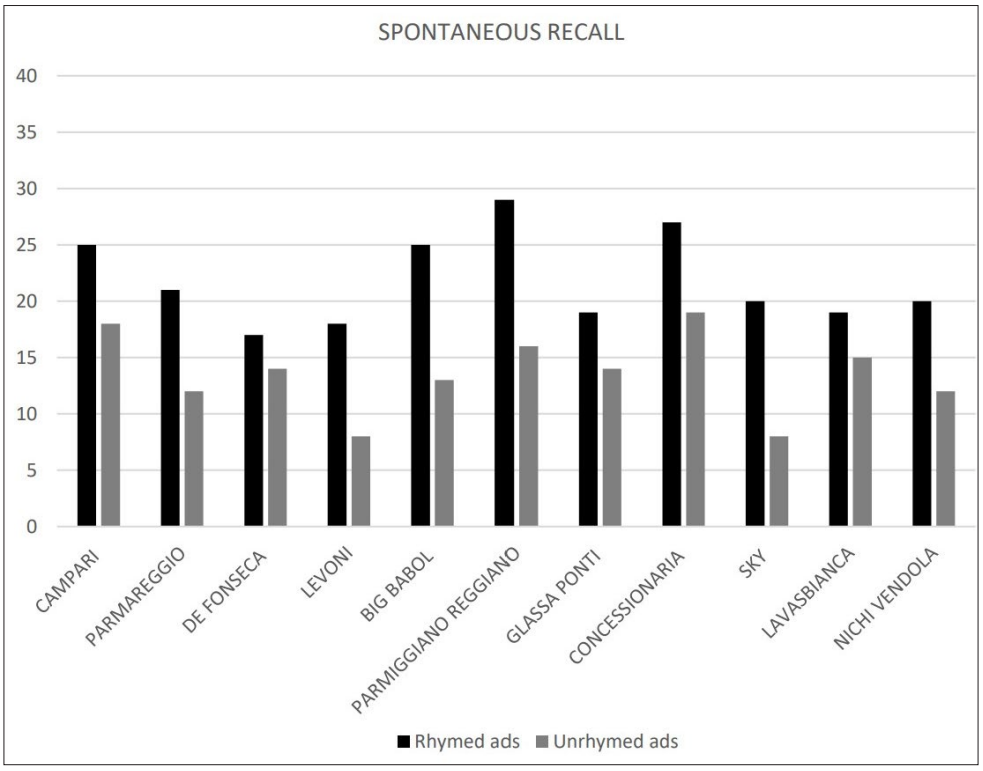

Fig. 4 The graph illustrates the frequency of spontaneous recall per ad. In a value scale of frequency of 40 times, ads1 were recalled by a minimum of 17 (*De Fonseca - black*), to a maximum of 29 (*Parmigiano Reggiano - black*), while for ads2 the frequency dropped from a minimum of 8 (*Levoni - grey*) to a maximum of 19 (*Concessionaria – grey*).

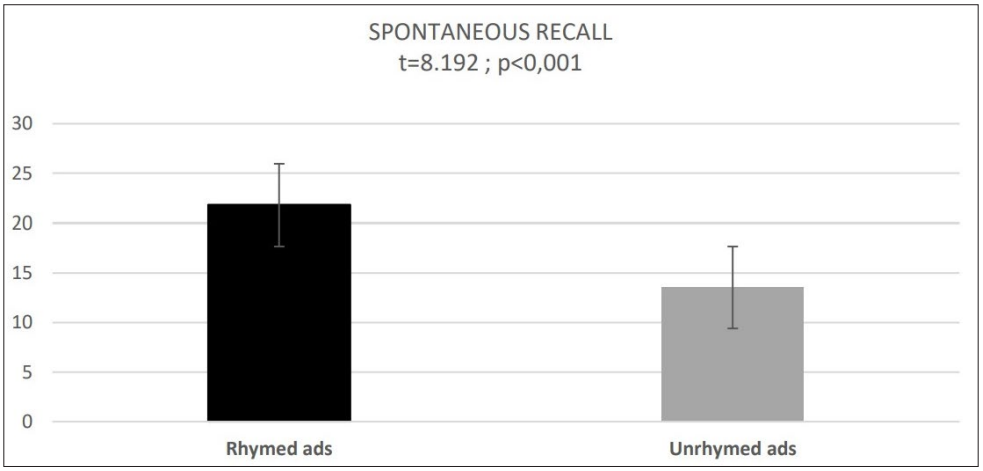

Fig. 5 The graph shows the average value of spontaneous recall between rhymed and unrhymed advertising. TV commercials belonging to the first category are remembered with an average of 21.82, compared to those fit in to the second category, which are remembered with an average of 13.54.

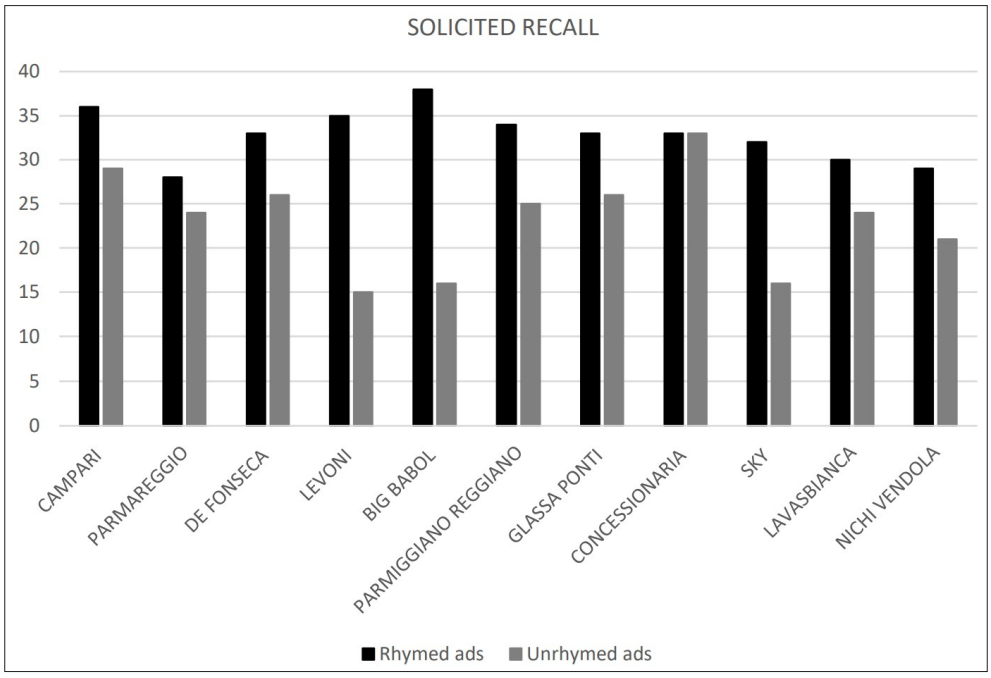

Fig. 6 The graph illustrates the frequency of solicited recall per ad. On a max. frequency of 40 times, ads1 were recalled by a minimum of 28 (*Parmareggio - black*), to a maximum of 38 (*Big Babol - black*), while for ads2 the frequency dropped from a minimum of 15 (*Levoni - grey*) to a maximum of 33 (*Concessionaria - grey*).

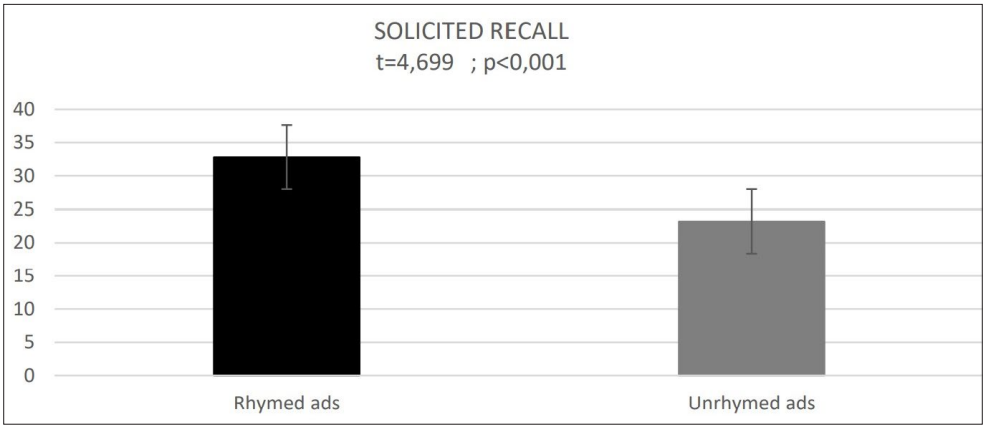

Fig. 7 The graph shows the average value of solicited recall between rhymed and unrhymed advertising. TV commercials belonging to the first category are remembered with an average of 32.81, compared to those fit in to the second category, which are remembered with an average of 23.18.

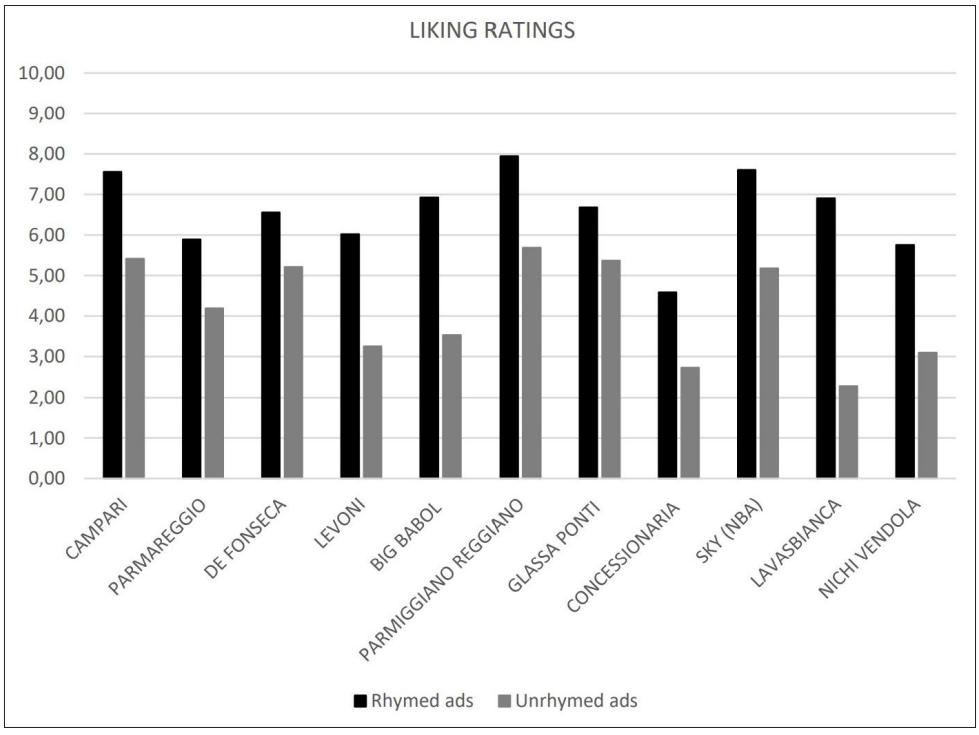

Fig. 8 The graph illustrates the average value of liking ratings per ad. In a value scale of 0 to 10, ads1 were liked by a minimum of 4,5 (*Concessionaria - black*), to a maximum of 7,9 (*Parmigiano Reggiano - black*), while for ads2 the rating dropped from a minimum of 2,2 (*Lavasbianca - grey*) to a maximum of 5,6 (*Parmiggiano Reggiano - grey*).

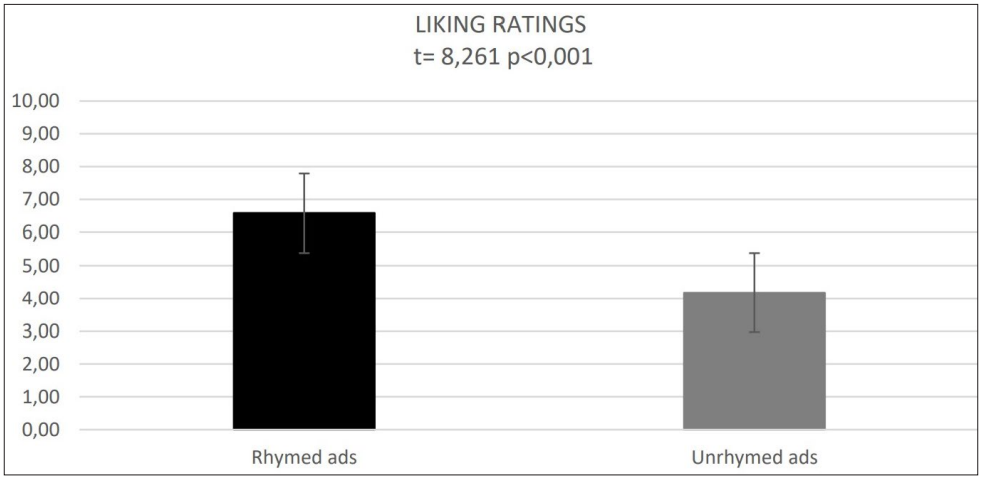

Fig. 9 The graph shows the average value of liking ratings between rhymed and unrhymed advertising. TV commercials belonging to the first category are the most appreciated with an average of 6.59, compared to those fit in to the second category, which have an average of 4.18.

General discussion

As has already been clarified in the state of the art, verse and rhyme recall within ads can be observed from different angles. From Jakobson's, for example, the metrical-rhyming structure are elements of emotional language that go beyond the limits of poetry, while remaining tied to the poetic function of verbal communication. Thus, "the mnemonic verses cited by Hopkins (such as "Thirty days have November"), modern ad rhymes, the versed medieval laws cited by Lotz, or, lastly the Sanskrit scientific treatises in verse [...] use the poetic function..." despite having very different communicative intentions from those of poetry (1966, 191). According to the scholar Maria Elena Palmisano, it is not a matter of "instrumentalization", but of intertextuality, that is, of reciprocal exchange relationships that are established between two or more texts – in this instance between the ad message and the poetic tradition – (2011, 28-29). The reprise of the verse and rhyme would then fall into the category of *hypertextual* relationship, since metrical units and systems are remnants of elusive advertisements that refer to the poetic tradition. It is evident that the reprise of poetic language takes place under as parody, satire and fun (ibid., p.31) and there is no doubt that these "interchanges" began as early as the nineteenth century (Ghelli 2005, 35-38) and have endured to the present day (Medici 1986, 131-140), but it is equally true that in advertising terms no textual interaction occurs unless it has a purpose. Just as in the political slogan "I like Ike", the recall of elements belonging to the poetic language must have a precise communicative purpose. Fabris (1992, 266-267) spoke of a "persuasive" finality of the poetic function in TV advertising, given the abundance of rhetorical figures adopted to convince the consumer of a product's quality (ivi 281-292). Fabris states that the three objectives of rhetoric (*delectare*, *docere* and *movere*) "coincide with fair approximation with the prerequisites of good advertising" (Ivi. 283-284) and, in such terms, our results show that the metrical-rhyming structures are effective in achieving the first and second aims. In other words, verse and rhyme are incisive in advertising communication, soliciting a recipient's recall and determining his or her liking. Hence recalling metrical structures is not purely ornamental, but functional to the manipulation of discourse, as much as is the employment of rhetorical figures (Lombardi 2016, 130-144; Sheet 2013, 180-187).

This is also confirmed by Maria Rosa Capozzi in regard to the links between the propaganda of the Fascist regime and advertising. As with Mussolini's oratory, the advertising slogans are built on phrases and rhetorical procedures that exploit the evocative power of sounds, syllables and words. Therefore, "[...] recourse to the rhythmic schemes of poetry (sound correspondences, sentence symmetry, etc.) assumes a precise pragmatic function, i.e. that of stimulating immediate memorization and adhesion to the contents in the recipient" (Capozzi 2016, 103). The same phenomena occur when the listener's attention is diverted from the content of the message to its form. In psychological terms, rhymed headlines have precisely this function: if the discourse "sounds good" or "runs smoothly", the recipient underestimates the products' features and focuses on how they

are promoted (see Petty, Cacioppo, 1986). So, in short, the form in which the product/service is presented becomes more important than the content of the message itself. Obviously, as far as TV advertising is concerned, other factors contribute to "distracting" the individual: colors, images, figures and characters, etc. However, as can be seen from the research results, ads in verse and rhyme have aroused more interest than the corresponding ads without verse and rhyme, but with the same content (same symbols, characters and images). This allows us to reinforce the hypotheses derived from other experimental studies (Canettieri 2003; Di Pietro 2009; Cartocci et al. 2016) regarding the effects of metric structures on the recall and appreciation of poetic texts.

On the one hand, the link between verse, rhyme and recall can be explained by the effects that prosody raises on mnemonic receptors. Syllabic scan "actually activates specific receptors that we use to fix words in our mind" (Schrott, Jacobs 2011, 353). On the other hand, pleasure is determined by the musicality of the phonemes involved in rhyme (Tsur 2008, 236-243). Continuous and periodic sounds tend to have a positive emotional perception, while abrupt or aperiodic sounds are perceived as unpleasant. The influence of metrical-rhyming structures on memory, pleasure and judgment is confirmed by Filkuková's and Klempe's study (2013). Their research shows that the rhyme-as-reason effect occurs not only in evaluating aphorisms, but also applies to the perception and evaluation of artificially recreated advertising slogans. The same phenomenon recurs in the present study. Unlike Filkuková and Klempe, we have investigated the perception of metrical-rhyming structures taken from TV ads, simulating the conditions of daily use. For this reason, we have included in our video already transmitted (but unfamiliar) ads, without asking the subjects for a more in-depth evaluation of the "persuasiveness" of the text. The previous opinion of the subjects, regarding the product brand, the sponsored product, the presence of captivating images, etc., is canceled by exposure to stimuli that change due to the presence of a single factor: the reprise of metrical-rhyming structures.

Conclusion

Therefore, the preliminary results of the present study respond positively to the questions proposed in my research aims. Verse and rhyme, as typical elements of poetic language, are functional to advertising communication for two reasons: they aid in consumer recall and stimulate consumer pleasure. In the hope of continuing with the experimentation to broaden the sample of interviewees, two questions remain open: a) What happens in the mind of the consumer when he or she listens to an ad in verse and rhyme, and how does his/her orientation change in their choice of products? b) Is the reprise of the elements of poetic language the result of the creativity of the author – and therefore can it be defined as *unconscious* – or is it deliberately desired – and therefore can it be defined as *plagiarism*?

Acknowledgments

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Appendix

Advertising 1
https://www.youtube.com/watch?v=wNdj3D9ZPxk **Rhymed version**
https://www.youtube.com/watch?v=3KkjUq5PDYs **Unrhymed version**

Advertising 2
https://www.youtube.com/watch?v=zl7tZBPeqO4 **Rhymed version**
https://www.youtube.com/watch?v=RM0qmVR3KXo **Unrhymed version**

Advertising 3
https://www.youtube.com/watch?v=V5kAJsLkl4k **Rhymed version**
https://www.youtube.com/watch?v=zOUsjJMzYEc **Unrhymed version**

Advertising 4
https://www.youtube.com/watch?v=dObUIwfx9C0 **Rhymed version**
https://www.youtube.com/watch?v=SM_DBAmriiA **Unrhymed version**

Advertising 5
https://www.youtube.com/watch?v=TZ5OpscJvBM **Rhymed version**
https://www.youtube.com/watch?v=hAVzbvGaAh4 **Unrhymed version**

Advertising 6
https://www.youtube.com/watch?v=cPIeITte32M **Rhymed version**
https://www.youtube.com/watch?v=QatgK5BBGDM **Unrhymed version**

Advertising 7
https://www.youtube.com/watch?v=CyE5HMubvrk **Rhymed version**
https://www.youtube.com/watch?v=Yo9oHwC2TDY **Unrhymed version**

Advertising 8
https://www.youtube.com/watch?v=VSpMhMv3DPg **Rhymed version**
https://www.youtube.com/watch?v=U2Y9YngxfwI **Unrhymed version**

Advertising 9

https://www.youtube.com/watch?v=v4I8ONjNVhw **Rhymed version**
https://www.youtube.com/watch?v=JjnRcaNzWfo **Unrhymed version**

Advertising 10

https://www.youtube.com/watch?v=fsak0zPGgXs **Rhymed version**
https://www.youtube.com/watch?v=xKyJS5fAFLs **Unrhymed version**

Advertising 11

https://www.youtube.com/watch?v=9JV1naZ5Ilg **Rhymed version**
https://www.youtube.com/watch?v=nIznLReNGjo **Unrhymed version**

Advertising 12

https://www.youtube.com/watch?v=TJAoULKlIdg **Rhymed version**
https://www.youtube.com/watch?v=dYOFO2HbJ2U **Unrhymed version**

References

Baldini, Massimo.1996. *Il linguaggio della pubblicità: le fantaparole*. Roma: Armando Editore.

Beltrami, Pietro G. 2011. *La metrica italiana*, v° ed. Bologna: Società editrice il Mulino.

Benjanfield, John G. 1999. *Psicologia dei processi cognitivi.* Bologna: Società Editrice il Mulino.

Brainsigns. Accessed March 15, 2019. https://www.brainsigns.com/it/

Calabrese, Stefano. 2013. *Retorica e Neuroscienze*. Roma: Carocci editori.

Canettieri, Paolo. 2003. "Metrica e Memoria. La funzione adattiva della metrica intesa come supporto memoriale." *Rivista di Filologia Cognitiva* n°I.

Capozzi, Maria R. 2014. "I linguaggi della persuasione: propaganda e pubblicità." *Gentes: journal of humanities and social sciences* n°1(99):106.

Cartocci, Giulia et al. 2016. "The "NeuroDante Project": Neurometric Measurements of Participant's Reaction to Literary Auditory Stimuli from Dante's "Divina Commedia"." In *Symbiotic Interaction: 5th International Workshop, Symbiotic* edited by Luciano Gamberini et al. Padua: Springer.

Chaiken, Shelly. 1987. "The Heuristic model of persuasion." In *Ontario symposium on personality and social psychology* edited by Zanna M.P et al., Social influence: The Ontario symposium, Vol. V, 3:39. Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

Codeluppi, Vanni. 2013. *Storia della pubblicità italiana*. Roma: Carocci Editore.

Di Pietro, Silvio. 2009. "Is the Lesson Put in Rhyme Memorised in Short Time?" *Cognitive Philology* n°II.

Fabris, Giampaolo. 1992. *La pubblicità, teorie e prassi*. Milano: FrancoAngeli editore.

Filkuková, Petra & Klempe, Sven. 2013. "Rhyme as reason in commercial and social advertising." *Scandinavian Journal of Psychology* Vol. 54, 423:431.

Foglio, Autore. 2013. *Il marketing comunicativo dell'impresa. Dalla pubblicità alla comunicazione offline e online al consumatore*. Milano: FrancoAngeli editore.

Ghelli, Francesco. 2005. *Letteratura e pubblicità*. Roma: Carocci.

Jakobson, Roman. 1966. *Saggi di linguistica generale*. Milano: Feltrinelli Editore.

Kruglanski, Arie W. & Thompson, Erik P. 1999. "Persuasion by a Single Route: A View from the Unimodel." *Psychological Inquiry* Vol. x, n°2, 83:109. Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

Lombardi, Marco. 2017. Creatività in pubblicità: dalla logica alle emozioni. Milano: FrancoAngeli editore.

Macrì, Oreste. 1969. *Ensayo de métrica sintagmática: (Ejemplos del «Libro de buen amor» y del «Laberinto» de Juan de Mena)*.

Medici, Mario. 1986. *La parola pubblicitaria: due secoli di storia fra slogan, ritmi e wellerismi*. Venezia: Marsilio Editori.

Palmisano, Elena M. 2011. *Letteratura e pubblicità. Interscambi ed esempi*. Lecce: Pensa Multimedia.

Petty, Richard E & Cacioppo, John. 1986. *Communication and persuasion*. New York: Springer-Verlag.

Petty, Richard E. & Cacioppo, John. 1986a. "The Elaboration Likelihood Model of Persuasion." *Advances in Experimental Social Psychology* Vol. Xix, 123-205.

Santini, Giovanna. 2007. "Contrafacta e canzone popolare." *Rivista di Filologia Cognitiva* n°IV.

Schrott, Raoul & Jacobs, Arthur. 2011. *Gehirn und Gedicht. Wie wir unsere Wirklichkeiten konstruieren*. München: Carl Hanser Verlag.

Stockwell, Peter. 2002. *Cognitive Poetics, an introduction*. London: Routledge.

Tsur, Reuven. 2008. *Toward a Theory of Cognitive Poetics*. United Kingdom: Sussex Academic Press.

YouTube. Accessed March 15, 2019. https://www.youtube.com/watch?v=Y53KiaQngSw

YouTube. Accessed March 15, 2019. https://www.youtube.com/watch?v=D8g6d9OXY0M

YouTube. Accessed March 15, 2019. https://www.youtube.com/watch?v=1J2XROKq6X0

YouTube. Accessed March 15, 2019. https://www.youtube.com/watch?v=UTo3X0YyK5I

YouTube. Accessed March 15, 2019. https://www.youtube.com/watch?time_continue=13&v=I0iENqfEVZs

YouTube. Accessed March 15, 2019. https://www.youtube.com/watch?v=rc-cwrS7cOE

Volli, Ugo. 2003. *Semiotica della pubblicità*. Bari: Editori Laterza

THE FOURTH STATE OF MATERIAL BY LEONARD GASPAR. A POETRY TO STICH UP?

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Lorand Gaspar, surgeon, poet, photographer and researcher in neurosciences, offers a poetry nourished by his various know-hows and knowledges. His words pursue the aim of offering a place for somebody's real-life experiences that medicine cannot totally welcome or accompaign.

This study analyses how the poetic act of Lorand Gaspar metamorphoses the violence of a surgery intervention in an essential gift of life, by questioning the sense and the evolution of the poetry in the first anthology of Gaspar, *The Fourth state of material*. To answer this question, we consider, firstly, the sense of the title of the anthology. Then, we proceed to a diachronic study of the two versions published, the first one in 1966, the second one in 1982, to understand how repairing bodies and writing are for Gaspar a similar intent to say the common essence of the universe, vibratory energy which constitutes nature, which includes human beings.

I. Birth and sense of The Fourth state of material

Lorand Gaspar created to himself, from his birth, the circumstances of a life that feels the world's multiplicity, and gathers several worlds in one human being. This citizen of crossroads was born in 1925 in oriental Transylvania in Targû Mures, a city that used to form part of Hungary, but annexed to Romania in 1920. So Hungarian is the mother tongue of Gaspar, but he was born as a Romanian citizen. He speaks Romanian currently, as well as German and French. He chooses French for poetry, because he wants to give coherence to his life's experience in France, and to reflect his real-life experience (Gaspar, Margantin). His professional career is as ramified as the confluent of cultures of his childhood. Admitted to the polytechnic school of Bucarest, he is mobilized in 1943, and deported in a work camp, from which he escapes in 1945. He takes refuge in France, where he pursues medical studies. Having become a surgeon of the French hospitals, he exercises during sixteen years in Jerusalem and Bethlehem and, from 1970, at Charles-Nicolle hospital in Tunis.

It is from these experiences, rich, testing, that unceasingly surprise and question the human being behind the surgeon about his journey among the humans and the earth, that *The Fourth State of material*(Gaspar 1966) is published in 1966 at Flammarion editions. This poetic anthology is marked, in this first publication, by an open lyrism, inscribed in the experienced reality – the one of the aridity of the desert, mixed with the suffering of the patients – suffering that the man feels inside the doctor – and by a passion for the deserts, that offered to him "miraculous" (Gaspar 2001, 20) hours of writing in the early fresh mornings.

About the meaning in which to understand this fourth state of material chosen as the title of the anthology, Lorand Gaspar says nothing. In each word he writes, "framework of ardour and circulation" (Gaspar 1978, 84), he lets to each one a free interpretation: "each one can read in something else and also the same thing." (Gaspar 1978, 84). This freedom in the understanding, specific to the poetic language, repeated here by the poet, is from high interest for the poetical analysis, because the nominal group of the title refers as well to the plasma in physics, a component of high unstable level of energy, very conductor and representing ninety-nine percentage of the visible material of the universe, concentrated in the elements of high luminous density like the stars, as to the plasma in medicine, bloody liquid which supports lots of globules and molecules. So the title is suggestive, connecting physical and medical sciences to poetry.

In this meaning, poetry could be considered as the fourth state of verbal matter, that would be an alchemisized language, combining articulated speech, orderly written words and medical concrete *praxis* in the poetical vow:

> That in a very sweet syllable
> I shall dilute all violence and all gold
> This pure wheat of myself kept secret. (Gaspar 1978, 84)

Poetry is a text on the fringe of ordinary states of language, but inscribed in their continuity by using the same usual words, organized in a manner that makes the common meaning of the words invisible, and disturbs the senses. These elements make suppose a great presence of figures or expressions referring to light and to her opposite, obscurity, and to the blood and his external opposite, the coagulated matter of the stone. The poetic text fulfills the promise of the title, as the second and last publication, in 1982, opens with the section titled "Knowledge of the light" (Gaspar 1978, 35-49), to end with the fourth section titled "Garden of stones" (Gaspar 1978, 77-86) Moreover, the lexical field of the light and its variations until the obscurity, the one of the blood, appears concretely in the original version, but just by qualified images in the second one. The lexical field of the stone, particularly in the desert, marks also the arcanums of the poems. We are to analyze these manifestations from the poems in the last version of the anthology, where the preliminary poem lets in echo some verses that play with the range of the light. Here is the brief poem considered:

The fire took our rivers!
A bird sometimes preened the light –
Here it is late.
We will go from the other side of the things
Exploring the bright face of the night – (Gaspar 1978, 35)

The second verse continues in the two last verses of this quintile, and reveals the original look of the poet in the final oxymoron, that associates "bright" and "night". This oxymoron is doubled by the oxymoron we can read vertically between the substantives "light" and "night" in final position in the second and in the fifth verses. The two terms are in suspense, in mystery, by the dash. Unceasingly in the speech, "the light plays" (Gaspar 1978, 38) in the "narrow bodies", and lightens the "fast abyss under the skin" (Gaspar 1978, 39). This is also "the mouth swelled of nights" (Gaspar 1978, 45) that the poet would like "to insufflate the freshness / capillary by capillary" (Gaspar 1978, 51) by "These metals" he "curves in [his] voice" and which "still open / all a lung in the stones." (Gaspar 1978, 55). Open and close in the surgery act correspond in the language to the association of opposite meanings in the language, that poetically are the two sides of a same movement, necessary for life: contraction and dilatation, for respiration.

In *The Fourth State of material*, the respiration, in the common sense, and in the particular meaning of the text, that is balance between visible signs and pauses going to silence, is always pursued. It is at the same time vertical and horizontal, in movement in the surface and in the deep, creating space. Amplitude is won only by contrasting verticality and horizontality. We can see this interrelation between the two directions in the following poem:

white walls of rested birds
fossils to chance in the layers of the day
waters painted of our passages
the deeps are still shivering –

swaying of wings
fast abysses under the skin
we lean over smoking beaches
cheeks burnt (Gaspar 1978, 39)

These two quatrains ''connect an exteriority and an interiority which vibratory seizure could be evocated by the skin, point of contact of the man and the world" (Lefort 2015, 132). The lexemes ''walls'', ''layers'', ''deeps'' refer to verticality, which contrast with ''rested'', ''skin'', ''beaches'', which seme orientates toward horizontality. The entire scene happens under the absence of light, nevertheless present in the evocation of the ''white walls''.

We also meet again the bird, which is an essential figure in Gaspar's work. Its presence annunciates a renewal of the vision or the perception. ''By the mobility of its trajectory, he concretizes this circulation to the infinite which is liberation in the heart of things [...]'' (Debreuille 2007, 74). And it is there, ''In the deep of the bag of the night'' that there is thus ''all a world of minuscule reserves of clarity" (Gaspar 1997, 74).

The poetry of Gaspar plays with mise en abyme, so that in the far end of the night, we touch silence, that is, laid down the poetry, resonance of the gesture, of the world. Gaspar enjoins to go in the silence to perceive the world: ''Be the listening and in the same time the movement, unfinishing and indissociable" (Gaspar 2004, 140). The poet still orders to forget, to be silence, to oneself reach the heart of the informulable:

> Now forget that again. Be silence and silence of the speech, action and immobility, rain and sun, the movement that invents you according to the rhythm and the seasons of all the materials that do and undo you (Gaspar 2004, 140).

The poem of Lorand Gaspar is a resonance between silence and movement, in the wake of Ufan Lee's vision: by a ''meeting art'', the aim is to ''limit the acted parts and accept the non acted parts, creating in the same time between them dynamic relations of interpenetration and repulsion" (Lee 2002, 19). From ''the creatures of claws and teeth'' that ''fight in silence'' (Lee 2002, 75) in the depth of the flesh, allegory of violent interns movement in the body face to the surgery intervention that moves the confrontation ''between skin and light''(Lee 2002, 75), we goes along, by a gesture that knows the light over the painful confrontation in the invisible silence of the body, to reach a spaced out place. Image of nature, moving and passing, ''Our lives ripened at the hotest point of our members''(Lee 2002, 72) the fragile life between the surgeon's hands comes to the point ''where the day quivers and decomposes itself'' (Lee 2002, 72) under the light of the day found again.

In Gaspar's work, numerous occurrences put in stage a light brightening the surface of the elements, that ''looks itself on our hands''(Lee 2002, 67), but others let discover an internal light, that brightens the deeps, areas of darkness. Gaspar's poetry moves forward in these unknown spaces with delicacy, with '' [...] the shedding of leaves on the skin''(Lee 2002, 68): the hypallage puts the accent on the gesture of the hands, the entire verse, elliptic poetical metaphor of a surgery act, contrasts with the following verses, that evocate the spurt out of light in the first noun, ''patches''(Lee 2002, 68), and diffuses itself in the personified space: we perceive ''sudden patches in the forms / when space hears us''(Lee 2002, 68). The condensed link between space and hearing amplifies the opening, the impression of quick diffusion of light gradually with the going down inside the different layers of the skin.

In other places, transposing a medical term to the light, the poet says the violence with which appears this last, at the same time brightening what was deeply hidden. "What my unceasingly interrupted speech looks for [...] is not the pertinence of a

demonstration, of a law, but the striping of an uncatching, transfixing glint [...]''(Lee 2002, 17) The glint of which it is question has a rare quality, that medicine technically attributes to a pain brought to her highest degree of intensity. This light is ''transfixing'': it springs from the deepest part of the body with a harrowing violence, but it lightens. This phenomenon is a ''strip of the light''(Lee 2002, 18), that is one of the foundations of beauty. This last cannot spring, according to Gaspar, without the support of "a growth of the intensity of life.''(Lee 2002, 18)

The poet-doctor does not aim to lighten elements by outside light, but he would like that the light contained and hidden in the dark recesses reveals in the material: ''You would like that by loving them enough to give them your voice, light shows itself in the things more than pointing them.''(Lee 2002, 182) The birth of this non common action needs the venue of an actor at the origin of the process, capacity of love, the motor that permits the alchemy between light and material. The poet has to love things enough so that in these ones, by the intermediary of his own voice evocating them, light blossoms. It is to go over the insufficient eviction of the negative to know, positively, ''how to love'' (Lee 2002, 17), so that the light would get all the space. At the term of a quest of which the time is indefinite, because the poet knows and affirm to each all: ''you will never arrive in the depth of this night''(Lee 2002, 74), open plenarily one's heart in the silence is the unique access road to a truth that reveals in the place of the ineffable. It is by the ellipse that the poem expresses this unformulable truth:

> conceal the name with enough joy
> for that the ligns of force
> show in the whites. (Lee 2002, 39)

In Gaspar's, beauty, real, are intricated with truth: the final mix, in the poem, would be another face of the fourth state of the material. The subject, the world, is considered in ''the growth of his total being where body and mind, knowledge and innate are sticked together in a same climb to the day''(Lee 2002, 15). In the silence bodies recover, splendid:

> and the muscles, the bones, the arteries,
> rise, shake in the beauty –(Gaspar 2010, 10)

By the transmutation of the medical thinking and lexis in the poem, Gaspar roots the scientific speech in the poetical speech, by a building of which the genesis, rigorous and attentive to the human that it aims for understanding, follows a similar evolution.

II. Genetical study of a surgical poetry

From the first version of the anthology, honoured by the Guillaume-Apollinaire prize in 1967, Gaspar offers a very distinct version in 1982. He considers that there are two books, recountinf the same experience translated in the language of the poetry, that time contributed to enrich:

> *The Fourth State of material* was so much revised that it is in fact a new version. In my mind, this new version does not replace the first one, she constitutes, fifteen years after, a different development, in the language, of the same experience. (Gaspar 2010, 21).

During this measured time, the experience of a very time-consuming work and different cultures has inscribed itself in the body, which "does not forget anything" (Gaspar 2004,122). This last one prompts the doctor-poet to plot in "a different development, at the level of the language, [...] the same experience." (Gaspar 2004, 21). A brief analysis of the most essential modifications will indicate what changed, or what is completely different from a version to another, and will show how the work at the level of the poetic language is revealing of a change in the relationship between the man and himself and with the world. From a writing that, in the first version, looks forward to elucidate itself and to tell itself by concrete images, mixed with the reality of one another, Gaspar's writing reaches a speech that transmits a deeper experience, refined, where the self-disappeared in aid of a poetics of the sensitivity, sensitivity of the sense and the soul to the weave of the material that units beings and things. Each pole of writing modification can be put in parallel with the progress of the surgery work, because Gaspar always felt, thought and acted in a plenary manner, surgery and writing following a same way, the scalpel nourishing the pen, and conversely.

Montaigne is a reference regarding Gaspar, to illustrate the idea of interdependence between the man and his book. Both consider that for the real life and the writing being possible, it is necessary to have breathing spaces, a rhythm and an alternating between activities, in order to reveal the similarity of each gesture that builds each activity, in the light of the experience. Gaspar formulates the alternative and necessary articulation of the surgery and the writing activity:

> I have the feeling that each one of these activities – the act of writing, of manipulating the language, and the act of treating, of stitching up (I note that in both there is a dissection time and a building time) – flows from the same desire of living and seeing clearer. Each of this "doing", in myself, needs the other one, each one expresses and affirms as well as it can the particular rhythm of a piece of life or existence, unfolding its music of clearnesses and nights, of pains and joys, of energy and ''emptiness''(Gaspar 2004, 186).

The speech of Lorand Gaspar looks for catching the matter-world in this unitarian globality. His poetry, combining cartesian and spiritual vision, has the particularity to testify "to dynamic weaving" (Laffont-Bissay 2015, 8) which links the being to the world. For him, there is the circulation of a same energy within the sensitive reality. He adopts a materialist vision, which does apply its foundations onto the monist working of body-mind, and onto the whole of the physical forces that move the living material of the universe. This unicist vision of the living applies itself onto the human life, whose all the activities, even if they seem contrasted from the outside, are not unless close one to another, because they pursue the same aim for Gaspar, which is to move closer to the living, to know it by a highly repeated experience. To him,

> To go from the treatment of the patients to the leaves of my note-books or to pieces of paper, the distance is less important as it seems to be. It is always our limited life, its sources, its links, its pains and its joys which are questioned. [...] The outpourings that surprise sometimes are raw material, and need a long work of asking, of adjustment, of clarification. In all these approaches that we have to take again unceasingly, there is a beginning of opening that invites us to unceasingly persevere (Laffont-Bissay 2015, 187).

In general, a cutting activity, or even a cancelling one, has been realized between the two versions of some poems, which has had for joyful result to lighten the text, to give it more momentum, and to obtain more hard-hitting images, increasing also their mystery. Moreover, lots of texts of 1966 were taken again with sensitive changes concerning personal pronouns. This work on the poetic language forms part, to do a parallel with what Gaspar lives daily, to a surgery operation on the text. As certain parts of the body are disinfected, amputated, the fleshes incised then stitched up by the surgeon animated with the "desire to repair" (Laffont-Bissay 2015, 139), the writer looks forward to clarify his thoughts. It is a common feeling, according to Alain Schaffner, "that presides to the surgical operation, the hand that leads at the same time the surgeon's scalpel and the poet's pen." (Schaffner 2017, 278).

Here are the two versions of a brief poem of the first section, "Knowledge of the light".

Version of 1966

As the looks that are surprised
to be dead
As scrap themselves
the drunk birds their feathers
Our gestures where too much clear
to not create
their heavy of shape. (Schaffner 2017, 15).

Version of 1982

As the looks surprised
to be dead
as scrap themselves
the drunk birds their feathers
our gestures where too much clear
to not catch
their heavy of shape. (Schaffner 2017, 43)

From the first version to the second one, the increase in concision is noticeable, by the transformation of the relative proposition of the first verse in a nominal group, which is why the revelation of a poetic of the sensoriality, possible by the real-life working. There is also more nuance, literally, in the verb. The error of the gesture and its consequences in the worked flesh is accepted, and the verb "create", which in the first version carried its weight of guilty, is transformed, in the second version, in the discover of an intern world by the precision of a gesture that asks and lets itself "catch" what it wants to repair, better than damaging the deeps he is working on.

Several times, from a version to another, Gaspar cuts the poem, by the stump of the "I". One of the most representative text regarding this lightning, at the same time on the length, on the pronouns, with the disappearance of the anaphor of the "I", which appears only one time in 1982, on morphosyntaxis and on the images, is the premiliminary poem of the second section, "Iconostasis".

Version of 1966

Light from far.

I would like to insufflate you the freshness
capillary by capillary

I would like you to feel the sliding of
the air and the narrowing of the papilla,

I would like to make you green words at the morning
of the words

That you might wanted to touch, to crush
until having the fingers weared out

(It is still the same garden, the same
sun and the same morning)

Lay down on them, or take them in the mouth,
as the same

acrid and acid taste discovers the tongue

I would like to write you with my nails in
the lazy age of the stone and maybe
in the eyes

Convince you of the earth.(Schaffner 2017, 30).

Version of 1982

I would like to insufflate you the freshness
capillary by capillary
that give birth to you the sliding of the air
and the narrowing
of the papilla doing you green words
at the morning of the words
that you would like to touch to crush
write to you with the nails in the lazy age
of the stones
in the eyes –
convince you of the earth. (Schaffner 2017, 51)

The modality of the sentence changes too in the way of a *moderato cantabile*, of a poetic of the voice more discrete, which mixes itself with what it perceives with the persevering research in the deep of the material, where it finds the subtility of the organic sound, the attenuated language of the fleshes, that speaks better in the murmur than in the exaltation. While in 1966, the poet exclaimed himself: "These metals I curve in my voice for / you to exist in the dark!" (Schaffner 2017, 38). In 1982, the insurance he won in his movements and their consequences permit him to affirm what is, and to suppress the extern against-rejection: "These metals I curve in my voice / for you to exist in the dark." (Schaffner 2017, 55).

Concerning the topic of the relations between men and women, in the version of 1966, the lexical field of love is explicitly present in the terms. At the opposite, in the version of 1982, this relation is much more attenuated, nearly evacuated, by the absence of concrete expressions that appeared before, like these ones:

When the men heavy of sun come back to the harbor
filled of wind and spume
women's bodies and eyes
make a village of windows,
dark and blue [...] (Schaffner 2017, 17).

These modifications are made to the benefit of nuanced images or metaphors, the feelings living discretely in "windows where are dreaming / islands hidden in the eyes" (Schaffner 2017, 46), which that contributes to universalize the relations. The interpretation becomes thus much larger, suggesting a love extended from the human being for

the living in its globality. More radically, in the version of 1966, the substantive "Love", associated to the "Fear" in the nominal group "Love and fear" (Schaffner 2017, 20), which is the fear of the missing and the death, visible in the following rhetorical question:

> And how will I read
> In this crazy jangling
> When you will invent dying? (Schaffner 2017, 20)

is evacuated in the version of 1982, where the poem was suppressed. The two feelings are not associated anymore, and the substantive "love" appears only one time in 1982, under an interrogative partial form, where the interrogative point is missing: "but how to say the love" (Schaffner 2017, 65). The answer stays open, diffusing itself in the images, like in this one: "where one gesture or two have loved the light –" (Schaffner 2017, 64), which develop an intimate scene by pieces of images:

> bodies rise up in the invisible clarity
> nude hips and syllables of water
> long and brief mouth that lean
> sound of glass grounded on the depths –(Schaffner 2017, 64)

The images solicit more the union of the being with nature, with the life power of the elements that he lives with. Thus, this union, powerful, evacuates the fear, that has no more reason to appear in the text.

The multiple corrections and adjustments operated in the original text have for aim to reveal the elements and the feelings without naming them, in order that they show themselves in their own nature, which do not need any justification. The aim of the poet is

> to conceal the names with enough joy
> for the lines of strength
> show themselves in the whites.(Schaffner 2017, 78)

From this instant, the poet formulates the wish "That in a very sweet syllable" he "could dilate all violence and all gold" (Schaffner 2017, 81), to reach "This fulfillment nearly"(Schaffner 2017, 81). Effectively, the poet is still moved by the desire of knowledge. He maintains in himself "an inexhaustible hunger to born"(Schaffner 2017, 81), because in the medical act as in the poetic act, the *poïein* is realized with the humility of "Hands which know, hands which dance for that the material become human" (Gaspar 1997, 30), without ambition of a total knowledge or action. He says about that conception:

When we arrive to access to a vision, to a manner of thinking and living as open as possible, we learn to renounce to the useless checking of our little and big brainwaves which dissolve themselves in the infinite opening. To check, yes, as well as we can our

daily movements that we know not only fallible but sometimes noxious, destructive for the others or for ourselves. Knowing to be glad for one's capacity to understand the things of the life and of the world, even partially, even relatively.(Gaspar 1997, 30)

To end this diachronic study of this first gasparian anthology, we are to consider the measure of the time, which becomes more extended in the second publication, showing that time spent on the man, affecting his living and his relation to nature, particularly to stones. Originally, the poet said:

> From several days
> We only are sensitive to stones. (Gaspar 1997, 71)

Sixteen years after, days were transformed into years, the living is transferred in the temporal terms:

> From several years we only have trade
> With the stones. (Gaspar 1997, 70)

The change of the relation with time is closely linked to the relation between the man and the material. With the weight of the experience, the poet's consciousness were like fixed in the solid material of the stone, on which time works without one being able to define were it stops. This is perceptible in the choice of the titles of the sections. A comparison between the tables of the two versions lightens our thought.

Table of 1966

1. Knowledge of the light
2. Iconostasis
3. Precisions of the absence
4. The fourth state of material

Table of 1982

1. Knowledge of the light
2. Iconostasis
3. Scales
4. The garden of stones

In the original third section, the antonymic terms looked forward to embrace the emptiness. At the contrary, in the second version, the title indicates more concrete elements, pointing the relief and the presence in the material. What is the most significant of what is, finally, the fourth state of material for Gaspar is the modification of the fourth and last title. This fourth state would be the state of the stone that is the living

coagulated in the material, not dead, but conserving into the solidity of the stone its weight of mystery.

In the original and beautiful 2003 *Sacré* from Gaspar, we can see a stone with four parts could illustrate this special vision of the material, visible but letting place to indefinite space and non-perceptible material inside. [1]

In conclusion, *The Fourth State of Material* by Lorand Gaspar is an emblematic and programmatic anthology of the evolution of the surgeon-poet's conception and of the evolution of his action, as far in the human body as in the verb. By cleaning the wounds and stitching up the fleshes, by remodeling and purifying the verses, the ultimate goal is to reach "the miracle of attention, the other light" (Sacré, Gaspar 2003,117), which guides the poet to his vertebral alignment with himself and the universe, "Closer to yourself than yourself" (Sacré, Gaspar 2003,180), whisper the poet to himself and to the lector, because in each body circulates the movement of the energy, which manifestations are various, but "nevertheless, somewhere / it is the same thing –"(Sacré, Gaspar 2003,196) that emerges "between skin and light" (Sacré, Gaspar 2003,75). In the path of the spinozian monism dear to Gaspar, the gasparian poetry roots the philosophy in the heart of the living to make arise of this a certain light, a certain movement in the subtile parts of the being. With his poetry, literally, as Marc- Mathieu Münch affirms, "Literature do not make sense, it makes life." (Münch 2004,145).

1. Picture on line, https://enkidoublog.com/2016/02/19/lorand-gaspar-le-poete-des-differences-et-des-syntheses.

References

Debreuille, Jean-Yves. 2007. *Lorand Gaspar.* Paris: Seghers.

Gaspar, Lorand. 1966. *Le Quatrième état de la matière*, Flammarion, "Poésie", without place.

Gaspar, Lorand. 1978 *Approche de la parole.* Paris: Gallimard.

Gaspar, Lorand. 2001 (1982). *Sol absolu et autres textes.* Paris: Gallimard, "Poésie".

Gaspar, Lorand. 1997. *Feuilles d'observation.* Paris*:* Gallimard.

Gaspar, Lorand. 2010. *Derrière le dos de Dieu.* Paris: Gallimard.

Gaspar, Lorand, Margantin, Laurent. "Respiration de flûte dans le poids du calcaire. Entretien Lorand Gaspar / Laurent Margantin". https://remue.net/revue/TXT0310_MargGasp.html.

Laffont-Bissay, Marie-Antoinette & Nouairi, Anis, assisted by Née, Patrick. 2015. *Lorand Gaspar et la matière-monde.* Paris: L'Harmattan.

Lee, Ufan. 2002. *Un art de la rencontre.* Arles: Éditions Actes Sud.

Cahier, Seize & Lançon, Daniel, eds. 2004. *Lorand Gaspar* . Cognac, Le temps qu'il fait.

Münch, Marc-Mathieu. 2004. *L'Effet de vie ou le singulier de l'art littéraire.* Paris: Honoré Champion.

Sacré, James & Gaspar, Lorand. 2003 "Mouvementé de mots et de couleurs", Le temps qu'il fait, Cognac. https://enkidoublog.com/2016/02/19/lorand-gaspar-le-poete-des-differences-et-des-syntheses

Schaffner, Alain. 2017. "Médecine et littérature selon Lorand Gaspar". In *Lorand Gaspar, archives et genèse de l'œuvre* edited by Anne Gourio, Daniele Leclaire, 269-278. Paris: Classiques Garnier.

SCIENTIFIC FRAGMENTS OF EMILY DICKINSON'S POETRY IN ART: A COMMENT ON JANET MALCOLM'S CUT UP BOOKS

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"After all, the literature around us is now unmistakably a planetary system. The question is not really what we should do – the question is how."

Franco Moretti, *Conjectures on World Literature and More Conjectures* (2000/2003)

Introduction

Through a historical review on the reflective approaches regarding to the picture of the world, one of the main philosophical endeavours observed, is the one that makes its description an imperative requirement. The main reason that this descriptive shape became so indispensable is the demanding nature of people who struggle to discover the materials of the world as such. Through description, one could provide an imaginary visualization and potentially – through more structured descriptive shapes – define the scenery all round.

The initial structure provided in a descriptive shape primarily derives from a conjecture. As far as the act of interpretation is concerned, the necessity is indulged by the conjecture. Following that, conjecture leads either to a conception or a representation and a philosophical theory. In the case study of conception, a free idea emerges and hereafter immerses into a systematic exposure with non-scientific content; according to this sequence, literature occurs. The need of producing literature is vital as through literature one not only creates a description, but also expresses their own inner thoughts and ideas. Through this process we have the ability to communicate our ideas to the public and the motive to think; we make creative ideas through reading. Albeit, the purpose is to explain how we create ideas and not just to create them.

Furthermore, as Sergio Sismondo put it: "Even if our focus is narrowly on the production of scientific and technical knowledge, then, the study of rhetoric is crucial to understanding what people believe and how they believe it. Once that is granted, there are many different approaches to understanding persuasion, focusing on rhetorical

force or contextually limited topics. There is also more to science and technology than the direct production of knowledge. Scientific and technical writing is tied to a variety of contexts, including the professional and personal contexts of scientists and engineers, questions of the legitimacy of approaches and methods, and broad ideological contexts. Often these contexts can be made visible only by the study of rhetoric, showing the metaphorical connections between discourses, goals, and ideologies." (Sismondo 2009, 156)

The matter of the description of the universe has received immense observation from both scientists and litterateurs; their initial motives are very similar to each other such as placed questions about the inception of the world and the modality of evolution. The difference lies upon the way their reasoning course is expressed; the practical approach is introduced through science and technology, and the theoretical approach combines ideas and theories. Even supposing that this difference divides them into each field, it combines their works under the influence of the historical context in which they are expressed; historicist approaches indicate such significant divisions. These ostensibly different spheres of knowledge, influenced by each other, are sometimes structured in a similar course and make a specific combination. In both scientific and literary discourse, a very crucial term emerges; this term is called metaphor.[1]

Metaphor corresponds to both poetry and science while integrating into their crossroads, in which science and ideology coexist. In literature and especially in poetry, it constitutes a symbolical figure or expression that operates as a more lyrical substitution for another figure or expression that is more literal. In sciences, the term metaphor is crucial in consequence of its descriptive value.[2] This way, the amalgamation of science and literature becomes conspicuous.

Emily Dickinson's figure is quite representative in this context, not only due to the unique style of her introspective and reflexive poetry but also in view of her ability of making this combination well apparent. This immense interest in the representation of her work is not only due to her writing skills, but also because most of her poems remained purposefully unpublished during her lifetime. After the first formal posthumous publication of her poems in 1890, Dickinson's poetry has been taken under recondite consideration and, more specifically, the poems which have scientific content

1. "A figure of speech in which a term or phrase is applied to something to which it is not literally applicable in order to suggest a resemblance, as in 'A mighty fortress is our God.' Compare mixed metaphor, simile (def 1). / Something used, or regarded as being used, to represent something else; emblem; symbol." Source: Dictionary.com Unabridged. Based on the Random House Dictionary 2015.

2. "However, almost every scientific framework depends upon one or a few key metaphors (Hesse 1966; Haraway 1976), and work in STS shows that scientific models and descriptions are at least replete with explicit metaphors and analogies. A number of works in the history of science and technology discuss particular metaphors, especially Rhetoric and Discourse 155 ones that have ideological value." "Metaphors in science are crucial as heuristic and conceptual tools (e.g. Hoffman 1985; Nersession 1988), and often serve important descriptive and referential functions (e.g. Ackermann 1985; Cummiskey 1992). The ubiquity of metaphor and analogy in the sciences can be taken as evidence that literal language lacks the resources for easy application to new realms (Hoffmann and Leibowitz 1991) (Sismondo 2009, 154-155).

are the most noteworthy in this context. The historical context in which she wrote most of her scientific poems by framing their content, determines to a great extent their substantial meaning.

The main purpose of this paper is to explore interwoven aspects of the scientific and literary discourse in Dickinson's poetry, and the visualization of her late writings –as found in Marta Werner's book– in Janet Malcolm's exhibition, aiming at reaching an explanation regarding metaphysical issues. These discursive aspects, captured by the visual arts, provide images implicating collaboration not only in their content but also in their structure. It can be conveniently observed that while one structures the written text, they depict a representation of letters. The diversified functions of poetry and visual arts are obvious; the most interesting aspect of decoding visual and written "texts" however, is their "structure matters". Suffice it to say, that focusing on the way Dickinson structures her late poems in specie and the greater part of the rest of her poems broadly, one could notice an indirect reference to scientific issues due to their methodological subsequence.

First Part: Emily Dickinson's poetic inheritance

Towards a critical review of Dickinson as a remarkable literary figure, it is worth noticing her non-systematic approach to themes and patterns; she is still represented as a mystery. Correspondingly, to quote Wesley Day "How many Emilies in a piece of apple pie: how many apples on each tree: how many Emilies…" (Wesley 1971, 32).

This introduces one into a vague image of the poet, similar to that formulated by most of her readers. This vagueness derives not only from her voluntary confinement during her lifetime, but also from her deliberate decision to keep her poems and manuscripts hidden from the audience. Her poetry as such is "the poetry of perfect freedom".[3] However, the absence of criticism referring to her work already constitutes a theme of ongoing discussion.

> Her way of poetry was to prove far lonelier than she expected, for it denied her in her own lifetime all public recognition. The metric innovations might have been tolerated, but in her day no critic of English verse would have been willing to accept her rhymes. (Johnson 1955)

A matter worth mentioned is that she –sometimes indirectly and some other times directly–refused the public recognition and, as a result, all future critics. There was no

3. "The work, that is, of persons who wrote for the relief of their own minds, and without thought of publication. Such poetry, when accumulated for years, will have at least the merit of perfect freedom; accompanied, of course, by whatever drawback follows from the habitual absence of criticism." (Higginson 1964, 20).

intention of addressing her writings, except from her correspondence with her friends and relatives. Thus, the motives behind her will to publish her poems or not, still remains vague. Dickinson approaches interaction in a more indirect way; nonetheless, this does not imply that she was reclusive. Writers and theorists insist on bringing to light her poetic inheritance, even though it is not quite apparent whether they have the right to do so; for she had not prepared all her poems to be exposed in public.

Her endless endeavor to reach an explanation about metaphysical issues, such as mortality, time and eternity, has proved to be far more internal than anyone could imagine. Yet through her "broken words"[4], this endeavor acquires a more theological concept while she describes her thoughts about the sentiment of love[5]. Among these lines but also more broadly, her travels was starting and ending inside the text; there is an interactive procedure in her writings, though, considering the matter of interpretation as such, the discussion proved to be longer.

During the last decade of the 19th century, when Dickinson's first publication made its appearance, the subtle division between her fragments and her completed poems soon became conspicuous. Shortly afterwards, her personal style was revealed and several scholars and commentators coming from several fields started commenting on it. Amid the several comments raised, the splendiferous scientific character some of her poems have, came in the forefront.

Her inspiration in these poems derives mostly from nature; during that same period, scientists working in their laboratories were making improvements on phenomena directly concerning nature, such us electricity and magnetism. These phenomena, not yet absolutely defined, provide such a complex set of meanings and constitute a historical context of adequate information, that science becomes a matter of extended interest during the 19th century. That appears either directly –scientific words– or indirectly –scientific context and content– in Dickinson's poetry. Nevertheless, her inner purpose was to give an answer to her metaphysical and religious problems through this scientific approach and the question as far as the addressing of this answer is concerned, still remains to be seen. [6]

Some literary theorists argue theorists has argued that literature presupposes the interaction between the writer and the reader. Few others embrace this idea from a different perspective, supporting a more general frame in which the text itself provides correlations and functions important to the literary method. This discussion punctuates the limits and possibilities interpretation could provide –or not. The printed version of her poems was not evidently Dickinson's preference. On the other hand, a gaze upon

4. As Dickinson (1878) writes herself in "The widow of Samuel Bowles".
5. "Love makes us 'heavenly' without our trying in the least" (Lundin 2004).
6. "However, Uno, at least, has not only 'cataloged' 'the direct references to science' 'very thoroughly' (17) but has acknowledged its significance, demonstrating Dickinson's use of her knowledge of developments in science and technology to solve her metaphysical and religious problems, while observing God-fearing scientists trying to reconcile their discoveries with what is written in the Bible". (Uno 2012, 26).

her manuscripts, leaves the poems open to interpretation as poet herself had left them. Nevertheless, the division between the horizon of the writer and that of the interpreter most of the times is determined by the conceptual and imaginary frame of the text and that is irrelevant to the intention of addressing the poem. After all, as the major French symbolist poet Stéphane Mallarmé argues: "The world exists to end up in a book".

Second Part: Scientific context and content

Thinking about Dickinson, her readers would imagine a woman dressed in white, walking in her house, then looking outside the window with one of her hands in her dress pocket holding a small piece of paper covered in letters. Her attitude might have appeared conservative, though she refused to compromise with the stereotypical society in which she managed to live in her own way. Her writings as such constitute not only cultural functions from the era in which she lived, but also an attempt to reach the "absolute" knowledge.

Regardless of her isolation, Dickinson wrote a variety of the most representative poems of the historical context by which she was determined[7]; some of them expressed through a direct or more often indirect reference to some metaphysical and thus scientific issues. The theme mostly worth noticing here might be remove the approach through which science appears in her poetry. While scientific fragments penetrate to the poetic content, the whole scheme creates a more structured and less abstract depiction on itself. As a consequence, the reasoning becomes more transparent to the reader.

Withal, at some point, the way in which a poem is structured, often mirrors the way in which a scientific experiment is conducted. The structure of several Dickinson's scientific poems is similar to that of a scientific text; it presupposes a specific reasoning course, even though poetry is usually more abstract. This structure reveals the creative process of the ideas and not just their immersion. A great potential aspect of this assumption could be found in Dickinson's poetry, as a double–entendre derives from from those poems of hers that have scientific content[8]. Her short lines and even more

7. "The main argument of Reading Emily Dickinson's Letters is that knowing what letters meant to Dickinson also tells us what they meant to her culture. The case made so well here that she can be seen as a representative figure, someone who helped to sustain her culture's values, invariably depends on the thousand-plus extant letters. Without them in vies, she seems the misfit, and as quiet as a manuscript in a drawer. With them, however, she made 'letter-visits' (Jane Donahue Eberwein 107). With letters she could pay 'social calls' (Stephanie A. Tingley 64), and we read her 'meetings in letters' (Eleanor Heginbotham 129)" (Eberwein, MacKenzie 2009, abstract).

8. "Peel continues, 'I go much further, arguing that Dickinson sedulously appropriated methodology and imagery from a range of scientific disciplines as part of a lifelong epistemological campaign most vigorously pursued between the years 1855 and 1865' (76). He does indeed go 'much further' with immense and diversified information. For example, in chapter 2, 'Climbing the Hill of Science,' he suggests that the succinct presentation of information 'in short paragraphs, often as axioms,' in science textbooks might have led Dickinson to the 'favor of brevity and interest in definition' (140)" (Uno 2012, 26).

her completed poems are often structured in a way that leads the reader to think of the notes that a scientist tentatively keeps in order to scheme an experiment; and through a literary perspective, that is innovative indeed.

The historical context in which she lived also determined, to a great extent her poetic substances; however, motivation derives from her education. At Amherst University where she studied, she learned that scientific observation proves its excellence through description, and, as long as she was devoted to this point of view, she stayed under its influence. That could be exemplified by the datum that Dickinson uses the word "brain" instead of the word "mind". Brain is usually defined as a physical property, whereas mind merely as a mental property; the word brain alludes more naturally to a metaphysical status. Furthermore, as Camille Paglia put it, "the brain can be an empty echoing space", where "echoing" refers to the author's attempt to communicate her ideas to the audience (Paglia 1991, 625).

Nonetheless, during her brief time at Mount Holyoke College, Dickinson established the use of scientific vocabulary, as her education became more extensive and intense, introducing an interaction with the liberal arts; this interaction provides the key for us to explain the philosophical and epistemological influence under which she created her works. Her endeavor to give an explanation to her metaphysical questions substitutes for the inspiration of her linguistic power. Through an open–minded description, she produces symbolic images, which, combined with the refinement of her character, motivate our imagination. Both reverie images and words borrowed from scientific descriptions shape her metaphor referring to the physical world and the universe. One of her earliest poems entitled as "Arcturus" (1859) underlines this argument.

> "Arcturus" is his other name
>
> "Arcturus" is his other name—
> I'd rather call him "Star."
> It's very mean of Science
> To go and interfere!

In the first stanza, she indicates the importance of a star's substance compared to the importance subscribed to it by its given name. She also accuses the scientific typology in the third and fourth line and, as she would put it, the scientists are God-fearing because they obey to the Biblical terms. Her language is both a medium of expression, constituting, at the same time, an issue for itself. In order to express it, she uses meta-language.

> I slew a worm the other day—
> A "Savant" passing by
> Murmured "Resurgam'—"Centipede"!
> "Oh Lord—how frail are we"!

The second stanza constitutes an observation of the risen nature which is simple and fragile – just like us. The role of the 'Savant' is symbolically expressed as a seer or a prophet whose presence is often appeared in her poems in order to reach an explanation.

> What once was "Heaven"
> Is "Zenith" now—
> Where I proposed to go
> When Time's brief masquerade was done
> Is mapped and charted too.

She refers to heaven as a limit she has the intention to reach. And also, she claims that time and history can be captured by the human mind. In between these lines and more broadly in most of her poems, she extensively uses remove –as she might put it – "the gift of science", which is the abstraction. The abstraction of nature and the abstraction provided from science are combined as she manages to draw a specific scheme of both metaphorical and literal content; she depicts a frame in which metaphors and similes are making a sequence which provides a literal meaning as well. Through this significant schema, the correspondence between the content and the context starts fading out as the picture is meaningful itself.

Third Part: The depiction of Dickinson's scientific fragmentary poetry

As Dickinson's first publication made its appearance during the last decade of the 19th century, the subtle division between her fragments and her completed poems prevailed. Her personal style was revealed, and a considerable number of theorists started commenting on it. Through those comments, some of her poems' scientific character came into view.

The 19th century is characterized by the emersion of realism in literature; however, Dickinson's themes where inspired by either... or by metaphysical questions which could be categorized as romantic. As far as style is concerned, she seems to be under the influence of Modernism, despite the fact that she chooses these romantic themes. A matter that arises is the way she understands the term poetics[9], both as a cultural and as a scientific term. Furthermore,

> "poetics is distinguished from hermeneutics by its focus not on the meaning of a text, but rather its understanding of how a text's different elements come together and produce certain effects on the reader" (Culler 1997)

9. "Poetics focuses not on the meaning of a text, but rather on our understanding of how a text's different elements come together and produce certain effects on the reader." (Genette 2005, 14)

While these two distinctive terms are often confused in literary criticism to explain Dickinson's approach to the term "poetics", there have been a lot of Discussions on the subject, but only few of them manage to embrace the dynamics of this idea.

This idea recently found a great representation in the visual arts, introduced by Janet Malcolm in her intellectually insightful collage exhibition entitled "The Emily Dickinson Series (2013)"; this exhibition was inspired by Martha Werner's book "Emily Dickinson's Open Folios: Scenes of Reading, Surfaces of Writing". Marta Werner's book constitutes a unique depiction of forty late drafts and fragments of Dickinson. Her innovative approach lies on the visualization of the manuscripts –they first became known as the "52 envelope poems"– in order to be perceived as the representation of a visual object implicating visual details. Her purpose is to encourage the action of reading and and writing within visualisable poems.

In order to underline this prospect, she has cooperated with Martha Nell Smith on the foundation of the "Dickinson Electronic Archives".[10] As the founders point out, one of their purposes is to "Explore the potential of the digital environment to reveal new interpretive contexts –material, cultural, historical, theoretical– for Dickinson's work" (Smith, Werner 2012, 8). This purpose resembles to purpose with the one related to Malcolm's exhibition, adopting Werner's conception of Dickinson's manuscripts is quite notable.

There is another act of resemblance in the correspondence between Werner and Malcolm initiated by the latter, in order to find Werner's book, which was sold out (Malcom 2014). This communication act reminds us of the correspondence that Dickinson herself had with her friends; and that correspondence initiated her own personal, metaphysical and religious quests. Malcolm, in fact, brings to light some "late writings" of Dickinson, and more specifically, forty of her late drafts known as "The Lord Letters". Thereupon, she combines the drafts with astronomical images in a remarkably symbolic way. Through this, she formulates an argument about the relationship between science and literature, constituting the crystallization of their synthesis. The point is that the entire exhibition relies on the spectator's subjectivity and provides a complex set of meanings, rather than a most acceptable truth or a point to be argued.

The most innovative concept in combining these fragmentary handwritten scientific notes with images containing astronomical objects, is that the division between arts and sciences starts fading out.[11] Malcolm, in her artistic experiment, not only demonstrates

10. "From Dickinson's hand (body), to a consumable text on a manuscript or printed page (sent by the poet herself via post or courier, read aloud by Susan and Lavinia to interested guests, then reproduced in print by various editors), to access on a laptop or some other screen." (Smith, Werner 2012, 8)

11. "I also cut out a photograph of a bearded, depresses-looking man named David Peck Todd, an astronomer who was an official observer of the 1874 transit, and later of the one of 1882. Many of the Dickinson fragments read like excerpts from love letters. The consensus among scholars is that these fragments derive from drafts of letters Dickinson wrote to Judge Otis Lord, a widower with whom she is believed to have had a romantic –possibly even sexual– relationship when she was in her late forties. I had never seen a picture of Lord, and in my imagination

the scientific parts of Dickinson's poetry, but also draws an amalgamated form, combining literature and art under scientific influence. Through an attempt to enlighten her metaphysical queries, Dickinson includes in her writings issues just as ethics, aesthetic, theology or scientific themes as physics and astronomy. Furthermore, the pictures of God and nature as such, constitute the most representative figures of her poetry. One of the poems adopting such an approach was written around 1860 and was first published in 1891. It is entitled as "Faith is a fine invention":

> "Faith" is a fine invention
> When Gentlemen can see –
> But Microscopes are prudent
> In an Emergency.

As she uses the simile between the eyes and the Microscopes, the artificial and the natural part of "vision" are juxtaposed. The physical and the technical "point of view" reported in the same text considering to the word "faith" referring to both metaphysical and self-afflicted patterns.

This approach is adopted by Malcolm who sensibly schemes in retrospect a frame between the "Lord Letters" and some astronomical images. Furthermore, the most conspicuous this comparison can be, would be presented in one of Malcolm's collages under the title "The Summer we did not prize". In this piece, an abstract typewritten draft and the pictures of two microscopes and a glass that contains a liquid – that leads us to imagine that it might be a chemical ingredient – are counter displayed. Malcolm adopts the cohesion of Dickinson's methodology, and she skillfully depicts it.

The context is innovative and does not try to explain either Dickinson's motivation or her thoughts; rather the exact opposite: within a visualized relationship between images and words, the artist tries to draw a scheme of the inevitable interaction between the images and the words within the descriptive procedure, and, at the same time, to express it in the visual arts. Malcolm's purpose is to introduce an antithesis by counter–displaying on the one hand Dickinson's notes -an abstract scheme of ideas- and, on the other hand, pictures depicting specific forms. Addressing spectators in this way is ingenious, indeed. Pointing out this ingenious innovation, one can notice that it is related to – similar – older innovations in art, such as Picasso's cubist collages[12] in visual

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the depressed astronomer became a kind of stan-in for him. In the collage called "No", I put Todd's picture above Dickinson's passionate words: 'Don't you know you are happiest while withhold and not confer –don't you know that 'no' is the wildest word we consign to language?" (Malcolm November 2013).

12. "Paris. Nineteenth-century innovations such as impressionism have been widely analyzed in sociological and organizational research (e.g., White and White 1965, Becker 1982, Wijnberg and Gemser 2000), but Cubism is notably absent. The likely reason is that it developed in a way that does not fit easily within the dominant accounts. As I intend to show, neither a movement from the core to the periphery nor the reverse can summarize with high precision the evolution of Cubism. An inductive study of early Cubism gives rise to a third model, where the success of radical ideas is driven by the simultaneous movement from the periphery to the core and

arts. It also appears in literature in the case study of James Joyce's Ulysses[13], as well as in Brecht's dramatic theater[14]. The major common place of these works is not only the radical ideas emerging from them, but also the fragmentary function of description.

Conclusion

In conclusion, through the attempt to describe the universe, different codes of description are combined. Science and literature are using different arguments in order to describe this "astronomical picture". Thus, the motive still remains the same; the need for knowledge. Through this motive, the articulation in literature becomes very similar to this described in sciences, and the most important part introduced: here, is that knowledge should be accessible through every context. Especially, between the different approaches, the content of knowledge becomes increasingly broader. As Michel Foucault argues, "Knowledge is not for knowing: knowledge is for cutting."

On the point of trying to describe the universe, one could make thoughts about its materials, its initial form. Trying to describe it through words, and placing them together, one makes sentences which have either scientific or linguistic content. Emphasis is placed on the "shape" of the created structure; the content does not necessarily provide the imaginary visualization someone needs in order to make a description. Thereupon, we could invoke Holland Cotter's words: "Shapes rather than words are the first things that register. And even when the words start to come into focus, the book's design encourages us to think of them first as components of visual objects. Are they art? Sure. Why not. But they are something else –poetry– before that."

However, the most insightful surveillance of Dickinson's poetry derives from her own pieces. Thus, one of her most momentous poems follows.

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the reverse. The contribution of the study is in identifying as the trigger for this development two structural conditions, field-level fragmentation and ambiguity, which encouraged radical novelty by reducing both the costs of experimentation in the periphery and the core's resistance." (Sgourev 2003, 2).

13. "Moreover, while writing the book, Joyce devised a schema or plan to describe its structures. He assigned to each episode not only a legendary title, but also a time, a colour, a technique, a science or art, an organ of the body and a symbol. The following fragments are short samples from each episode; an introduction to Joyce's style of writing and to the novel 'Ulysses'." (Goris, Joyce 1992)

14. "This is possibly the most precise operation to perform on a Brecht's play: only such a linguistic, visual and therefore semiotic experiment is able to give back the essence of such unpredictable and detonating dramaturgical device. Every single step of this (even too) intellectual discourse is taken avoiding any possible fluidity, rather pointing to be not fluid at all, with the pace of the dynamite explosion to demolish a building. Fatzer as an icon, as a homo novus who has skipped too many evolutionary steps; it is a liquid, jelly-like dramatis persona, a paradigm suddenly suitable for any character; to the point that every actor will take turns playing that role." (Lo Gatto 2012, 2)

THIS is my letter to the world,
That never wrote to me, –
The simple news that Nature told,
With tender majesty.
Her message is committed
To hands I cannot see;
For love of her, sweet countrymen,
Judge tenderly of me!

References

Anderson, Joyce. 2013. *Emily Dickinson: The Gorgeous Nothings*. Special to the Jewish Times, Dimensions International.

Cotter, Holland. 2013. "A Poet Who Pushed (and Recycled) the Envelope." *New York Times, C32,* 2013.

Culler, Jonathan. 1997. *Literary Theory: A Very Short Introduction*. United Kingdom: Oxford University Press.

D'haen, Theo, César, Dominguez & MadsRosendahl, Thomsen. 2013. *World Literature, A reader*. United Kingdom: Rutledge.

Day, Wesley. 1971. *"Emily Dickinson & Apple Pie" Emily Dickinson: Letters from the World*. United Kingdom: Corinth Books.

Dickinson, Emily. "Epigram". https://www.poeticous.com/emily-dickinson/life-epigram?locale=en

Dickinson Electronic Archives. 2012. Martha Nell Smith and Martha Werner, "Dickinson Electronic Archives." http://www.emilydickinson.org/

Dictionary.com Unabridged. 2015. Based on the Random House Dictionary, © Random House, Inc. http://dictionary.reference.com/

Eberwein, Julie D. & MacKenzie Cindy. 2009. "Reading Emily Dickinson's Letters: Critical Essays." *The Emily Dickinson Journal* 19(2):113-116.

Genette, Gérard. 2005. "Essays In Aesthetics." Volume 4: 14.

Goris, José, & Joyce, James. 1992. "Ulysses", based on Kiberd Declan, "The Student's Annotated Ulysses." Penguin Twentieth-Century Classics. http://members.home.nl/ja.goris/ulysseschapters.htm

Janet Malcolm's Collages. http://littlestarjournal.com/blog/2013/12/janet-malcolms-collages/

Janet Malcolm Cut Up Books. http://www.nybooks.com/daily/2014/01/27/janet-malcolm-cut-up-books/

Johnson, Thomas H. 1955. *Emily Dickinson: An Interpretive Biography*. United Kingdom: The New England Quarterly Inc.

Lo Gatto, Sergio. 2012. "Fragments of a Revolutionary Discourse (a note on Bertolt Brecht's Fatzer Fragment as staged by Pollesch and FabrizioArcuri)." *Critical Stages* 2.

Lundin, Roger. 2004 (1998). *Emily Dickinson and the Art of Belief*. United States: Wm. Eerdamns Publishing Co.

Paglia, Camille. 1991. *Sexual Personae: Art and Decadence from Nefertiti to Emily Dickinson*. United States: Yale University Press.

Sismondo, Sergio. 2009. *An Introduction to Science and Technology Studies*. United Kingdom: Blackwell.

Smith, Martha N. 2004. "On 'Because I could not stop for Death'". In *Poetry: An Introduction* edited by Michael Meyer. Bedford: St. Martin's.

Smith, Martha N. 2005. "On 'Because I could not stop for Death'". In *The Bedford Introduction to Literature* edited by Michael Meyer. Bedford: Freeman & Worth.

Smith, Pamela H. 2006. "Art, Science, and Visual Culture in Early Modern Europe." *Isis*, Vol. 97(1): 83-100.

Sgourev, StoyanV. *How Paris Gave Rise to Cubism (and Picasso): Ambiguity and Fragmentation in Radical Innovation*. Organization Science, Articles in Advance.

Uno, Hiroko. 2012. "Robin Peel Emily Dickinson and the Hill of Science Review." *EDIS Bulletin, Reading Dickinson in the Digital Ag*e, Volume 24(1): 26-27.

Wentworth, Higginson Th. 1964. *"An Open Portfolio." The Recognition of Emily Dickinson*. Chicago: University of Michigan Press.

Werner, Marta. 1995. *Emily Dickinson's Open Folios: Scenes of Reading, Surfaces of Writing*. Ann Arbor, MI: University of Michigan Press.

"TO LEAVE PARNASSUS AND CLIMB THE RUGGED MOUNTAIN OF SCIENCE" – THEODOROS ORPHANIDIS, POETRY AND SCIENCE IN NINETEENTH CENTURY GREECE

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Introduction

> He climbed science's rugged mountain
> He left Parnassus and embraced Flora
> But even then, he wrote lyrics, but not with a pen,
> But with fragrant flowers, with peons and lilies (Paraschos 1889, 35)

The verses above are taken from a far larger poem, published in the well-known at the time 19th century Greek journal *Poikili Stoa*, in 1889. The poet who wrote them was Achilleas Paraschos (1838-1895). Nowadays completely forgotten, Paraschos was at the time considered the national Greek poet, and indeed, this is how the journal editor hails him in the preface of the specific poem. Paraschos was the first and only Greek poet to receive a government post as a virtual subsidy, so that he could devote his time to poetry uninhibited by monetary concerns. The appearance of one of his poems or a reading by him were considered national cultural events (Dimaras 1972, 308-310). This specific poem by Paraschos mourns the passing of Theodoros Orphanidis (1817-1886), the man whose life and work will form the backbone of this paper.

Who was then Theodoros Orphanidis, whose death would so excite the most famous Greek poet of his era? A first guess would be a fellow poet. A quick search through in the few histories of modern Greek literature in existence does indeed confirm that Th. Orphanidis was a well-known poet, belonging to the poetic romantic movement known as the First Athenian School (Vitti 1971, 180-185; Dimaras 1972, 390-392). However, in literary history textbooks, apart from a consensus that Orphanidis' poetry has not aged well, we find no reference to 'the rugged mountain of science' that Paraschos so prominently mentions. For that, we have to refer to the few histories of Greek scientific practice, which, lo and behold, show Orphanidis to have been the only Professor of Botany in the University of Athens, teaching for almost forty years until his death (Gavroglu et al 2014, 290-291; Karkanis 2012, 663-664). What is common in both accounts is that Orphanidis appears either a poet who incidentally also taught Botany, or as a botanist who just so happened to be writing prize-winning poetry.

This paper is an attempt to offer a different viewpoint. I want to argue that, to understand Orphanidis' work, we have to take into consideration both his poetical production and his scientific work in conjunction. Moreover, both are intrinsically tied to what it meant to be a practicing science scholar in nineteenth-century Greece. Thus, my focus on Orphanidis is not meant to bring to the fore yet another 'white man of privilege', even one placed in an unusual context. Instead, I want to use the colorful life of Orphanidis to show how scientific practice within the neophyte Greek state, and to highlight the ways literary and scientific production borrowed from one another practices and strategies. Thus, while taking the life of Orphanidis as my main consideration, I will also talk about Theodoros Afentoulis (1824-1893), a doctor who also taught in the University of Athens as the Chair of Pharmacology, while at the same time pursuing literary work. My aim is to show that 19th century Greek scientific production can be fully understood only when literary practice is taken into account, and vice-versa. Furthermore, I propose that by treating literary and scientific work separately, important historiographical elements of the era become obscured.

This paper consists of three parts. The first part offers a short biography of Theodoros Orphanidis, framed in the historical context of his era, from the 1820s to the late 19th century. The second part discusses how literary and scientific production intersected in the case of Orphanidis, while the third and final part concludes with some more general remarks on Greek scientific practice and its relationship with poetic production, by focusing on the life and work of Theodoros Afentoulis.

A man and his time

The beginning of the 19th century found the Greek-speaking, Orthodox Christian population scattered all over Europe. While most such populations were to be found in the Ottoman-controlled Balkans and in Asia Minor, there were also successful such communities in Alexandria, Vienna, Marseille, in the Black Sea and of course in the Italian peninsula. Most boasted a strong Greek-speaking, mercantile class, which had helped establish Greek as the language of commerce (Stoianovich 1960, 234-313). Even within the Ottoman empire, the so-called Phanariots, Greek-speaking Orthodox Ottoman subjects so named because they lived in the Phanari suburb of Constantinople, had climbed to the highest positions of Ottoman administration by the end of the 18th century (Philliou 2009, 151-81). The Orphanidis family was a mercantile family initially descended from Chios but based in Smyrna in Asia Minor, which boasted a Greek population for centuries. However, in 1821 what started as minor insurrection in the Balkans soon became a full-blown revolution of the Greek speaking population against the Ottoman empire. By 1827, the revolting populations has elected a Governor, the respected diplomat Ioannis Capodistria, who in turn started organizing a nascent Greek state, even

before its sovereignty was fully recognized by either the Ottoman Empire or the Great European Powers of the era (Russia, France and Great Britain) (Woodhouse 1973). The political turbulence accompanying the Greek Revolution of 1821 forced the Orphanidis family to relocate to the island of Syros, which at the time was a thriving mercantile center under the protection of the Vatican and the French state. Theodoros Oprhanidis and his brother Dimitrios Orphanidis (1820-1898) thus acquired their first education in Syros, one of the few places in the Balkans where high-quality schools existed.[1] Soon after, in 1832, Greece was declared a sovereign state and the underaged Bavarian prince Otto von Wittelsbach (1815-1867) was chosen to become the first Greek king.

Since 1827, the city of Naflpio was acting as the capital of the Greek state, and it is there that the Orphanidis family relocated next. Capodistria had founded a Gymnasium there, to act as both a secondary and higher education institution, the only one in Greece at the time[2]. When the Greek capital was moved in Athens in 1834, the Orphanidis family once again followed suit. Both brothers Orphanidis graduated from the Gymnasium, thus joining the very small, elite circle of young men who could boast a full education.[3] As a result, Theodoros Orphanidis managed to secure a position in the Ministry of Foreign Affairs. However, the appearance in Greek polity of a Bavarian administration, which had very specific plans for an autarchic, centrally controlled state modelled in Bavarian statecraft, created a very turbulent political and intellectual atmosphere (Hering 1992). Orphanidis consciously chose to take part in the politics and debates of his era. Following many Greek intellectuals of his era, and especially the brothers Soutsoi, he chose poetry as way to engage the political and cultural field of his era (Politis 2008, 112-117). He was also active in one of the few Greek theaters, in which he taught actors and translated French plays.[4]

Orphanidis took part in demonstrations and also wrote satirical verses against the Bavarian administration and their allies. However, there is marked reluctance to attack the underaged king Otto himself, which Orphanidis pictures as a well-meaning monarch led astray by his advisors. His interventions and most notably, his participation in the celebration of the 25th of March, the mythic date where the Greek Revolution against the Ottoman Empire was launched, led Orphanidis to stand trial in 1841, where he allegedly presented his case in rhymes (Orphanidis 1841). His powerful rhetoric and charismatic personality attracted the attention of powerful political figures, such as the noted advocate and future University of Athens professor Periklis Argiropoulos (1801-

1. This information is based on Orphanidis' own recollections, as they appear in the letter published after his death Orphanidis 1887, 255.
2. The distinction between secondary and higher education was quite fuzzy at the time, not only in Greece but all around Europe. For a comparative history of Greek education, see Kiprianos 2004.
3. For a discussion of the role of the family in Greek scientific affairs of the period, see Tampakis, Vlahakis 2015.
4. It is as one of the founders of the Greek theatre that Orphanides also appears in histories of Greek theatre and historical novels. See Laskaris 1939.

1860), and the powerful politician Ioannis Kolettis (1773-1847). The latter made sure that Orphanidis was acquitted of all charges. Kolletis also secured for Orphanidis a four-year scholarship in Paris (Ampelas 1916, 27).[5] To the surprise of many of his acquaintances, Orphanides came back in 1848 with a Diploma in Botany, having worked with Andrien de Jussieu (1797–1853), Adolphe Brogniart (1801-1876), and others in the French Museum d'Histoire Naturelle and in the University of Sorbonne. In 1850, he became the Professor of Botany in the University of Athens, a position he held until his death.

With his return in Athens, Orphanidis became the social lion that people would later remember him for being. His house in the center of Athens was renowned for its garden, and many literati, intellectuals and poets – such as Achilleas Paraschos –were to be found there. Its close proximity with the Royal Gardens also enabled Queen Amalia herself to visit Orphanidis from time to time. He in turn named a species of camellias after her (Ampelas 1916, 36). As a member of the Athenian elite, Orphanidis wrote often in newspapers and journals. He had no qualms against initiating and sustaining very public debates on poetry, politics or the academia, in which he brought his famous scathing wit to bear. He was, however, also ready to forgive. An example is his famous fight with Georgios Zalokostas (1805-1858), a military officer and poet. Both Zalokostas and Orphanidis submitted a poem for the 1854 Ralleios poetical competition, which at the time was one of the main cultural events in Greece.[6] The judges thought that Zalokostas had written the better poem, but gave the first prize to Orphanidis, due to the strict linguistic provisions of the competition, which allowed submissions only in *Katharevoussa* rather than in the vernacular.[7] Zalokostas and Orphanidis engaged in a vicious public fight over the result for many months (Orphanidis 1856, 546-552). However, just two years later, Orphanidis would write a glorifying obituary for Zalokostas, lamenting the loss of a great poet (Orphanidis 1858, 295-296). Such feeling seemed to be reciprocal and extending beyond poetry. Orphanidis had another poignant public debate with Theodor Von Heldreich (1822-1902), a Bavarian botanist who came to Greece alongside king Otto and became Greek in all but name. Heldreich worked alongside Orphanidis in compiling Greek Herbaria, but the two men came to blows when they both vied for the position of the director of the Natural History Museum of the University of Athens. Under the pretense of discussing the status of the Museum's botanical collections, several pamphlets and articles with *ad hominem* accusations were exchanged in 1865 (Orphanidis 1865, 1865a; Heldreich 1865). And yet, it was Theodor Von Heldreich

5. For a Bourdieusian analysis of the patronage of intellectuals, see Petmezas 2009.

6. For the importance of the competitions, see Moullas 1989.

7. The Greek state had adopted early on a highly formalized, artificial language based on classical Greek called *Katharevoussa* (Clean Language) as its official language. The rationale was that national purity and greatness should start by purging Greek language from all foreign, especially Turkish and Slavic, influences. However, the vernacular language that Greek people actually spoke diverged greatly from *Katharevoussa*, spawning a fierce debate about language that reached well into the 1970s, almost 150 years after the institution of *Katharevoussa*. For an excellent account, see Mackridge 2009.

who wrote Orphanidis' scientific obituary in 1887, once again in glorifying praise (Heldreich 1887, 271-282).

In his final years, Orphanidis took place in most of the great political events of his era. When King Otto got deposed in 1862, Orphanidis was part of the National Assembly which prepared the arrival of Otto's successor, King George I (1845-1913) and a new Greek Constitution. By then, Orphanidis had been in the public spotlight for thirty-five years and was losing his appetite for dramatic confrontations and interventions. He gradually withdrew from public affairs, but he continued to enjoy a reputation as a scientist and a poet. His death in 1886 brought a deluge of obituaries, eulogies and articles, including the one from Paraschos at the start of this paper. Contemporary criticism aside, Theodoros Orphanidis continued to be remembered and revered even forty years after his death, and his poems were part of the Greek school curriculum during the last decades of the 19th century.

The botanist and the poet

When coming across a person like Orphanidis, it is tempting to consider his multifaceted cultural and intellectual production as a hobby, or as a personal quirk. The aim of this second part of this paper is to show how for Orphanidis, for his fellow scholars and scientists and for the public sphere at large, science and poetry were intertwined. Moreover, Orphanidis' role as a scientist depended on strategies enabled by being a poet, and vice-versa.

Orphanidis first appeared as a poet and a columnist in newspapers very early on. He published his first poetical collections, *Μένιππος I* and *II* before he turned twenty (Orphanidis 1836, 1837). After those, he published again in 1841 the compilation *Τοξότης,* based on works appearing in the journal of the same name, and in 1842 the poem *Ο πρωτομάρτυς Ρήγας και η ελληνική επανάστασις* (Athens: Pantelli). However, it is only in 1854 that his next poem, *Άπατρις*, appears in print, followed by *Η πόλις των Αθηνών* in 1855. Thus, for four years after his return from Paris, Orphanidis published no poems at all. Instead, he devoted himself to Botany, going into many botanical excursions in and around the Greek state of the time.[8] He discovered, cultivated and named several flowers and was busy teaching in the University of Athens and creating his famous garden in his house. And yet, it is exactly in 1856, at the time Orphanidis reappeared as a poet, that we see how the image of the poet and of the scientist are co-produced and mutually reinforce each other. The occasion was the Ralleios competition of 1854, which Orphanidis won with his poem *Άπατρις* against Zalokostas. Accepting the prize, Orphanidis climbed

8. By the 1865, Orphanidis has organized and headed more than ten botanical excursions. See Heldreich 1887, 274.

the podium to declare that half of the monetary prize would be devoted to scientific journeys within Greece. He also announced that one set of his botanical collections he would gift to the University of Athens and another to any European University of the judges' choice. In that way

> ... poetry would help science, and the laurel of Apollo would mingle, not in vain, with the best flowers of Greek flora (UA 1854, 39).

Thus, Orphanidis the poet brings to the spotlight Orphanidis the scientist, and immediately declares that poetry and science should work hand in hand. The same happens when Orphanidis answers Zalokostas' allegations two years later. Narrating his reactions when Zalokostas had won the 1851 Ralleios competition, Orphanidis writes

> And I... congratulated you and cheered for your success, and, with the help of Linnaeus, and Jussieu and Candolle I was so deeply involved in my studies of our country's hyacinths, that I forgot that ... I had the power to write as before lyrics, if not to win competitions, at least then to lose in them (Orphanidis 1856, 547).

Here, the scientist comes to the aid of the poet: Orphanidis was not writing poetry because he was deeply immersed in his scientific studies. His scientific credentials are brought forth to explain poetical misgivings. Later on in the same letter, scientific practice will do a lot more. Discussing the 1855 competition, Orphanidis wrote

> (for the fifth competition) I put it my heart to also write a poem and submit it· and by bringing to bear my experiences from my scientific trip to Boeotia and Parnassus, I passed my difficult days writing the poem "Ο Πύργος της Πέτρας"... (Orphanidis 1856, 548)

> ...if you decide to heap insult upon insult (in your reply), and since it is not a pastime of mine to indulge in debates via newspapers as I have my scientific practices to pursue, know that ... I will answer all such attacks in my forthcoming satirical poem (Orphanidis 1856, 551).

Thus, for Orphanidis the poet, his scientific practice is at once a resource, a haven and a motherland. He can draw arguments and inspiration while the setting the tone of a debate, *as a* poet, *by* being a scientist. It is not in vain, that, when awarded the first prize in the poetical competition of the University, Orphanidis declared publicly that he would gift two copies of his botanical collection, his life's whole scientific work, to any two institutions the University deemed worthy. Reciprocally, Orphanidis the poet expresses his gratitude through the deeds of Orphanidis the scientist.

It is not, however, only in his private affairs that Orphanidis mentions botany as a poetical resource. As one of the judges for the Voutsinaios poetical competition, which succeeded the Ralleios competition in the 1870s as the main national cultural event,

Orphanidis writes in 1876 that, to become a good poet, one needs, among other traits, a 'thorough and practical knowledge of nature' (Orphanidis 1876, 5). Finally, in his silver years, when he had finally withdrawn from the public sphere, Orphanidis was quoted saying

> Having left the field of political debating fifteen years ago, two divinities I now worship, either as a hermit withdrawn in my home, either while climbing the tall and glorious mountains of my homeland: The Science of Botany and Poetry. Various uncultured souls say to me 'Leave Poetry!', tomorrow they might say 'Leave Science!", that is, annihilate yourself, become a beast like us.
> Never, by God! This I will never do, as long as I have a breath and an intellect (Chronopoulos 1886, 32).

For Orphanidis, and until the very end, his poetical and scientific practice were part of a coherent, holistic identity, which also included his patriotic service, his theatrical productions and all other facets of his intellectual identity. The idea that such activities are disparate or even mutually exclusive would be abhorrent to him. His peers and fellow scholars seemed to agree with him. Not only is he never criticized for 'going beyond the boundaries of his expertise', but in fact eulogies and obituaries for Orphanidis purposefully emphasize how Orphanidis' poetry and his science go hand in hand. A striking example is the poem by Paraschos which can be found in the beginning of this paper, in which Orphanidis is said to write lyrics 'not with a pen, but with flowers.' A few years earlier, just after Oprhanidis' death, we read in one of his obituaries, as it discusses various Orphanidis' poems

> ...What art, what rhythm, what harmony is concentrated in just a few lyrics!
> And further on, without eclipsing the poet, the botanist and naturalist arise in this following (poetical picture)... (Chronopoulos 1886, 30)

His erstwhile botanical opponent, Theodors Von Heldreich, wrote in the beginning of Orphanidis' scientific obituary that 'Orphanidis, as a poet, brought poetry into science' (Heldreich 1887, 271). Finally, thirty years after his death, one of his earliest biographers would write

> Orphanidis combined his dual substance as a poet and a scientist excellently. For him, Greek flora was the tenth Muse, which inspired and helped him... in his poetical descriptions of the beauty of nature (Ampelas 1916, 36).

Science as the Tenth muse, but also poetry as a facilitator of scientific practice: This is what the life of Theodoros Orphanidis exemplifies.

Conclusion: One more Theodoros

It now remains to be seen if Orphanidis' case is just a curious anomaly, or if he represents a more general trend. Where there others who climbed both "Parnassus and the rugged mountain of science"? Before moving on to answer such a question, it is worth noting that the community of people that could be considered *bona fide* science experts in 19th century Greece was very small. At any specific year from 1830 to 1890, there were less than twenty people who could claim such an expertise.[9]This is the reason the career of a man with the prominence of Orphanidis is of special interest. Even so, Orphanidis was not the only one to be recognized as straddling both science and literature. The Professor of History Pavlos Karolidis (1849-1930), writing in 1922 but old enough to remember the times of Orphanidis and his milieu, laments in a footnote of his multi-volume History of Greece the state of academia in his time by comparing it to the past (Karolidis 1922, 252):

> The German system that was established [in Greece] from the founding of the University prospered marvelously for two generations by binding theologians, philologists, philosophers, mathematicians and physicists and lawyers and doctors in a common bond of nurturing Greek letters and through a devotion to Greek philology and history...
> [Examples were] in Natural History, the classicist and Latinist Hercules Mitsopoulos, the great chemist and learned classicist Landerer, the renowned mathematician V. Lakon, an expert translator and commentator of Greek authors such as Sophocles and Aristotle [...], from the doctors, Theodoros Afentoulis, a zealous mystic of classical Greek philology ...

All the above-mentioned scholars – H. Mitsopoulos (1816-1892), Xaver Landerer (1809–1885), V. Lakon (1830–1900) – were prominent mathematicians and scientists, with established credentials as poets and authors. Karolidis could have easily mentioned double that number, since most, if not all, science experts also worked in philology, poetry or literature.[10] However, for the purposes of this paper, we will conclude by looking briefly at the career of the last scholar mentioned, that of Theodoros Afentoulis.

Theodoros Afentoulis was born in Zagora in 1824, in lands, like Orphanidis, that at the time were not part of the Greek State. He was a prominent doctor and public persona and his statue still exists in Piraeus, the town where he lived and worked for most of his life. In the first- and for most purposes, only- history of the School of Medicine of the

9. For a discussion of the demographics of Greek science and the role of education in its establishment, see Tampakis 2013, 789-805.

10. For a more detailed analysis, see Tampakis 2014, 217-237 and Tampakis 2015, 438-455.

University of Athens, we read that Afentoulis was educated initially in Athens and then moved on in Munich (1843) and later on in Paris and Budapest, acquiring a professorship right about the time that Orphanidis also did, in 1852.[11] In fact, after Orphanidis retired, Afentoulis also taught Botany until 1893, the year of his death. So far, Afentoulis' life reads as a typical example of a 19th century distinguished medical doctor. But then, his biographer goes on to say (Kouzis 1939, 21).

> A diligent follower of Apollo [Afentoulis] found rest in the Muses and regained his energy. He published three volumes of literary works, including the "Festival in Olympus", the "Alcaic Odes" (1881) and the translations of "Nathan the Wise" of Lessing (1880) and Schiller's "Mary Stewart" (1882), showing [Afentoulis] to be an inspired poet but also the distinguished judge of the Voutsinaios and Oikonomeios poetical competition

As in the case of Orphanidis, once again we see the biographers of Afentoulis going out of their way to mention Afentoulis' poetical and literary work along side his scientific and intellectual achievements. And the similarities do not end there. Afentoulis took also part in the National Assembly of 1862 and became its Vicepresident in 1863 and was known throughout Athens and Piraeus for his wit and culture. He was one of the first to demand the protection of Greek forests and of Greek birds, and, most prominently, directed the Tzanneion Hospital in Piraeus until his death. His social eminence and his untiring medical work had given him the nickname of the 'Patron saint of Piraeus' and he was the beneficiary of several medals of merit, from Greece, Italy, France and Russia (UA 1888, 17).[12] His funeral was allegedly attended by thousands, and his death was a cause for public lament. In his obituaries, we once again encounter descriptions of Afentoulis as 'respected teacher', 'not only a doctor, but a poet and a scholar', 'a true scholar and hierophant of the Muses', 'distinguished in literature and language as in medicine' and 'a true synthetic spirit'.[13]

Like his contemporary Orphanidis, Afentoulis did not just write and publish poetry. He acted as a judge of translations for the all-important poetical competitions of his era. His decisions in the 1873 Oikonomeion poetical competition (Afentoulis ruled that no translation was good enough to win the prize) earned him the public enmity of Filopoimin Paraskevaidis, who expressed his displeasure in a series of public pamphlets and articles. Afentoulis responded in kind. Despite the viciousness of the debate, not once was there a mention that Afentoulis was overstepping his disciplinary boundaries or

11. Until noted otherwise, Afentoulis' biographical data come from Kouzis 1939, 20.
12. It is worth mentioning that this article was written when Afentoulis was still alive.
13. These references are taken nor only from *Kleio*, but also Paganelis (1893), "Θεόδωρος Αφεντούλης", *Efimeris* 99, 1; K.K. (1893), "Θεόδωρος Αφεντούλης", Neologos 28, 593; and UA, (1891), "Θεόδωρος Αφεντούλης", Himerologeion Skokou 6, 92-94.

that he was unqualified to act as a judge (Paraskevaidis 1875, 1875a). Even in disputes about his scientific work, Afentoulis often found himself defending his use of language and terminology.[14] In each and every case, we see that Theodoros Afentoulis used language and poetry as resources in scientific debates, while his literary work is always tied to his eminence as a scientist. Both literary and medical practices contribute to his public persona, and the public lionizes him not despite, but because of what we today would call his dual mastery of science and poetry. However, it is equally evident that no such firm distinction exists in the Greek public sphere at the time, or in the mind of Afentoulis himself.[15]

The parallels between Orphanidis' and Afentoulis' cases concerning their work as literary scholars and scientists are obvious, even from the brief descriptions offered in this paper. The lament of Karolidis quoted above shows that such intellectual and cultural trajectories were neither uncommon nor undesirable. The aim of this paper was to show that scientific and poetical practices not only went hand in hand, but often acted as twin and intertwined sources of social and cultural capital for most of the Greek scientists of the era. Furthermore, I would like to propose that an intellectual history of the Greek space of the era would not make much sense, if such affinities were not taken into consideration. Whole dimensions of scientific practice, from the legitimization of science and scientists to the nature and role of public disputes and debates make sense only when viewed as been undertaken by scholars with vested interests in fields larger than 'mere science' or poetry. But we already know what Orphanidis would say:

> Abandon poetry for science? Abandon science for poetry? Annihilate myself, become a beast? Never, by God! This I will never do, as long as I have a breath and an intellect

14. See the attack on Afentoulis by another Botanist and future Professor of the University, Spiridon Miliarakis, in Miliarakis1886, 1886a.

15. A notable exception is the eulogy published by Petros Apostolidis in Poikili Stoa in 1894 (pages 257-275). Apostolidis honors Afentoulis and describes him as one of the most important Greek scholars of his time. However, he also makes a careful distinction between his scientific and poetical works, considering the latter as unavoidably but brilliantly amateurish. Apostolidis, himself a practicing doctor, would follow a stellar career as a journalist, author and critic under the pseudonym Pavlos Nirvanas, and would take a leading role in the heated linguistic debates of the time. This distinction reflects more Apostolidis' own ideological transformation of the time and his insistence in poets-as-Nietzscean-supermen. For a brilliant discussion of Nirvanas, see Matthiopoulos 2005, 253-286.

References

Ampelas, Timoleon. 1916. *Ο Θεόδωρος Ορφανίδης και η εποχή του.* Athens: Sakkelaridou.

Chronopoulos, Efstathios. 1886. "Theodoros Orphanidis." *Poikili Stoa* 6 (1): 32.

Dimaras, Konstantinos. 1972. *A History of Modern Greek Literature*. New York: SUNY Press.

Gavroglu, Kostas, Karamanolakis, Vangelis. & Chaido Barkoula. 2014. *Το Πανεπιστήμιο Αθηνών και η ιστορία του (1837-1937)*. Herakleion: University of Crete Press.

Heldreich, Theodore. 1865. *Απάντησις Θ δε Χέλδραϊχ γενικού επιμελητού του φυτογραφικού μουσείου του Εθνικού Πανεπιστημίου: Εκ το υπό του καθηγητού Θ. Γ. Ορφανίδου δημοσιευθέν φυλλάδιον το επιγραφόμενον "Η κατάστασις του φυσιογραφικού Μουσείου του Πανεπιστημίου".* Athens: University Press.

Heldreich, Theodore. 1887. "Ο Θεόδωρος Ορφανίδης ως βοτανικός." *Hemerologion Skokou* 2: 271-282.

Hering, Gunnar. 1992. *Die politischen Parteien in Griechenland, 1821-1936*. Vol. 1. Oldenbourg: Verlag.

Karkanis, Ilias. 2012. "Οι φυσικές επιστήμες και το Πανεπιστήμιο στην Ελλάδα του 19ου." Phd Diss., Athens: NTUA/NKUA.

Karolidis, Pavlos. 1922. *Σύγχρονος ιστορία των Ελλήνων και των λοιπών λαών της Ανατολής από του 1821 μέχρι του 1921.* Volume B. Athens: Vitsikounakis.

Kiprianos, Pandelis. 2004. *Συγκριτική ιστορία της Ελληνικής εκπαίδευσης*. Athens: Vivliorama.

Kotanidis, George. 2004. *Οι σαλτιμπάγκοι*. Athens: Kastanioti.

Kouzis, Aristotelis. 1939. *Ιστορία Της Ιατρικής Σχολής*. Athens: Pyrso.

Κ. Κ. 1893, "Θεόδωρος Αφεντούλης", *Neologos* 28, 593

Laskaris, Nikolaos. 1939. *Ιστορία του νεοελληνικού θεάτρου*. Vol. B. Athens: Vassileiou.

Mackridge, Peter. 2009. *Language and National Identity in Greece, 1766-1976*. Oxford: Oxford University Press.

Matthiopoulos, Eugenios. 2005. *Η Τέχνη Πτεροφύει Εν Οδύνη: Η Πρόσληψη Του Νεορωμαντισμού Στην Ελλάδα*. Athens: Potamos.

Miliarakis, Spiridon. 1886. *Επίκρισις της μεταφράσεως των Στοιχείων Επιστημονικής Φυτολογίας του Ι. Βισνέρου υπό Θ. Αφεντούλη*. Athens: Konstantinidou.

Miliarakis, Spiridon. 1886a. *Το δεύτερον βοτανικόν δημοσίευμα του Κου Θ. Αφεντούλη*. Athens: Konstantinidou.

Moullas, Panayiotis. 1989. *Les concours poétiques de l'Université d'Athènes, 1851-1877*. Athènes: Secrétariat général à la Jeunesse.

Orphanidis, Theodoros. 1836. *Μένιππος Ι.* Athens: Ralli.

Orphanidis, Theodoros. 1837. *Μένιππος ΙΙ.* Athens: Papadopoulou.

Orphanidis, Theodoros. 1841. *Τα Κατά Την Εορτήν Της 25 Μαρτίου Τα Κατά την Δίκην Των Εωρτασάντων Ταύτην Και Έμμετρος Απολογία Θεόδωρου Ορφανίδου.* Athens: Hagathi Tyche.

Orphanidis, Theodoros. 1856. "Επίσημου ποιητικής αλληλογραφίας αριθμός πρώτος." *Pandora* 6(141):546-552.

Orphanidis, Theodoros. 1858. "Νεκρολογία." *Pandora* 9 (204): 295-296.

Orphanidis, Theodoros. 1865. *Η κατάστασις του Φυσιογραφικού Μουσείου του Πανεπιστημίου*. Athens: Drakos.

Orphanidis, Theodoros. 1865a. *Ψευδολογιών Χελδράϊχ το ανάγνωσμα: Απάντησις προς την υπό του Φον Χελδράϊχ ανυπόστατον δικαιολόγησιν περί των του Μουσείου.* Athens: University Press.

Orphanidis, Theodoros. 1876. *Κρίσις του Βουτσιναίου Ποιητικού Αγώνος του έτους 1876.* Athens: Vlastou.

Orphanidis, Theodoros. 1887. "Επιστολή ανέκδοτος." *Poikili Stoa* (1): 255.

Paganelis, Theodoros (1893), "Θεόδωρος Αφεντούλης", *Efimeris* 99, 1

Paraschos, Achileas. 1889. "Ελεγεία δια τον Θεόδωρο Ορφανίδη." *Poikili Stoa* 8 (1).

Paraskevaidis, F. 1875. *Το πικρόν επιδόρπιον ήτοι απάντησις προς τον Γ. Ε. Αντωνιάδη τον υπερασπιστήν του κριτού των μεταφράσεων του Δάντε Θ. Αφεντούλη*, Athens: Parthenonos.

Paraskevaidis, F. 1875a. *Περί του Θ. Αφεντούλη ως κριτού των μεταφράσεων του Δάντου*, Athens: Parthenonos.

Petmezas, Sokratis. 2009. "From privileged outcasts to power players: The 'Romantic' redefinition of the Hellenic nation in the mid-nineteenth century, In *The making of modern Greece: Nationalism, Romanticism, & the uses of the past (1797-1896)* edited by Roderick Beaton and David Ricks, 123-36. Farnham: Ashgate.

Philliou, Christine. 2009. "Communities on the Verge: Unrevealing the Phanariot Ascendancy in Ottoman Governance." *Comparative Studies in Society and History* 51(1): 151-81.

Politis, Alexis. 2008. *Ρομαντικά χρόνια: Ιδεολογίες και νοοτροπίες στην Ελλάδα του 1830-1880*. Athens: EMNE.

Stoianovich, Traian. 1960. "The Conquering Balkan Orthodox Merchant." *The Journal of Economic History* 20(2): 234-313.

Tampakis, Kostas. 2013. "Science Education and the Emergence of the Specialized Scientist in Nineteenth Century Greece." *Science & Education* 22 (4): 789-805.

Tampakis, Kostas. 2014. "Onwards facing backwards: the rhetoric of science in nineteenth-century Greece." *The British Journal for the History of Science* 47 (02): 217-237.

Tampakis, Kostas. 2015. "The once and future language: Communication, terminology and the practice of science in nineteenth and early twentieth century Greece." *History of Science* 53 (4): 438-455.

Tampakis, Kostas & Vlahakis George. 2015. "Merchants, scientists and artists – Scientific families as agents within the early modern Greek intellectual field." In *Domesticity in the making of modern science* edited by Donald L. Opitz, Staffan Bergwik and Brigitte Van Tiggelen, 175-191. London: Palgrave Macmillan.

UA. 1854. "Εκθεσις του ποιητικού διαγωνισμού του 1854." *Πανδώρα* 98.

UA. 1888. "Θεόδωρος Αφεντουλης." *Kleio* 2 (74).

Woodhouse, Montague C. 1973. *Capodistria: The Founder of Greek Independence.* London: Oxford University Press.

Vitti, Mariio. 1971. *Storia Della Letteratura Neogreca*. Torino: Edizioni Rai Radiotelevisione Italiana.

ZERO AND INFINITY IN MODERN GREEK POETRY

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Mathematics - Poetry

> *... Windows: that's what we need, a wise old man in a distant land once told me, the immensity of the real is incomprehensible, to understand it you need to enclose it within a rectangle; geometry opposes chaos, that's why men invented geometrical windows, and every geometry presupposes right angles. Can it be that our life is also subordinated to right angles?..."* (Tabucchi 2004, 200-201).

Windows are therefore necessary for us to see the reality of the world outside, to "contemplate" and describe nature. And certainly, Mathematics and poetry are such windows, enormous openings, since both are attempts to interpret the world. As Heisenberg repeatedly said, only two languages humans have to face reality with: the language of Mathematics and the language of Poetry.

In Mathematics the filter is logic, in poetry it is emotion. Both help us gain a better understanding of the world and of ourselves, in the sense that Mathematics is a descent into the human mind, while poetry is a descent into the soul. Both paths lead to self-knowledge.

What is Mathematics? Certainly not only formulas, operations, techniques or a useful tool for the other sciences. On the contrary, it has its own light and its own wisdom, over and above any possible scientific application, and the intelligent person who grasps something of its inner meaning will be richly rewarded. Mathematics is also the Pythagoreans' "greatest fruit of learning" or, for others, such as W. T. Tutte[1], "the humanist science that sings the praises of eternal logic", or "the art that shapes structures of ethereal beauty from the primary material called logic"; but above all, Mathematics is pleasure.

What is poetry? "The art of leading you towards what goes beyond you", says Odysseus Elytis (C.P. 2004, 693).

1. William Thomas Tutte (1917–2002), A British mathematician who contributed significantly to the fields of Graph Theory and Combinations. During the Second World War he deciphered a basic German code system, directly influencing the Allied invasion of Europe.

> Poetry delivers us from being held captive by chance events. It creates another existence within existence. It obliges us to feel what our logic tells us and to imagine differently what our knowledge has learnt off by heart, meaning that it creates the world anew (Elytis 1996, 34-35).[2]

Poetry arises at the point where rationality lays down its arms, or, as Novalis tells us in his *Fragments,* "poetry is the representation of the soul, of the internal world in its totality". [3]

True Poetry resembles Mathematics, when it searches for a harmony of speech, such that the slightest addition or removal or transposition of a word reduces or destroys either the musicality of speech or the truth inherent in the verses. Every geometrical shape is a poem of the unit. Every irrational or asymmetric number is a poem of infinity. At a high level of creation, poetry becomes a geometricized balance of meaning and thought. This is where mathematics and poetry intersect. The power of truth is their common element.

Both, Poetry and Mathematics lead to the hidden beauty, in other words the ultimate essence of the world. And according to Paul Dirac, "mathematical beauty can no more be defined than can beauty in art, but those who study Mathematics usually have no difficulty in appreciating it". [4] In his *Mathematician's Apology*, G. H. Hardy (1993, 63) tells us that "beauty is the first test and there is no permanent place in this world for ugly Mathematics". And, he continues,

> it may be very hard to define mathematical beauty, but that is just as true of beauty of any kind; we may not know quite what we mean by a beautiful poem, but that does not prevent us from recognizing one when we read it (Hardy 1993, 63-64)

And Hardy's comparison of Poetry and Mathematics does not end here. Elsewhere he says, "If one has produced anything… whether a geometrical theorem or a poem…" (Hardy 1993, 57), and states that "the beauty of a mathematical theorem depends a great deal on its seriousness, as even in poetry the beauty of a line may depend, to some extent, on the significance of the ideas which it contains" (Hardy 1993, 67).

Nature vibrates to mathematical rhythms, poetry senses a deficiency of art in both Nature and Mathematics. The great poet, through the high art of verse, and the great

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2. The poetic collection 2x7 has not been translated into the English language.
3. Novalis: the pseudonym of Georg Philipp Friedrich Freiherr von Hardenberg (1772–1801), an author and philosopher of early German Romanticism. His major work is *Hymns to the Night* (1800). In his collection *The Elegies of jutting rock*, Odysseus Elytis dedicates the poem "Grüningen Elegy" to Novalis.
4. Paul Adrien Maurice Dirac (1902-1984). British Professor of Cambridge University and one of the most important physicists to influence and contribute to 20th-century physics. His contribution to quantum physics was particularly significant. In 1933 he was awarded the Nobel Prize in Physics for the discovery of new productive forms of atomic theory.

Mathematician, through the abstract beauty of numbers and shapes, meet and commune the apparent but also secret harmony of nature, before both escape on the wings of infinity to the primordial Beauty of uncreated Being.

Among the dozens of mathematical concepts old and new, two, above all, still tantalize mankind: the concepts of zero and infinity. In our paper we will attempt to discover how these concepts are incorporated into Modern Greek poetry. We will run through the poetic corpus, as far as this is possible, in order to see how Greek poets confront the beginning or nonexistence expressed by zero on the one hand, and the illimitability of infinity on the other.

But what is zero? What is infinity? Who discovered them, or rather who invented them? At this point we will try to answer these questions as simply as possible, starting with the story of zero.

Zero

The ontology of zero was first presented during the time of the Presocratics. Zero is identified with the concept of lack and nonexistence. The great philosopher Parmenides said, "*Χρη το λέγειν τε νοείν τ' εόν έμμεναι, έστι γαρ είναι, μηδέν δ' ουκ έστιν*", meaning "It is necessary to say and think that what is exists. For Being, the essence of the universe, exists. Zero, however, does not exist". In Parmenides' philosophy, as we know, "thinking" and "being" are identical concepts. Two thousand years later, Descartes repeated the same observation with the words "*ex nihilo nihil fit*", "nothing comes from nothing".

The first thing to say about zero is that there are two uses of zero which are both extremely important but are somewhat different. One use is as an empty place indicator in our place-value number system. Hence in a number like 5206 the zero is used so that the positions of the 5 and 2 are correct. Clearly 526 means something quite different. The second use of zero is as a number itself in the form we use it as 0.

It was not until around 400 BC that the Babylonians, who had a place-value number system without this feature for over 1000 years, put two wedge symbols into the place where we would put zero, to indicate which was meant, 526 or 52 '' 6.

Of course, the early use of zero to denote an empty place is not really the use of zero as a number at all, merely the use of some type of punctuation mark so that the numbers had the correct interpretation.

To the apparent question, how the brilliant Greek mathematicians did not invent the concept of zero, the answer is that Greeks did not need to name their numbers since they worked with numbers as lengths of lines. Numbers which required to be named for records were used by merchants, not mathematicians, and hence no clever notation was needed.

Now, there were exceptions to what we have just stated. The exceptions were the mathematicians who were involved in recording astronomical data. Here, we find the first use of the symbol which we recognize today as the notation for zero, for Greek astronomers began to use the symbol O. The idea of the zero place makes its next appearance in Indian mathematics. The first record of the Indian use of zero which is dated and agreed by all to be genuine was written in 876. The Indian ideas spread east to China as well as west to the Islamic countries.

Fibonacci was one of the main people to bring these new ideas about the Indian number system to Europe., but he was not bold enough to treat 0 in the same way as the other numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 since he speaks of the "sign" zero while the other symbols he speaks of as numbers. By the 1600's zero began to come into widespread use, but still only after encountering a lot of resistance. So, after so many years, as the poet Pandelis Boukalas says in his poem *Gravity*,:

> So many gods have prepared zero for us
> Now it is the time of man (Boukalas 2000)

Of course there are still signs of the problems caused by zero. Recently many people throughout the world celebrated the new millennium on 1 January 2000. Of course they celebrated the passing of only 1999 years since when the calendar was set up no year zero was specified. Although one might forgive the original error, it is a little surprising that most people seemed unable to understand why the third millennium and the 21st century begin on 1 January 2001. Zero is still causing problems!

Infinity

The concept of infinity was first introduced by the pre-Socratic philosopher Anaximander and forms the center of his teaching. The etymology of *άπειρον*, Greek for infinity, is *α+πέρας*, i.e. without limits, without limitations, and also *α+περάω*, that which cannot be penetrated. Anaximander placed infinity at the origin of the creation of the universe, as an indefinable essence from which, by a process of ever more specific figurations, were formed the four elements (earth, water, air and fire) and the objects of which the world we experience is comprised. He attributes to it the properties of being unlimited in space (in extent and duration), of being qualitatively indefinable (in the sense that it is not identified with any of the known elements), of divinity, of immortality, and of being the beginning of all beings, naming the principle for the first time.Infinity, this furthest-ranging ray of Thought, finds its most vivid self-consciousness and expresses its most fertile activity in Mathematics. Let us experience this in two examples: in the familiar sequence of natural numbers 1, 2, 3 ..., which never ends, all the subsequent numbers are attracted by infinity, the three periods of the ellipsis shout it out. The sphere,

too (or the circle, its two-dimensional equivalent), that supreme abundance of equality and symmetry, gives us through its finite size the most artistic view of infinity, being the location of the innumerable points at a distance from its center equal to its radius.

> The infinite! No other question has ever moved so profoundly the spirit of man; no other idea has so fruitfully stimulated his intellect; yet no other concept stands in greater need of clarification than that of the infinite.[5]

That' s what D. Hilbert states and Konstantinos Caratheodory adds "If you wish to reach infinity know the finite in all its expressions".

The most commonly seen infinity symbol is the sideways figure eight, which is actually the curve known as the "lemniscate of Bernoulli", introduced by the British mathematician John Wallis (1616-1703).

This symbol was first used in the 17th century in a treatise on conical sections. It was quickly accepted and soon came to symbolize infinity or eternity in a variety of contexts. In the 18th century, for instance, the infinity symbol began to appear on the Tarot card of The Mountbank or Magician. In an interesting coincidence, the cabbalistic symbol associated with this card is the Hebrew letter *alef*, the same letter that Georg Cantor, the founder of modern mathematical infinity theory, used to symbolize the first infinite number.

It should be noted that the symbols $+\infty$ (plus infinity) and $-\infty$ (minus infinity), by which we symbolically represent the concept of infinity, are not numbers and must be used with great care. We must not be misled by the fact that many properties of mathematical operations also apply to these symbols.

It is worth mentioning that the Fathers of the Western Church in the Middle Ages did not allow the mathematical manipulation of meaning, since that was a property of God. St Augustine said: "Only God and His thoughts are infinite". It is striking, however, that the Church fathers denied God the ability to create the infinite. In his *Summa Theologica*, St Thomas Aquinas admits that, although God is omnipotent and boundless, He cannot create boundless things.

Zero, infinity in neohellenic poetry

In Modern Greek poetry the concepts of zero and infinity appear quite often in a variety of ways. Zero sometimes emerges from the poet's total nihilism, whether as a threat, as a beginning or an end, or both at the same time. Infinity is usually identified with inde-

5. Quoted in Newman 1956

terminacy and immensity, both terms not infrequently being clothed in metaphysical attributes. Very often, in fact, they appear together as two sides of the same coin. As Anaximander characteristically stated, "The quintessence of Knowledge lies in the revelation of the oppositions in which the World was born... All opposites are similar. Chaos and Harmony, Life and Death, Zero and Infinity, form the two sides of the same coin".

We will begin our quest for these two concepts in the corpus of Modern Greek poetry with the leading poet Odysseus Elytis.

Zero, here representing the threat that will "eat up" the number one and eliminate it, appears in his work *Three Poems under a Flag of Convenience*:

> my unfortunate all alone one
> what' to become of you
> five or six zeroes on the side will eat you up
> and "it is finished" (C.P. 2004, 387; Elytis 1982, 32).

However, in the following verses from the *Axion Esti*, Elytis sings the praises of zero and identifies it with the beginning of the world. On almost the first page he refers to the:

> zero point where a bird is
> fragrant again from the beginning (C.P. 2004,124; Elytis 1968, 14)

and he ends this monumental work with the words:

> Now Now the zero
> and for Ever the world the small the great (C.P. 2004, 190; Elytis 1968, 32)

Now let us see how the poet converses with the concept of infinity.

The poem *Seven days on eternity* finishes when the poet "has already recited the words that demagnetize the infinity" (C.P. 2004, 204; Elytis 1990 (2), 25). Here the Word (Λόγος) devaticinates infinity. If infinity is considered to be the enclosed space of another essence and another voyage, the Word is the means of travel and the way of interpreting that space. Here the poet makes the Word, language, pervade the space of infinity and filter it from irrational into rational essence.

The poet, elsewhere expresses the awe he feels - and he is not the only one - at the concept of infinity, in the words "the infinite exists for us as the tongue for the deaf-mute" (C.P. 2004, 334; Elytis 1980, 24). Infinity is conceived again in the context of an analogy with language. Infinity is the Word, but people are unable to grasp this easily because they are mentally deaf and dumb before this concept. However, infinity exists

nonetheless, in the sense that language also exists regardless of the fact that one might not be able to hear or understand it.

In the following verses from the poem *Anniversary*, as things often take shape in poetry, infinity seems to acquire shape, form and foundations, becoming itself the form of the world.

> The nets of doubt draw in
> A form of salt
> Indifferent white
> Hewn with effort
> Which turns towards the sea the voids of its eyes
> And supports infinity (C.P. 2004, 19; Elytis 1987, 48)

And through the word "void", we have the meeting of infinity with zero.

In a fragment from the *Concert of Hyakinths* the poet will ask:

> So, where are you when the southwind dries up the soul and the Pleiades signal the night to free the infinite, where are you. (C.P. 2004, 49; Elytis 1987, 119).

The figure we met in the previous poem becomes a verbal figure here. Night forms the conditions of infinity in such a way as to make it more easily revealed to humanity. It is called upon, no longer in words but by gesture, in another language, to reveal infinity, here identified with the beloved. So we have a meeting of infinity and love, the world-creating power that holds the cosmos together.

We will continue with another great modern Greek poet, Kostas Kariotakis. He lived and wrote between the two wars, a period when a wider spirit of nihilism pervaded Europe.

> We must reconcile ourselves
> To Zero and Infinity (Kariotakis, 1986, 62) [6]

Kariotakis used these verses as the motto of his poetry collection *Elegy and Satires* (1927).[7] As early as 1923, he intended to publish the collection without a title, with a skull and crossbones on the cover and this phrase underneath. He drew a sketch of a

6. G. Savvidis (in the Nefeli Editions publication of the *Complete Works*) notes: "The fifteen-syllable couplet may have its literary origins in Dimitrios Paparrigopoulos:
O Eros, child of sky and melancholy.
O sphinx, presenting a double riddling mask
Infinity and nought, the tomb and life… ".

7. *Elegy and Satires* is Kariotakis's last collection, containing some of his best-known and most powerful poems.

skull which is inscribed inside a zero and the bones are superimposed on the algebraic symbol of infinity.

Here zero and infinity are two clearly separate symbols; however, they are simultaneously interconnected. The verb "to be reconciled", "συμφιλιώνομαι", certainly refers to Empedoclean "φιλότητα", "friendship". Thus, the poet is urging us to overcome "νείκος", "strife", and let our human person reconcile itself to the non-person, i.e. zero and infinity.

In another poem from the same collection he tells us:

> Begone, my heart longs for infinite serenity!
> And your breath agitates the black waters of the Styx,
> Which carry me, a shipwrecked mariner,
> To absolute Zero, to Infinitude. (Karyotakis 1986, 69)

Poetry here becomes nostalgia for the eternal return, the poet's longing for infinity and zero, identified with serenity and infinitude respectively.

And elsewhere,

> Fair voyage, my ship so far away, into the arms
> Of infinity and Night, with your golden lights!
> If only I were on your prow, gazing around
> At the first dreams passing in procession by (Kartyotakis 1986, 65)

A less-known female poet by the pseudonym Vennis Mak used the same verb as Karyotakis, "to be reconciled", to denote the tragedy of accepting nothing, when the soul longs for everything:

"I reconcile myself to zero while desiring infinity", thereby giving zero a clearly negative nuance and infinity a positive one.

> Dangerous poems
> You know it, they pull you
> Into infinity
> Chaos
> Zero (Kalfa 2012)

With these words, the poet Vayia Kalfa states that the peril of poetry is none other than the peril of zero and infinity, identified here with the concept of chaos, i.e. absolute nothingness.

The Transformations of Zero. This is the title which the poet Yannis Yfantis has given to a whole work. The influence of eastern religion and philosophy is immediately obvious from the poem *Definition.*

> Here I am where Zero bites its tail
> with pleasure
> and pain

here I am in the midst of eternity
at its beginning and its end (Yfantis 1989, 15)

Here Zero takes the shape of the oriental serpent Ouroboros that bites its own tail and is identified with pure pleasure.

In the following verses we have a multiform Zero, which will enter a place of magic and take the form of a conjuration against it.

All to do with zero is a spell. Wear Zero as a ring and conjure Maya away. (Yfantis 1989, 15).

Elsewhere, Yfantis gives infinity the form of air, meaning spirit, a breath[8] that fills the sail of the sky rather than the earth.

Infinity blows, the sail of the sky fills... (Yfantis 1989, 78).

Infinity seems to be a component of the sky, something found there up high, not within our earthly borders.

In *The Numbers*, another poem from the same collection, Yfantis refers to 8 as

Complex of Zero that breaks
and becomes 9.
It curls up to stand next to 1, as far as infinity
where speaking
Proteus Number reveals... (Yfantis 1989, 129).

Here we are reminded of Elytis, since once again the Word (Λόγος), through the verb "reveals" (αποκαλύπτω), meets infinity and both together become numbers.

Now, we will move on to Tassos Leivaditis, who refers to infinity as an extensible surface which is crossed.

Rubbish - time was made to flow,
loves to end,
life to go to the devil
and I to cross Infinity with the great stride
of a mathematical calculation... (Leivaditis 1966 vol. I, 348)

The human figure is now presented as a traveler of infinity, who, aided once more by the Word (Λόγος) (Elytis), this time in the form of mathematics, manages to cross infinity.

8. The Presocratic philosopher Xenophanis identified air with breath.

The concepts of zero and infinity have even passed onto people's lips through song lyrics.

Saturday night with sugared drinks
The wind brings loves and takes them away
You were pretty as a weeping picture
Zero and infinity one in your two eyes.

This is an extract from a wonderful song with lyrics by Alkis Alkeos. Here zero and infinity are the related essences that are joined. The way and place in which they do so are the eyes rather than the lips, in a transition from Word (*Λόγος*) to feeling. The poet sees infinity in the eyes of the beloved, penetrates infinity and sees the cosmos, identifying these two concepts with love.

Here is another extract from a well-loved song, with lyrics by Lina Nikolakopoulou.

I wake at midnight
and open the window
and what I do
who told you it's a weakness
when I reckon
my zero against infinity
and find the world
disabled in places

Logos, the Word, appears once more in the verb "λογαριάζω", "to reckon", only this time we see human disability reflected in infinity, and so we move from the infinite to the finite.

In the *Bars of Thessaloniki*, Manolis Xexakis writes:

Summer 1985
merchants carry hods and build with lies everywhere,
a ship carries zeroes around the Thermaic Gulf (Xexakis 1987, 34)

Zero appears in an image of the sea, referring to infinity on the one hand and sailing on the other.

And the poet Thanassis Tsakiridis tells us:

Zero Nothing and I
Are those that give me life (Tsakiridis 1989, 136)

The phenomenon of life, here, seems to spring from zero and nothing and meet the person.

We will end our tour of Modern Greek poetry with a poem by Dimitris Perodaskalakis, called *Lesson*.

The word “infinity” written on the blackboard
next to Jesus gazing at us from the icon

A little higher on the wall the blue
white paper with large letters in Ancient Greek
that the children are trying to learn:

Τις αγορεύειν βούλεται?
Who wishes to speak?

It’s not easy
with “Infinity” and “God” as an audience
how can you speak?

And anyway,
Ξυνός ο λόγος, the word is common, how can you speak it? (Perodaskalakis 2012)

In the first verse we have the blank board, originally a tabula rasa, on which is now written, inscribed, printed the material of infinity. And below, the lesson of Ancient Greek, the primordial womb, with us as the students of infinity. *Who wishes to speak?* Who will address infinity? So infinity is a great agora, in the sense that everything coheres, i.e. the cosmos itself.

Then, there is “Infinity” and “God”. Two beings, simultaneously united and divergent, which are listening. So infinity is connected to sound, it is itself the primordial universal sound, a huge ear, a cavity that listens and is heard. And finally, infinity is the audience of a Heraclitan *ξυνός λόγος* - in Modern Greek the “common word” - that is spoken by man and concerns us all. Infinity, common to all.

Zero and infinity are not only found in verse. They are often used as titles of poems or even whole collections of poetry. As we have said, Yannis Yfantis named an entire work *The Transformations of Zero*. Vaggelis Philos called two of his poems *Null Sequence* and *Zero and Infinity, It’s Raining Again*, Dimitris Makoussis has *Zero 0 Distance* and Sotiris Gounelas uses the title *The Rubber Zero.*

Conclusions

Zero and infinity, charged and catalytic concepts, have dominated our lives since the beginning of the world, in any shape, form, name or symbolism. So they could not but appear in poetry. We have attempted, as far as possible, to track these concepts through the Modern Greek poetry corpus. Time does not permit us to exhaust the subject, and in any case we can certainly not argue for the result of our efforts, for, as the poet says, “arguments by right only spring has at its disposal”. (C.P. 2004,425; Elytis 1986, 19).

References

Boukalas, Pantelis, 2000. *Σήματα Λυγρα* [Simata Ligra]. Athens: Agra

Elytis, Odysseas. 1968. *Το Άξιον Εστί* [*The Axion Esti*]. Athens: Ikaros Editions.

Elytis, Odysseas. 1980. *Μαρία Νεφέλη* [*Maria Nephele*]. Athens: Ikaros Editions.

Elytis, Odysseas. 1982. *Τρία ποιήματα με σημαία ευκαιρίας* [*Three Poems under a Flag of Convenience*]. Athens: Ikaros Editions.

Elytis, Odysseas. 1984. *Ημερολόγιο ενός αθέατου Απριλίου* [*Journal of an Unseen April*]. Athens: Ypsilon Editions.

Elytis, Odysseas. 1987. *Προσανατολισμοί* [*Orientations*]. Athens: Ikaros Editions.

Elytis, Odysseas. 1990. *Έξι και μία τύψεις για τον ουρανό* [*Six and One Remorses for the Sky*]. Athens: Ikaros Editions.

Hardy, Godfrey. H. 1993. *Η Απολογία ενός Μαθηματικού* [*A Mathematician's Apology*]. Translated by Michalis Lambrou, Dimitris Karagiannakis. Heraklion Crete: Crete University Press.

Kalfa, Bayia. 2012. *Ανθολογία θανάτου* [*Anthology of death*] . Athens: Gavriilidis Editions.

Kariotakis, Kostas. 1986. *Ποιήματα και πεζά* [*Poems and poses*]. Athens: Ermis Editions.

Livaditis, Tasos. 1993. *25η ραψωδία της Οδύσσειας* τρεις τόμοι [*25th rhapsody of Odyssey,* three volumes]. Athens: Kedros Editions.

Newman, James, 1956, *The World of Mathematics* , New York: Simon & Schuster.

Xexakis, Manolis. 1987. *Κάτοπτρα μελαγχολικού λόγου* [*Mirrors of a melancholy word*]. Thessaloniki: Barbounakis Editions.

Perodaskalakis, Dimitris. 2012. *Επί γαν μέλαιναν* [*On black earth*]. Athens: Gavriilidis Editions.

Tabucchi, Antonio. 2004. *Tristano Dies, a life.* Translated from the Italian by Elizabeth Harris. Brooklyn, NY: Archipelago Books.

Tsakiridis, Thanasis. 1989. *Ποιήματα* [*Poems*]. Athens: Exandas Editions.

Yfantis, Giannis. 1989. *Οι μεταμορφώσεις του Μηδενός* [*The transformations of zero*]. Athens: Erato Editions.

The Collected Poems of Odysseus Elytis (C.P.). 2004. Translated by Jeffrey Carson and Nikos Sarris. Baltimore and London: The John Hopkins University Press.

Prose

THE AFFECTIVE NARRATIVE OF THE LUNAR DISTANCE. SCIENCE AND LITERATURE IN THE *COSMICOMICS* BY ITALO CALVINO

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I. The author: Italo Calvino

The Italian journalist and writer Italo Calvino was born in Santiago de las Vegas, near Havana, Cuba on October 15th, 1923; he died in Siena on September 19th, 1985. In 1941 he began studying Agriculture at the University of Turin, and, since 1943, at the University of Florence; however, in 1944 he abandoned his studies for joining the Resistance against the National-socialist German occupants and their Italian fascist collaborators under the combatant name Santiago, his birth place (Baranelli, Ferrero [1995] 2013, 23). During the years 1945-1947 he studied Literature in Turin. After his studies, he worked at the Einaudi publishing house, as well as a journalist and essayist for the Communist newspaper *L'Unità*, the Communist political magazine *Rinascita* and other journals; he cancelled his membership at the Communist Party of Italy on August 1st, 1957 (Baranelli, Ferrero [1995] 2013, 79-163). After a first writing period with short stories and novels marked by neorealism (a style that justified Calvino's early image as *scritore impegnato* –socially and politically engaged writer) he wrote fantasy or allegorical novels (*Il visconte dimezzato – The Cloven Viscount*, 1952), before the *periodo combinatorio* which begins in the 1960s and focuses on narratives with "an infinite potential of possible combinations and meanings" (Pilz 2005, 22-23). Indeed, the transition in the new decade marks a turning point in Calvino's writing. As M. Bucciantini puts it: "I conti con la storia sono terminati. Il progetto letteratura-società si è chiuso definitivamente…" (Bucciantini 2006, 15). With *Le Cosmicomiche* (*Cosmicomics*) in 1964-65 Calvino begins a "progetto per una letteratura cosmica" (Bucciantini 2006, 16) towards forms that enable categorisations of his work between avant-garde and postmodernism (Pilz 2005, 4 ff.).

II. Calvino and science

Several authors have treated the relationship between Calvino's novels and science (e.g. Bucciantini 2006; Hume 1982; Pilz 2005). They generally intersect Calvino's biography

and Calvino's numerous statements on his works and his critics with the background of literary production and scientific discourses of the period looking for possible cross-influences. The present study takes into account such relations; its goal, however, is to showcase narrative patterns and paths which materialise theoretical scientific concepts transforming them into literary narrative structures.

The historical epistemological context of Calvino's writing during the *periodo combinatorio* was marked, among others, by C. P. Snow's *The Two Cultures and the Scientific Revolution* (1959) focusing on the distinction between the narratives of science and those of humanities, Thomas Kuhn's *The Structure of Scientific Revolutions* (1962) focusing on the difference between the lot of "normal science" and the exceptional character of paradigmatic changes (ruptures) in scientific models, Prigogine's and Stengers' publications on chaos, complexity, and unpredictable deviations, as well as Jacques Monod's *Le hasard et la nécessité* (*The chance and the necessity*, 1970) focusing on the arbitrary and unpredictable (biological or physical) chance events. The dominant epistemological discourses of that period depicted all-embracing scientific paradigms (seen as "large narratives") in crisis. Instead, the scientific discourses seemed to be characterized by a structural fragmentation of theories and narratives (Pilz 2005).

The literary context was marked by international networks of experimental writing, such as the *OuLiPo* (*Ouvroir de Littérature Potentielle*). *OuLiPo* authors such as Georges Perec and the mathematician Raymond Queneau made a strong impression on Calvino. Italo Calvino became member of the *OuLiPo* in Paris in 1972 (Baranelli, Ferrero [1995] 2013, 204-226). What is important for the *OuLiPo* context – beyond Calvino's translations of poem collections of R. Queneau (e.g. *Les fleurs bleues*) – is the importance accorded by the *oulipiens* to literature as an interdisciplinary discourse, as well as the experimental forms of interaction between literature and scientific discourses exercised by several *OuLiPo* authors. Modern scientific issues were regarded as inspiration and guiding suggestions for expanding literary choices and narrative schemes. Calvino himself used such issues explicitly as starting narratives in his *Cosmicomiche/Cosmicomics*. Readers and critics often regarded Calvino's *Cosmicomiche/Cosmicomics* as science fiction (*fantascientifico*) – a popular literary *genre* in the 1960s. Calvino himself rejected such characterizations – even proposals naming his prose "reverse science fiction" (*fantascientifico alla rovescia*) in the sense of being directed towards the past and not towards the future: "*Nella moda dell fantascienza [...] Calvino ha inserito un fantapassato*". Calvino claimed that, instead of making the remote appear close to everyday life (as science fiction does), his own aim was to describe "*anche il quotidiano nei termini più lontani dalla nostra esperienza*" (Bucciantini 2006, 23 ff.). In the following example of *The distance of the Moon*, the first of the *Cosmicomics*, the relationship and the forms of interaction between scientific vocabulary (scientific discourse) and literary narratives of everyday experience will be examined form the perspective of the reader following an approach of perception aesthetics.

III. *Le Cosmicomiche / Cosmicomics*

Le Cosmicomiche (*Cosmicomics*) is a collection of twelve short humorous stories by Italo Calvino which have appeared in various editions. The stories were originally published between 1964 and 1965 in the Italian periodicals *Il Caffè* and *Il Giorno*; in 1965 they were published in one volume by Einaudi. The first English translation by William Weaver was published in the U.S.A. in 1968; in 1969 it won the National Book Award in the Translation category. Further stories were published under the titles *Ti con zero* (1967) and *La memoria del mondo e altre storie cosmicomiche* (1968). A new compilation was published in 1984 (*Cosmicomiche vecchie e nuove*). The later Italian edition by Mondadori under the title *Tutte le cosmicomiche* (1997) appeared in English under the title *The Complete Cosmicomics* first in 2002, and later in 2014 with an introduction by one of the translators, Martin McLaughlin (Calvino 2014, ii-xxiv). In the present work the Italian quotations refer to the 1988 edition by Garzanti (Calvino 1988) and the English ones to *The Complete Cosmicomics* in the 2014 edition (Calvino 2014).[1]

The *Cosmicomics* (1964-65) are generally regarded by the analysts as a creative project inaugurating two decades of Calvino's experimental writing with inspirations from modern scientific hypotheses (e.g. Pilz 2005, 24). Each story takes a scientific "fact" or hypothesis as generic starting point (though sometimes a falsehood by today's understanding), and builds an imaginative story around it. The resulting rational albeit fictional narrative has a cosmological background, and follows possible narrative paths along scientific issues with logically plausible consequences that may appear as events obeying a physical necessity. An always extant being called Qfwfq narrates all of the stories save two, each of which is a memory of an event in the history of the universe embedded in an everyday narrative. Qfwfq also narrates some stories in Calvino's Ti con *zero*. These narratives are created by letting Qfwfq move easily between different scientific theories and through different time zones (Pilz 2005, 32).

The starting scientific hypothesis is generally followed by further fragments of scientific discourses with no claim of global scientific consistency throughout the story. The first collection of stories (1965) included the following titles with the corresponding starting scientific hypotheses ("facts"):

- *The Distance of the Moon* (Calvino 1988, 7-23; Calvino 2014, 3-19): In the past the Moon used to be much closer to the Earth; the planet was gradually pushed away from the Earth under the influence of the tides (hypothesis attributed to Sir George H. Darwin).

- *At Daybreak* (Calvino 1988, 25-37; Calvino 2014, 20-31): The story turns around the process of solidification of the planetary system according to an explanation attributed to G. P. Kuiper. It can be regarded as a narration of life before the condensation of matter (!).

1. For the history of the editions, see Calvino 2014, vii-ix.

- *A Sign in Space* (Calvino 1988, 39-50; Calvino 2014, 32-42): The concept of a slowly revolving galaxy yields the frame of a story about a living being that is desperate to leave behind it some unique sign.
- *All at One Point* (Calvino 1988, 51-57; Calvino 2014, 43-48): The theory of assessing the velocity of moving galaxies according to Edwin P. Hubble is used in order to calculate the time elapsed after the big bang (15 – 20 milliards of years) at a point out of space.
- *Without Colours* (Calvino 1988, 59-71; Calvino 2014, 49-60): A story based on the hypothesis, that before there was an atmosphere on Earth, everything was (colourless) grey.
- *Games without End* (Calvino 1988, 73-81; Calvino 2014, 61-68): The starting cosmological hypothesis claims that new galaxies are permanently created *ex nihilo* to compensate for the permanent centrifugal movement of the older galaxies. Thus, the enlarging universe is the product of an endless game of permanent creation.
- *The Aquatic Uncle* (Calvino 1988, 83-96; Calvino 2014, 69-82): At a certain stage in evolution maritime animals left the sea and came to live on land – however, not all at the same time.
- *How Much Shall We Bet* (Calvino 1988, 97-108; Calvino 2014, 83-92): A story about betting on the long-term evolution of humankind on the background of cybernetics that describe any evolutionary process as being determined by positive or negative feedback loops.
- *The Dinosaurs* (Calvino 1988, 110-127; Calvino 2014, 93-111): The story departs from the hypothesis that the extinction of the dinosaurs who dominated Earth for 150 millions of years was due to their inability to adapt themselves to the climatic and environmental changes, and focuses onto the feeling of being the last one of them.
- *The Form of Space* (Calvino 1988, 129-141; Calvino 2014, 112-122): The story traces the consequences when the gravitation fields and the curved space enter into the experience field of the (unnamed) narrator.
- *The Light-Years* (Calvino 1988, 143-158; Calvino 2014, 123-136): The starting hypothesis regards the movement of galaxies and quasars. For the galaxies it is assumed that the velocity with which they move away from an observer (the unnamed narrator of the story who is looking at other galaxies) increases with increasing distance from that observer. The quasi-stars (quasars) are moving away with a velocity that approximates the velocity of light.
- *The Spiral* (Calvino 1988, 159-174; Calvino 2014, 137-151): The story regards the individuality and the form perception of the mollusks from the perspective of a mollusk. The scientific hypothesis is that the visible organic form of the mollusks is of no importance for the life of the members of a mollusk society since the mollusks can't perceive each other.

IV. *The distance of the Moon / La Distanza della Luna*: The narrative of the short and the augmenting distance.

The first story of the *Cosmicomics* (*Le Cosmicomiche*) involves five main figures: Qfwfq (who functions as narrator), his deaf cousin, captain Vhd Vhd, his wife (*signora* Vhd Vhd), and the young female Xlthlx. All figures (including further unnamed ones) are described with anthropomorphic features.

The plot is set in time when the elliptical orbit of the Moon brought the planet very close to the Earth. Once a (lunar) month the distance between the Moon and the Earth became so small, that it was possible to jump from one planet to the other. The five main figures and many others with them would use a ladder to jump from a boat on the close Moon in order to collect Moon milk (ricotta). In his narration Qfqfq admits that he loved (and still loves) *signora* Vhd Vhd, who loved the deaf cousin – whereas the latter was only interested in the Moon. *Signora* Vhd Vhd is therefore jealous of the Moon, and Qfqfq is jealous of his cousin. It becomes evident that Qfqfq as observer can't follow the role of describing "objectively" from a distance in the sense of a neutral perception since he is an active part of the world in the story and participates affectively in the various episodes (Hume 1982, 56).

V. Physical concepts become narrative patterns...

The physical background of the story is the relationship between the distance between the Earth and the Moon and the tidal phenomena. Because this distance at the beginning of the setting of the story was very small, its effect on the tides was much stronger – and precisely that was the chance for the Moon climbers:

> "The tides, when the Moon swung closer, rose so high that nobody could hold them back. There were nights when the Moon was full and very, very low, and the tide was so high that the Moon missed a ducking in the sea by a hair's-breadth; well, let's say a few yards anyway. Climb up on the Moon? Of course we did. All you had to do was row out to it in a boat and, when you were underneath it, prop a ladder against her and scramble up." (Calvino 1988, 9-10; Calvino 2014, 3-4)

The physics of the gravitation forces engender miraculous descriptions involving several objects and dead maritime animals and fishes suspending between the Earth and the Moon:

> Thin as she [little Xlthlx] was, she was an ounce or two short of the weight necessary for the Earth's gravity to overcome the Moon's attraction and bring her back: so she flew up among the medusas, suspended over the sea. (Calvino 1988,14; Calvino 2014, 8)

Precisely these descriptions are interwoven in their turn with the background of the physical laws creating plausible concepts of coping with these laws – or even of overcoming or circumventing them:

> She [little Xlthlx] took fright, cried, then laughed and started playing, catching shellfish and minnows as they flew, sticking some into her mouth and chewing them. [...] but all the while she kept wriggling and kicking at the air, as if she wanted to fight that influence, and her socks – she had lost her shoes in the fight – slipped off her feet and swayed, attracted by the Earth's force. [...] The idea of eating the little animals in the air had been a good one; the more weight Xlthlx gained, the more she sank toward the Earth; (Calvino 1988, 14; Calvino 2014, 9)

Such descriptions have been seen as metaphors in a network of archaic myths (e.g. Deidier 2004, 85). In our approach they represent trails, in which the narrative is derived from the consequent rational albeit playful reasoning on the normativity of the physical laws. Through this performance, the same narrative engenders itself new relationships and proposes narrative solutions of the physical problem – a situation that in the case of the suspended little Xlthlx is of existential importance, since she can't free herself otherwise from the attraction of the Moon.

VI....that restructure actions and relations

The turning point of the story is the moment when some of the figures realize during the Moon-climbing action that the distance of the Moon begins to increase. Actually the dreadful perception regards not the elliptic movement with the varying distance of the Moon from the Earth, but the widening of the orbit of the movement itself as described by Sir George H. Darwin in the moto of the story:

> But had he known from the beginning that the Moon's orbit was widening? None of us could have suspected it. The Deaf One perhaps, but only he. [...] And from their mouths and ours, at the same moment, came a cry: 'The Moon's going away!' (Calvino 1988, 17-18/2014, 12-13)

The climbing action has to be interrupted. All the figures involved return to the boats on the Earth – except *signora* Vhd Vhd. It is Qfwfq, the narrator and *signora*'s admirer, who notices it, and it is himself who tries the most to help her to find the way back to the Earth – back to him who desires her. It is remarkable how the scientific vocabulary with its exactness enters into the sphere of the literary narrative in a subversive way opening an unexpected horizon of empathy. Qfwfq shouts: "Uniamoci!/Hold tight to me! (Calvino 1988, 19/2014, 14.) Literally this means: "Let us unite with each other!" like two spatial bodies, or, more empathically, like two human beings who desire each other.

The salvation operation is a remarkable evidence of scientific terminology being dressed in an empathic narrative and transformed in the affectionate image of the "weightless condition" of *signora* Vhd Vhd. Qfwfq describes the scene as:

> I was so absorbed I didn't realize at first that I was, indeed, tearing her from her weightless condition, but was making her fall back on the Moon. Calvino 1988, 19/2014, 14.)

Is it the action itself, or this affectionate description that disturbs the physical equilibrium? Eventually *signora* Vhd Vhd falls back on the Moon – her admirer, the narrator Qfwfq, follows her hoping to spend the next (lunar) month on the Moon "on her" – an expression that can be understood literally (scientifically) as "on the Moon", according to the vocabulary of desire, however, as "on *signora* Vhd Vhd". What follows is a change of perspective from the terrestrial empathy of desire to a cool technical perspective from an observation point in the space. The short report by Qfwfq from the Moon undertakes the popular scientific discourses of the early 1960s expecting the viewing of the Earth from the perspective of the Moon:

> … in nostro sguardo si levava lassù al mondo dov'eravamo nati, finalmente percorso in tutta la sua multiforme estensione, esplorato in paesaggi mai visti da nessun terrestre, […] e invece e invece e invece era l'esilio, /… we raised our eyes up, up to the world where we had been born, finally traversed in all its various expanse, explored landscapes no Earth-being had ever seen, […] and yet, and yet, it was, instead, exile.) (Calvino 1988, 20/2014, 15)

It should be remarked that the view of the Earth from the Moon, an old literary *topos*, was revived in the 1960s by President J. F. Kennedy's announcing on 25 May 1961 that "this Nation [the USA] should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth". The first satellites were on orbit since 4 October 1957, when the Soviet Union sent successfully the first Sputnik around the Earth. Pictures of the Earth taken from the space existed already since the late 1940s; however, Yuri Gagarin's view on the Earth in 1961 gave a decisive symbolic human touch to this perspective. All these elements formed the cultural frame in which Calvino's story came to be. The iconic picture of the Earth as the blue planet viewed from the space, however, became a ubiquitous, universally recognisable element of popular culture *after* the publishing of the *Cosmicomics*. The source was the Apollo 8 mission; the famous photograph was allegedly shot on 24 December 1969, seven months before the first astronaut landing and walking on the Moon (20 July 1969).

The remarkable experience of the narrator Qfwfq is that without the earthy soil below his feet his love has lost its objective and has become a pure nostalgia – which can be confused with the nostalgia to return to the Earth. Eventually this opportunity is given after the (lunar) month spent on the Moon. At this point a narrative smelting of

the discourse of desire with the scientific discourse regarding actions in the space takes place with the focus directed on the person of the deaf cousin. In his last performance on the Moon which was driving away

> … he [the deaf cousin] was unable to conceive desires that went against the Moon's nature, the Moon's course and destiny, and if the Moon now tended to go away from him, then he would take delight in this separation just as, till now, he had delighted in the Moon's nearness. (Calvino 1988, 22/2014, 17)

Indeed, we have a fusion of the science fiction narrative of the "condizione lunare/ lunar state" and the psychoanalytical discourse of the 1960s in the assimilation of the deaf cousin with the object of his desire, this extrahuman love – the Moon.

The narrator himself springs through a "rarefied space/spazio rarefatto" of scientific expressions functioning as narrative metaphors (Calvino 1988, 23/2014, 18) and returns to the Earth, in an act that makes him forget the reason he was on the Moon (i.e. his desire for *signora* Vhd Vhd), or rather that makes him become aware of the unfortunate character of that remote reason. *Signora* Vhd Vhd, however, remains on the Moon – and re-constitutes in the sentence closing the story the remote object of the narrator's desire:

> … come anche ora che la luna è diventata quel cerchietto piatto e lontano, sempre con lo sguardo vado cercando lei […] e che ogni plenilunio spinge i cani tutta la notte a urlare e io con loro. /… just as now, when the Moon has become that flat, remote circle, I still look for her […] and, whenever she is full, sets the dogs to howling all night long, and me with them. (Calvino 1988, 23/2014, 18-19)

VII. Conclusions

An ambitious claim of the *oulipiens* in general and of Calvino in particular regards the alleged potential of literary texts to simulate reproduction of knowledge as if they were themselves sources of knowledge. This claim touches not only the relationship between scientific discourse and literature, but also between epistemology and literary criticism as spaces in which the claim should be analysed and its validity could be checked – such an analysis, however, lies methodologically beyond the scope of the present study. What could be shown above in the case of Calvino's story *The Distance of the Moon* is the validity of the claim that affective narrative and rational choices of the narrative path do not exclude each other. Moreover, the narrative motives of affective triangular relations, lunar obsession, or playful acrobatic excursions to the Moon (beyond the claims of their metaphoric functioning) follow conventional scientific argumentative paths that, alienated from the context in which they claim validity, engender themselves narrative patterns along the scientifically "induced" consequences of the story – consequences

that follow conventional scientific patterns etc. etc. – thus creating a perpetual movement on a Moebius tape.

In this sense the *Cosmicomic* visions enact a multiplicity of possible theories (or fragments of theories) available in science relating them with the imaginative purposes of literary narratives. Extrapolating the predictions or retrospections of these visions in time and space becomes a literary game in which scientific hypotheses are not only re-interpreted, extrapolated or exaggerated (e.g. the theory of G. Darwin refers to an increase of the distance between Moon and Earth of some cm/year), but are also used as structuring principles of new narratives that generate further scientific hypotheses or yield fictive, albeit plausible, scientific-sounding explanations of literary *topoi* or (apparently) physical observations, such as the dogs' howling at full moon.

References

Baranelli, Luca & Ferrero, Ernesto. 2013 (1995). *Album Calvino*. Milano / Fischer, Frankfurt/M. : Mondadori.

Bucciantini, Massimo. 2006. *Italo Calvino e la scienza: Gli alfabeti del mondo*. Roma: Donzelli.

Calvino, Italo. 1988. *Le cosmicomiche*. Milano: Garzanti.

Calvino, Italo. 2014 (2009, 2020). The Complete Cosmicomics. Translated by Martin McLaughlin, Tim Parks, and William Weaver. Boston/New York: Houghton Mifflin Harcourt.

Deidier, Roberto. 2004. *Le forme del tempo: Miti, fiabe, immagini di Italo Calvino*. Palermo: Sellerio.

Hume, Kathryn. 1982. "Science and Imagination in Calvino's *Cosmicomics*." *Mosaic* XV.4, 47-58.

Pilz, Kerstin. 2005. *Mapping complexity: Literature and Science in the works of Italo Calvino*. Leicester: Troubador.

HIDDEN PATHS – UNCONVENTIONAL PRACTICES. A HER-STORY OF CIRCULATION OF MEDICAL KNOWLEDGE IN THE LATE TWENTIETH CENTURY

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Introduction[1]

Science and Literature as a discipline refers to the complex relationship between two different fields of knowledge that yet intersect in terms of methodology, culture and objects. As Vlahakis, Skordoulis and Tampakis (2013) argue, there are no clear-cut boundaries between them but instead they operate as "borderlands."

To that end, the examination of the relationship between science and literature aims to provide a better understanding for both, by focusing on the ways that the former affects the later and vice versa. Thus, if we try to narrow down schematically the scope of this fruitful field, we can reveal some main research questions: how literary and rhetoric interaction shapes scientific practice? Which are the scientific schemes that can be found in literary works? How science fiction became a tool of science education? How can we understand science through public imagination? How literature operated as a way of participating in science? What can we learn if we approach scientific texts as literary works and vis versa? Which are the common characteristics of both endeavors? At the same time, as Flohr (2004) argues, the study of the relationship between science and literature can be better understood under the assumption that both of them are interrelated with the general cultural discourse in two different ways: they shape our common culture and they are influenced by it (2004, 2).

Hence, science and literature can be seen as cultural activities that are historically and socially informed, while science, literature and culture can be approached as *spaces of transition* (Vlahakis et al. 2013) or *conceptual spaces*[2] (Broks 2006). Alternatively, we can map their connections and reveal their motions between different *realms of knowledge, social worlds* (McCormick et al. 2003) or in *human life* in general (Östling et al. 2018). As

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2. Broks refers to the notion of *conceptual space* with a parallel reference to the notion of *spatial imaginaries*. He argues that the combination of those to concepts operate as a "*model for understanding how the meanings of scientific knowledge are changed and negotiated*" (Broks 2006, 144).

spaces that interact, they do have overlapping areas with shared characteristics, but more importantly they create a network of circulation of knowledge or multiple channels of communication of scientific ideas. In that regard, the aim of this essay is to explore literary works as tools of science communication. What I want to emphasize on is that in an era where the flow of information is blocked, the development of literary works enabled the circulation of knowledge and allowed its invasion in the hegemonic public sphere. To that end, I will present two literary works in regard to contraception, produced by women for women during 1970s, aiming to share knowledge about women's health.

Before we continue with the presentation of the content of the aforementioned literary works, I will try to contextualize them in order to provide a deeper picture of their appearance in the Greek public sphere during the late 1970s.

Written in 1977 and 1979 under the titles *Methods of contraception* and *Clementine or the contraception*[3], the books are part of the history of Greek birth control movements that emerged directly after the fall of the Junta of the Colonels (1974) and ended twelve years later, when the abortion bill (Law 1609/1986) was filed in the parliament and women's right to control their pregnancy was officially recognized.

In Greece until 1986, despite the fact that abortions were banned, feminists argued that 300,000 illegal abortions took place every year, while gynecologists denied to provide information about contraception (Avdela et al. 1986, 9). In other words, abortion was a profitable market and used as a contraceptive method while, other contraceptive methods either were absent or they used only for medical purposes. Under these conditions, the emerge of feminist birth control movements was a (women's) way to take control of their bodies and reclaim knowledge. More specifically, it was a political movement that included autonomous feminist groups and women's organizations that aimed to secure women's sexual and reproductive rights.

As we have argued elsewhere (Chordaki, Lazopoulou, forthcoming), by including birth control movements in the field of history of science and reapproach it as a history of an alternative form of knowledge, we can understand how marginalized social groups produce and circulate scientific knowledge outside the boundaries of the academic sphere. Thus, as an inclusive science communication *her-story* reveals multiple practices, objects, social groups, spaces and places for the circulation of scientific ideas such as: magazines, brochures, posters, proclamations, exhibitions, demonstrations, translations, literary works, public events, private and public spaces. The literary works of this essay are part of this story, a story that aims to the circulation of scientific knowledge that was blocked and the parallel visibility of women's experiences that were marginalized.

3. These books were part of Dr Eftychia Leontidou's personal collection. I want to express my gratitude for her willingness to share with me her material, archives, experiences and stories that are valuable sources both for my dissertation and the current essay.

Clémentine ou la contraception[4]

Firstly, I will present the *Clementine or the contraception*, the Greek translation of the book originally titled *Clémentine ou la contraception.* The translation was published in Greek in 1979 by Stochasmos Publications (translated by Efi Papadopoulou and illustrated by Margarita Papadopoulou).[5] The original book was published in 1978 by Savelli in Paris and was written and illustrated by four high school girls: Natalie Crinon, Catherine Manes, Aurélie Memmi and Catherine Revault.

As the authors claim in the introduction, the book is an illustrated history of contraception for all women: "from virgins to women that experience menopause."[6] It is one of the first stories for women's sexuality and health, published in an era that such topics considered taboos both in schools and the wider society (BDMEDICALES, 2008).

The story is written in 1977 and the heroines embody experiences and needs of teenage girls in their effort to understand their bodies and sexual pleasure. However, what is particularly interesting is the fact that the narration is developed not only in the sphere of reality, but also in that of utopia. By this, I mean that, despite the fact that the content refers either to scientific knowledge or social conditions it describes how women lived during the 1970s and experienced social pressure and patriarchal ideology, while they create an alternative world that visions how women want to live. Indeed, in the introduction they write: "We created the character of Clementine not for us but for her, for her to live in a way that we want all women to be able to live. And if Clementine is alive, this is because of hundreds of women that fought to learn themselves, to learn the others, to talk, to struggle altogether for a different life."[7]

The narration starts with Clementine's forthcoming first intercourse and her thoughts about the pill. Her visit to the gynecologist (who is a friendly woman that provides responsibly all the necessary information) is the beginning of authors' effort to circulate knowledge. Thus, we meet a poster with illustrated female organ anatomy (clitoris, urethra, vagina, perineum, uterus, ovary, cervix, Fallopian tube), including names and functions that support the following presentation of the menstrual cycle. The doctor appears to provide a detailed explanation of the cycle by presenting hormones (FSH, LH, LTH), the involved organs and a diagram that shows the flow.

The transition from the organs to the menstrual cycle is creating the necessary background for the better understanding of how the pill works. The doctor explains different kinds of the pill, while at the same time, she provides information regarding the risks. By rejecting the dominant narrative of the correlation between the pill and

4. The content and the two quotations of the current essay in regard to the presentation of the book *Clémentine ou la contraception* is derived from the Greek translation.
5. The Greek title is *Κλημεντίνη ή τα αντισυλληπτικά.*
6. My translation.
7. My translation.

cancer – under any condition (a narrative supported by those who were against the use of the pill), she clears out that the pill is dangerous for cancer patients or it may be dangerous if there is a history of cancer (here she suggests that the tests should be run every 3 months). Accordingly, she presents diseases and conditions that increase the risk of the pill (fibroid, hepatitis, cardiac diseases, breastfeeding, thrombosis, thrombophlebitis etc.) and explains how they can overcome the risk and still use the pill. The medical information is accompanied by an eight-staged illustration where important practical questions are asked and answered: when should I take the pill, what do I do if I experience nausea, what if I forget one, two or three doses according to the type of the pill I use?

Beside the important information that is presented through the narration (information not usually available to most of the women) both the two girls and the doctor move away from the debate about the pill and focus on the importance of the constant communication with the doctor and the necessity of frequent tests. As the story shows, these issues were often neglected and created more psychological and physical problems than the pill itself. Thus, women had to learn which tests are necessary, what types of the pill exist, how they can establish a trustworthy relationship with the doctor and how a doctor should be. Thus, in our story the public image of the doctor is quite different than in reality: she is woman in an era where most gynecologists were men, she is friendly, she provides all the necessary information in a safe environment, she gives advices and suggestions instead of prohibitions and she respects the patient, her needs and experiences.

The narration continues with Clementine to self-examine her breasts according to the doctor's instructions. Breast self-examination is presented both by images and text and there is a description of tumors and cysts. Then, it follows a list of contraceptive methods other than the pill.

Thus, the book refers to Intrauterine Contraceptive Devices, Contraceptive Diaphragms, Spermicides, condoms and male contraception. What is particularly interesting is that the story includes all aspects of the necessary information: sizes, materials, usefulness and effectiveness, risks, complications and cost. At the same time, there is a detailed description of women's experiences: how do they feel when the doctor insert the devices, how women can check the position, which posture is more helpful, which are the difficulties and how important is to know your body in order to find the best position. Moreover, there is an extend presentation of male anatomy and the procedure of vasectomy. Followingly, Clementine discusses abortion and more specifically vacuum or suction aspiration. She provides information about the medical procedure, while at the same time, girls stress the importance of sharing knowledge in order to feel safe and avoid fear.

The last part of the book is a dictionary of medical terms and their meanings. It includes information about: ovarian follicles, corpus luteum, amenorrhea, follicle stim-

ulating hormone, lutermising hormone, cervical mucus, endometrium, spermicides, progesterone, estrogen, testosterone, Knaus – Ogino method (Calendar based contraceptive method), endometriosis, abortion and vaginitis.

To that end, we see how a fictional illustrated story circulates both medical and experiential knowledge among women in different countries. Images, diagrams, posters and text compose a full body of knowledge that women need and try to reclaim, in order to understand themselves, their bodies and their sexuality. Indeed, the book covers a wide spectrum of topics and combines scientific knowledge, medical devices, medical practice, women's experiences, social conditions, sexual pleasure, sexuality and homosexuality. Having in mind that the authors are neither doctors nor professional writters, the result creates a unique literary work and a resourceful historical archive for understanding how women communicated science in the late 20th century outside the academic sphere.

Methods of Contraception[8]

When *Clémentine ou la contraception* was written in Paris in 1977, another related book was published in the same year in Athens by the Multinational Women's Liberation Group[9] under the title *Methods of Contraception*[10]. The group, created in 1975, was the first autonomous feminist organization and included four subgroups that focused on labor, child care programs, ideology and information, and sexuality and contraception, while in 1978 they introduced their magazine *Women's Liberation* (Hellenic Parliament Foundation, 2017).[11]

Having realized that in Greece the state prohibits contraception and tolerates illegal abortions, the group organized in 1976 a fifteen-day public exhibition of contraceptive methods and wrote a related informational text that later lead to the book that is presented here. This updated edition – a collective work that looks like a textbook, combines feminism with OB/GYN, situates it within the political and historical context of Metapolitefsi and reflects women's need to access medical knowledge in order to liberate themselves and their sexuality.[12]

Hence, the first part of the book explains the deep history of women's oppression and the importance of Women's Liberation Movement, combining the past and the present

8. The content of the current essay regarding the presentation of the book *Methods of Contraception* is derived from the original book.
9. In Greek: Κίνηση για την Απελευθέρωση των Γυναικών.
10. My translation. The original title in Greek is *Αντισυλληπτικά Μέσα*.
11. My translation. The original title in Greek is *Για την Απελευθέρωση των Γυναικών*.
12. For a presentation of the Greek Metapolitefsi, see the introduction in Kassimeris, 2005.

in a political base. Then, follows the introduction where the problem of abortion in Greece is explained: it is an expensive and dangerous (while it is illegal) procedure that often is known as the only contraceptive method, women lack knowledge and doctors refuse to share information about the risks, while at the same time, contraception is disparaged by the medical community and the wider society because it is identified to women's sexual and social liberation.

By highlighting that their aim is to acquire knowledge instead of replacing gynecologists, the authors start with the presentation of the anatomy of male and female genital organs including images and text that help the reader to understand male and female bodies and sexual intercourse. Sexual intercourse is described both anatomically and as a relationship, while there is a reference to all kinds of sexual activities. Thus, even from the beginning the book creates a safe environment and deconstructs taboos around sex.

The narration continues with the presentation of contraceptive methods including the pill, diaphragm, vaginal contraceptives, vagina douche, Intrauterine Contraceptive Devices, calendar based contraceptive methods, withdrawal method, male pill, tubal ligation, sterilization by laparoscopy and vasectomy.

As we saw earlier, this book also provides detailed information in regards to the available types of the pill, how they work, what is their cost, how and when a woman should take it, for how long, what are the differences between alternative brands, which are the side effects (thrombosis, breast or cervical cancer), the advantages and disadvantages. Accordingly, there is a list of questions that the doctor should ask such as possible diseases, family diseases, headaches, phlebitis, pregnancy complications and menstrual cycle, and a list of the necessary exams and tests: gynecological and breast examination, Pap test, blood, urine and hormone tests. Moreover, the authors suggest when the exams should be repeated for the better supervision of a woman's health.

Additionally, in relation to the other contraceptive devices and methods, the book includes information about their usefulness, effectiveness, side effects, costs, medical examination, complications and risks and practical tips and warnings.

Moreover, besides the text and the images, we can also find specifically oriented tables, globally informed, with percentages of side effects in relation to age, statistics, number of pregnancies per year and per contraceptive method and how many medical visits and expenses are required for every contraceptive method.

The last part of the book is dedicated to abortion. Hence, the authors present a detailed description of four different types of abortion: vacuum or suction aspiration, dilation and curettage, instillation abortion and abortion with prostaglandins. They provide historical and statistical data and they emphasize on the medical procedures and complications such as pain, infections, death, hemorrhage, uterus perforation, endometritis, cervical insufficiency, and adhesion. Within the narration, they explain every term, while at the same time they focus on sharing information for the safety of every procedure. Furthermore, they spent many paragraphs for each type of abortion both for women's preparation before the surgery and the postoperative care and self-care.

Conclusion

As Lässig points out, it is important to acknowledge that every social group potentially can generate knowledge (2016, 43). Thus, by including gender, class or religion we can find rival forms of knowledge, in unexpected places, which is generated by marginalized groups (2016, 53) that were excluded from the hegemonic landscapes of production and circulation. Characteristically, she writes: "by focusing on knowledge we are able to see what was lost in history, what was suppressed as subversive or dismissed as irrelevant or deemed obsolete and thereafter forgotten" (2016, 45).

The aforementioned literary works reveal a political history of feminism in a peripheral country, but more importantly, uncover an inclusive and diverse science communication her-story. A her-story of gender biased exclusion of women from medical knowledge and their effort to reclaim their bodies, share their experiences, access scientific knowledge and demand feminist values in OB/GYN methods and practices.

To that end, the methodological intertwinement of history of science with history of knowledge urges us to look outside the traditional sources. Indeed, if we study how oppressed and marginalized groups communicated scientific knowledge, then we have to follow new paths of evidences, that as my case study showed, can transform a literary work into a resourceful primary historical archive. As such, they can be further studied as part of a greater channel of communication among, both national, international and transnational networks.

Because of women's social status, science communication was achieved through "unconventional" practices, where literature (and translation) as a form of expression, helped them overcome their exclusion and operated both as an *escape* and as a type of *connection*. It is worth mentioned that, on the one hand, the aforesaid literary works appeared in the same historical period in different countries and their circulation achieved through translation. On the other hand, the books reveal a network of communication between France, Greece and the United States, while they share a common reference – the emblematic book *Our bodies, Ourselves* by the Boston Women's Health Book Collective (1970). Thus, the flow and the content of knowledge, as well as the actors and the involved places – core issues in Science Communication Studies, can be mapped through these literary works.

References

Avdela, Efi, Papagiannaki, Marina & Sklaveniti, Kostoula. 1986. "Άμβλωση 1976-1986. Το χρονικό μιας διεκδίκησης." ["Abortion 1976-1986. Claim chronicles"]. Δίνη Φεμινιστικό Περιοδικό [Dini Feminist Magazine], 1: 8-29.

BDMEDICALES. 2008. "Clémentine ou la contraception." Accessed July 23, 2020. https://www.bdmedicales.com/albums/clementine-ou-la-contraception.htm

Boston Women's Health Collective. 1970. Our bodies, Ourselves. New England Free Press.

Broks, Peter. 2006. Understanding Popular Science. Open University Press.

Chordaki, Evangelia & Lazopoulou, Antigoni. Forthcoming. "Reclaiming our health: Greek feminist birth control movements as a form of women's engagement with science." Women in the History of Philosophy and Sciences. Springer International Publishing.

Flohr, Birgitt. 2004. "The relationship between literature and science in the nineteenth century. A discussion of an interdisciplinary approach." Conference Proceedings.

Hellenic Parliament Foundation. 2017. "Ο Φεμινισμός στα χρόνια της Μεταπολίτευσης, 1974-1990: ιδέες, συλλογικότητες, διεκδικήσεις". ["Feminism in Metapolitefsi, 1974-1990: ideas, collectives, claims"]. Exhibition in the Hellenic Parliament. Accessed July 23, 2020. http://foundation.parliament.gr/central.aspx?sId=111I462I1212I646I458515

Κίνηση για την Απελευθέρωση των Γυναικών [Multi National Women's Liberation Movement]. 1977. Αντισυλληπτικά Μέσα [Methods of Contraception].

Kassimeris, George. "Junta by another name? The 1974 Metapolitefsi and the Greek extra-parliamentary left." *Journal of Contemporary History* 40.4 (2005): 745-762.

Lässig, Simone. 2016. "The History of Knowledge and the Expansion of the Historical Research Agenda." Bulletin of the GHI Washington, Issue 59: 29-58.

McCormick, Sabrina, Brown, Phil & Zavestoski, Stephen. 2003. "The Personal Is Scientific, the Scientific Is Political: The Public Paradigm of the Environmental Breast Cancer Movement." Sociological Forum, 18(4): 545-576.

Natalie, Crinon, Catherine, Manes, Aurélie, Memmi & Catherine, Revault. 1979 (1978). Κλημεντίνη ή τα αντισυλληπτικά [Clementine or the Contraception]. Translated by Efi Papadopoulou. Athens: Stohasmos Publications.

Östling, Johan, Sandmo, Erling, Larsson Heidenblad, David, Nilsson Hammar, Anna & Nordberg, Kari. Eds. 2018. Circulation of Knowledge: Explorations in the History of Knowledge. Nordic Academic Press.

Vlahakis, George, Skordoulis, Kostas & Tampakis, Kostas. 2014. "Introduction: Science and Literature Special Issue." Science & Education 23: 521-526.

THE LEADING APPROACH TO THE SCIENTIFIC REVOLUTION THROUGH LITERATURE FORMS: REPORTS, DIALOGUES AND LETTERS WITHIN COPERNICUS', KEPLER'S AND GALILEO'S WORKS

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I.

It was late in October 1496 when the 23-years-old Nicolaus Copernicus (1473 - 1543), already student at the famous University of Cracow, left the plains of his fatherland in Poland and rushed to Bologna to continue his studies at famous Italian universities. There he met some intriguing scholars such as the famous astronomer Domenico Maria Novara (1454 - 1504), became acquainted with the modern ideas of that era and he experienced the center of the Renaissance within Italian cities. Copernicus adopted several modern and innovative ideas during his stay in Italy that influenced him to introduce the heliocentric view of the Cosmos, thus fundamentally changed the cosmic view as it had been described since ancient times.

The inspiration he received from the cosmopolitanism he experienced at the center of the Renaissance must be considered a major factor for the ideas he had and afterwards introduced, a true motivation for him to conceive revolutionary ideas concerning the Cosmos. The principles of surging neoplatonism which had arisen in cosmopolitan Italy afforded Copernicus with the necessary base that made the heliocentric system more realistic. Cosmopolitanism enriched Copernicus' knowledge with innovative ideas and broadened his view. We should not forget that Copernicus, being inspired by the spirit of Renaissance, studied Medicine and Humanities and finally received his doctorate in Canon Law. He also tried to learn Greek. He had his own Greek dictionary with his name written in Greek on the first page – probably bought when he was in Italy around 1500 and he even attempted to translate verses by a minor Byzantine epistolographer of the 7th century, Theofylactus Simocatta[1]. Although he had studied Astronomy and the basic principles of Aristotelian Philosophy during the four years he spent at Cracow University, he took the necessary step towards heliocentric model of the Cosmos when he became acquainted with cosmopolitanism Italy.

1. Although his translation cannot be compared with similar translations by Italian translators, he published it in Cracow in 1509 and nowadays it is considered to be very rare to be found. After all, it was one of the first attempts at translating such essays in northern Europe and it is the only book Copernicus published himself (Gingerich 2004, 41).

The years he later spent in his homeland after his return from Italy were very fruitful in every way for the introduction of his innovative heliocentric system for the planetary motions which led the impending revolution in Astronomy in particular and in sciences in general. The final composition he achieved, although his intentions were not so revolutionary, dismantled the Ptolemaic system and fundamentally changed the view of the Cosmos. In actual fact, the impact of the Copernican revolution went beyond the establishment of the new Astronomy: it formatted the most thrilling cultural change within the history of the western civilization (Kuhn [1957] 1985).

Despite the fact that Copernicus had spent several years in Italy, he did not place himself within scientific movements, circles etc (Goddu 2010, 171-173). Although the influence on him of the spirit of Renaissance is undoubtedly accepted, we have not traced any formal relations with academic circles after he graduated from Bologna and Padova (Gingerich 2004, 36). Moreover, his main work *De Revolutionibus Orbium Celestium* - first published in 1543 at Nuremberg – was the outcome of his working on his own when he returned to his homeland. Hence, he succeeded in reaching his revolutionary conclusions for the heliocentric system without working with others, undoubtedly recalling some of the ideas he had met with in Italy. Only the arrival of the young mathematician Georg Joachim Rheticus (1514-1574) in January 1539 (Westfall, 2003) interrupted his scientific loneliness. Rheticus lived with him in Frauenburg for two years. We do not know whether Rheticus had prior access to Copernicus's *Commentariolus*, an unsigned and unpublished outline of Copernicus' revolutionary work on the heliocentric theory that Copernicus himself had distributed to friends and colleagues three decades before he published *De Revolutionibus...*[2].

The outcome of the fruitful communication they both achieved during that period has been recorded in the *Narratio Prima* ("First Account"), the small book which Rheticus published during 1540 in Danzig (Gdańsk) where he introduced Copernicus's heliocentric ideas to his readers (Rosen, [1939] 2004).

It is most likely that Copernicus had agreed with this alternative way of presenting his work, or even more likely that, he had introduced him this idea to Rheticus himself. In attempting to trace the origins of this unusual way of presenting the new radical conclusions he had reached while working on the heliocentric idea, we must focus on Copernicus' par-

2. According to Koyré (1973, 18–28) and Rosen ([1939] 2004, 6-7 & 57-90), the *Commentariolus* ("Little Commentary") was a forty-page outline of an early version of his revolutionary heliocentric theory of the universe. Thoren (1990, 99) gives the length of the manuscript as approximately 40 pages. Copernicus wrote the *Commentariolus* before 1514 and circulated copies among his friends and colleagues. It was never printed during his lifetime. On November 1, 1536, Nikolaus von Schönberg, Archbishop of Capua and a cardinal before the preceding year, wrote to Copernicus from Rome asking him for a copy of his writings "at the earliest possible moment". Copies of the *Commentariolus* could be found for a time after Copernicus' death, but it lapsed into obscurity, and its previous existence remained known only indirectly, until a surviving manuscript copy was discovered and published in the second half of the 19th century. According to Rosen ([1939] 2004, 6-7), a manuscript copy of the *Commentariolus* was discovered in Vienna and published in 1878 and Koyré (1973, 76) indicates that a very poor copy was published in the 1854 Warsaw edition of *De revolutionibus*. Also Tycho Brahe obtained a copy in 1575, and subsequently presented copies to students and colleagues as tokens of his esteem (Dreyer 1890, 83; Thoren 1990, 98-99).

ticular personality and on the years he had spent in Italy being inspired by the humanistic Renaissance: on the one hand, he had stubbornly kept his work away from troublesome eyes and, on the other hand, he was in favor of the idea of presenting the heliocentric theory using an indirect method instead of publishing his work by himself. His choice of this literally procedure for the presentation of his work can remind us the broadminded efforts he undertook in Italy concerning literature and his attempts to translate Theofylactus Simocatta, a minor byzantine epistologrpaher of the 7th century, into Latin verses. This attempt probably indicates Copernicus' attitude to becoming acquainted with literature and humanities in general and not only with Astronomy. After all, we should not forget that his doctoral thesis at the University of Ferrara was on Canon Law. It seems that Copernicus chose an indirect path based on literature for announcing his heliocentric theory to a wide audience and gave Rheticus permission to publish the *Narratio Prima:* When he had to make a hard decision he turned to literature as the *appropriate form* for initially announcing his ideas to his contemporary colleagues.

However, Copernicus' deviation towards literary forms in order to introduce his scientific work is not visible within the *Narratio Prima* "project" only: It can be seen in the unsigned preface that was included in the 1st edition of the *De Revolutionibus Orbium Celestium*. The author of this preface was probably Andreas Osiander, and its main objective was most likely to eliminate the reactions of the clerical authorities against Copernicus' heliocentric theory. We cannot determine for certain whether Copernicus was aware of the preface, but it certainly adds a literal dimension to the scientific text. Even if Copernicus have not composed this preface, he might had inspired or prompted Osiander to compose it, choosing this literal form as a supplement to the purely scientific text.

II.

Kepler's relations to literature is on a different level. He had adopted the habit of commenting himself and his ideas writing short texts commenting on his work, expressing his anguish at certain issues as well his hopes for forthcoming events and meetings. It seems that he intended these notes either as future comments for himself or for future readers of his manuscripts: We can almost feel his excitement, his fears, his hopes. We can place them in a scheme where he had placed himself as the gifted secret interlocutor of God and interpreter of His Will. He also used the form of letters and had addressed several discussing astronomical issues to Michael Maistlin, Galileo and Tycho Brahe. His eagerness to express opinions on certain matters in his letters may sometimes caused him serious problems for his career, e.g. in the case of his enthusiastic letter to Ursus (Nicolaus Reimers Baer) - the man that Tycho Brahe hated more than anyone as he had stolen and published Tycho Brahe's idea of the planetary motion under his own name (known nowadays as "tychonic"). At the same time, he addressed his book *Mysterium Cosmograficum* to Tycho Brahe asking him to review it! On the other hand, we can find his personal views on certain matters as they were expressed beside the main text of his works, a nonstop, lifetime commentary work for himself! In my

opinion, this method can be considered as a certain sign of a lonely person as which Kepler was, in despite of the people gathered around him, i.e. problematic parents, family, wives and stillborn children, patrons and teachers.

III.

The various literary forms that operate as vehicles for introducing scientific ideas can be traced back to ancient science as well. We should recall the form of dialogue as it was introduced in the platonic texts and accepted also by Galileo.

Galileo, modeling his platonic view, chose this form for the introduction of his innovative approach to motions and his published *Letter to The Grand Duchess Christina* (1615)[3] and his famous Dialogues. This method of indirect presentation for his innovative approaches to Dynamics and Cosmology also appeared itself to be innovative. Under this scheme, Galileo's approaches appeared to be the result of logical objections to the Aristotelian natural philosophy in observations on every-day life and not as purely mathematical outcomes.

The *Letter to the Grand Duchess Christina* was Galileo's attempt to spread his Copernican views on the Cosmos (Reeves, 1991, 563). It was late in 1613 when one of Galileo's former students, Benedetto Castelli (1578 – 1643), a Benedictine monk, wrote to Galileo about the events that had taken place at a recent dinner with the Grand Duke Cosimo II de' Medici. During the conversation at the dinner Cosimo Boscaglia, a professor of philosophy, argued that the motion of the Earth could not be true, being contrary to the Bible. When dinner had ended, Castelli was called back to answer Christina's scriptural arguments against the motion of the Earth. The monk took on the role of theologian in response, and convinced everyone there except the Grand Duchess and Boscaglia. Galileo decided to address Christina because of her desire to learn more about Astronomy. On the other hand, Christina's position of power would also give the letter more exposure to other noble and Church leaders. Galileo put forward with this long letter in an attempt to present his position on the relation between science and Scripture.

Galileo wrote this letter in an effort to convince Christina about the compatibility of Copernicanism and the Scriptures (Moss 1983, 547). It served as a treatise in the guise of a letter, with the purpose of addressing the politically powerful, as well as his fellow mathematicians and philosophers. The goal of the secondary audience was targeted at whom he believed was condemning Copernicus. The failure of this stratagem was that he used Christina as his titular audience, instead of the shadow audience he truly sought to persuade. The result was that he was attempting to move an audience unfamiliar with his chosen topic, instead of those who were already favorably disposed on the topic of the movement

3. By 1615, with the controversy over the Earth's motion widespread and increasingly dangerous, Galileo revised this letter and greatly expanded it; it became the *Letter to the Grand Duchess Christina*. The letter circulated in manuscript but was not printed until much later, when the Inquisition had condemned Galileo. It appeared in Strasbourg in 1636 with both Italian and Latin text.

of the heavens. The final sequence of this letter was not actually as planned by Galileo and this was probably the result of the selfish and combative tone he had chosen for the letter and several readers resented his arrogant tone (Drake 1957, 173-216).

The *Dialogue Concerning the Two Chief World Systems* (*Dialogo sopra i due massimi sistemi del mondo*) was published in 1632 (Drake, 1967 [1953]). The characters who took active part in the dialogue were Salviati who spoke for Galileo, Sagredo who represented an intelligent layman – the common sense man and Simplicio who represented an unthinking believer in Aristotle's system. The other essay in which Galileo used the form of dialogue was the *Discourses and Mathematical Demonstrations Relating to Two New Sciences* (*Discorsi e dimostrazioni matematiche, intorno à due nuove scienze*), published in 1638 (Drake, 1974). *Discourses* was written in a style similar to the former *Dialogue*, and once more three men with the same names as before (Simplicio, Sagredo, and Salviati) discussed and debated the various questions Galileo sought to answer. However, there was a notable change in the opinions of those characters: Simplicio, in particular, was no longer quite as simple-minded and stubborn an Aristotelian as his name implied. His arguments were representative of Galileo's own early beliefs, Sagredo represented his middle period, and Salviati proposed Galileo's newest models. The literally forms of the Dialogue and Letter were very convenient for the presentation of scientific texts and played a distinctive role in the spread of the Galilean approach to mechanics and cosmology because they were used very effectively by Galileo. In addition, he even added certain quotes exhibiting sarcasm and highlighting his outstanding sense of humor even though occasionally he sidetracked to an arrogant tone.

IV.

In conclusion, we can say that literature has become a convenient alternative method for the presentation of pure scientific ideas, especially innovative ones. This method of introducing new ideas was chosen mainly in order to eliminate possible negative reactions from opponents taking into account that the freshly proposed issue was introduced under cover of an innovative approach. The main task of the authors remained the successful introduction and spread of the new ideas to the selected body of people. But why did they prefer to share their results through literature forms?

I think that when trying to answer this question we should focus not only on the alternative process that this method introduced but also on the literary background they had acquired earlier in their lives. It is most likely that this background was recalled by Copernicus and Galileo because they had become acquainted with literature - either as a formal study or as a part of the humanistic environment they were exposed to early in their lives.

References

Drake, Stillman. 1967 (1953). *Dialogue Concerning the Two Chief World Systems.* Berkeley & Los Angeles: University of California Press.

Drake, Stillman. 1957. *Discoveries and Opinions of Galileo*. New York: Doubleday Anchor Books.

Drake, Stillman. 1974. *Two New Sciences*. Madison: University of Wisconsin Press.

Dreyer, John L. 1890. *Tycho Brahe; a picture of scientific life and work in the sixteenth century.* Edinburgh: Adam and Charles Black.

Gingerich, Owen. 2004. *The Book Nobody Read*. London: William Heinemann.

Goddu, André. 2010. *Copernicus and the Aristotelian tradition*. Leiden, Netherlands: Brill.

Koyré, Alexandre. 1973. *The Astronomical Revolution: Copernicus – Kepler – Borelli.* Ithaca, NY: Cornell University Press.

Kuhn, Thomas. 1985 (1957). *The Copernican Revolution*. Cambridge, Massachusetts: Harvard University Press.

Moss, John D. 1983. "Galileo's Letter to Christina: Some Rhetorical Considerations." *Renaissance Quarterly* 36 (4): 547–576.

Reeves, Eileen. 1991. "Augustine and Galileo on Reading the Heavens." *Journal of the History of Ideas* 52 (4): 563–579.

Rosen, Edward (translator). 2004 (1939). *Three Copernican Treatises: The Commentariolus of Copernicus; The Letter against Werner; The Narratio Prima of Rheticus*. New York, NY: Dover Publications, Inc.

Thoren, Victor E. 1990. *The Lord of Uraniborg*. Cambridge: Cambridge University Press.

Westfall Richard S. 2003. *Rheticus, George Joachim, Catalog of the Scientific Community of the 16th and 17th Centuries*. The Galileo Project.

SCIENCE AND SCIENTISTS IN CRIME STORIES

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Introduction

The discussion concerning crime stories has, in the past few years, become more and more interesting, given that this genre is obviously a social phenomenon: millions of people in dozens of countries in all continents read the crime novel. This paper does not aim at revisiting the general critical discussion pertaining to the mystery novel, i.e. whether it constitutes literature or paraliterature. This discussion is endless. What can be discussed here is the wide appeal of the crime stories and its extensive readership, which will allow us to draw general conclusions concerning the image of sciences as reflected in these texts, shaping at the same time the views of readers in different historical periods and various epistemological frameworks. The theoretical approach adopted is that of the classical dialectical method according to Ernest Mandel (Mandel 1984).

Science as a tool for resolving crime cases

The relationship between science and crime stories dates back to the emergence of the genre, in the 19th century. The "classical" mystery novel with the structural elements we are familiar with, namely the "whodunit" form, appears in the 19th century. We will consider Edgar Allan Poe's *The Murders in the Rue Morgue* in 1843 as the genre founding novel. In this text, characterized as emblematic (Eisenzweig [1983] 1986, 10), the author sums up his opinion on the appropriate way of solving the problems the detective-hero faces as follows:

> "The mental features discoursed of as the analytical, are, in themselves, but little susceptible of analysis. We appreciate them only in their effects. We know of them, among other things, that they are always to their possessor, when inordinately possessed, a source of the liveliest enjoyment. As the strong man exults in his physical ability, delighting in such exercises as call his muscles into action, so glories the analyst in that moral activity which disentangles. He derives pleasure

> from even the most trivial occupations bringing his talent into play. He is fond of enigmas, of conundrums, of hieroglyphics; exhibiting in his solutions of each a degree of acumen which appears to the ordinary apprehension præternatural. His results, brought about by the very soul and essence of method, have, in truth, the whole air of intuition." (Poe 1943)

Analysis, therefore, as an indispensable tool of problem-solving, not mere intelligence. Combined of course with intuition, as Poe points out in his short story "The Purloined Letter" (Poe 1844). Le chevalier Dupin appears as a representative of ratiocination, i.e. deductive reasoning following strict rules, through which he manages to solve the problems he selects because they constitute a mental challenge and not because he is obliged, e.g. professionally, to get involved.

Poe's work paved the way for detective fiction as it was formed in the late 19th c. Based on the actions and character of detective-analyst Dupin, the classical mystery tale will take form, with a strictly organized structure and heroes who rely upon "scientific" modes of thought, that is, close observation and austerity of deduction.

The Detective Fiction, as a genre, constitutes part of the *bourgeois novel*, that is, a novel that mainly addresses the bourgeoisie but will soon include in its readership the petite bourgeoisie, as well. It is a genre structured as a mental exercise aiming primarily at entertainment, an era-specific popular fiction, thus appealing mainly to the bourgeoisie and petite bourgeoisie.

If we examine these texts in their historical context, one can expect the overtly expressed perception of reason as a tool for the detection and interpretation of problems. In the second half of the 19th c. scientific discovery boosts an optimism based on the laws of reason, which is mainly supported by deduction. In the scientific field, positivism is the dominant concept which in turn shapes the dominant ideology. Thus, the general belief pervading bourgeois thought is faith in human development through science.

According to the era's bourgeois ideology, science as a benevolent force is there to transform human society for the better. The world, therefore, will be teleologically improved if scientific principles are implemented in the thoughts and actions of the individual who will shape a new social model founded on logic. Technological development applies in practice the latest scientific discoveries and thus functions as proof of the power of rational thought. In this way, the dominant ideology assimilates both faith in progress and the beneficial role of rational thought virtually unchallenged. Even when doubt is expressed, it only concerns a confined circle in the academic community. At the same time, this obsessive devotion to the power of science and its unyielding laws serves as a safeguard for the teleological evolution of the system and the perpetuation of the natural order, in the form of preserving a steady social hierarchy against a series of threats to the present equilibrium, such as the socialist programs that are starting to appeal to members of the working class. Mystery writers, not being scientists themselves nor belonging in the scientific community, receive these general principles of the bourgeois ideology and convey them to the reader by simplifying

and formalizing them. This is to be expected if one considers what has been noted, that is, that this is a genre aiming at a wide audience and offering an escape, a pleasant break from reality, not a general reflection on society or self. Thus, Sherlock Holmes, Sir Arthur Conan Doyle's protagonist and one of the archetypes that will be reproduced in many forms, often does not even need to visit the crime scene in order to solve the crime, but turns criminology into an exact science, whereas Agatha Christie's Hercule Poirot is aided only by the "little grey cells" in his brain to solve his own cases, following deductive and inductive reasoning to restore the order which has been momentarily disrupted by the crime. This restoration of order, the eternal victory of good, in the form of the detective who, aided by deductive and inductive reasoning, vanquishes the law-breakers for the law to be upheld, is what gave the genre a sense of social conservatism (Mandel 1984), which was maintained at least until the Interbellum (McCarthy 1936) and the writers that will differentiate it on all levels, beginning with Americans Dashiell Hammett and Raymond Chandler.[1]

To sum up, it seems that in this early period of the crime novel sciences are presented as ideologically and socially neutral, reflecting the dominant epistemological approach. Furthermore, their utilitarian use as a narrative principle serves to preserve balance and maintain the status quo.

Science as a structural element in the crime stories

Sciences reappear in the crime stories after a long period during which the genre evolves and acquires a series of new characteristics. The crime novel is no longer a story circulated in a closed bourgeois environment. The attitude of this type of novel has changed greatly and it may now be the formula which allows wider socio-political issues to be touched on (many of the works of contemporary francophone and hispanophone mystery literature are of this sort).[2] In this period, sciences are once again connected with the mystery novel, appearing not mainly as a tool, however, but as a narrative and structural element. This concerns several fictional texts in which sciences constitute an integral part of the plot, motive and probable cause for the criminal acts described and a chance to reflect on science itself.

An example of this kind of detective story is Veronique Roy's *Museum* (Roy 2006), which refers to a controversy between evolution and creationism. In a natural history museum, this controversy becomes the motive for a series of murders. The author, by presenting this particular dispute, portrays science as a battlefield. Writers such as Paul

1. Mary McCarthy in this article comments the way that many writers present the communists as scourge and use crime novels "to serve the status quo".
2. E.g., Paco Ignacio Taibo II, Leonardo Padura, Patrick Raynal, Caryl Rerey, J.-P. Manchette, Frederic H. Fajardie, Didier Daeninckx.

McEuen (McEuen 2011) and Mark Alpert (Alpert [2008] 2011), both of them physicists, fall in the same category. Their work focuses on problems of physics, in the form of crime stories.

There is a second category of crime novels which refer to sciences, and they situate crime stories in the expanding landscape of the public understanding of science, using the form of crime novels. An example is *The Einstein Paradox* by Colin Bruce (Bruce 1998).

Finally, a third category comprises novels which portray scientific criminal investigations. The detectives here are anthropologists, forensic surgeons, computer experts, physicists or chemists who solve crimes through their expertise. Here, sciences are crime-solving tools. The main argument of this kind of crime stories is that science is always right, and their writers are more or less Americans, such as the very popular Kathy Reichs,[3] Patricia Cornwell,[4] etc. This kind of stories is more in line with classical bourgeois crime stories.

Conclusions

The differentiation from the classical mystery novel is first of all related to the kind of reading audience this genre fiction traditionally addressed to. Concerning the appeal, therefore, it is made obvious by the sales figures that contemporary literature targets a wide audience, though educated and with particular interests. Today's "scientific mystery novel" is not just an "escapist entertainment" (Mandel 1984, vi), but is often written to reveal bigger issues regarding the role and function of science and scientists. And that is where the danger of didacticism and/or unbelievability lurks, a touchstone where every author is judged. Nevertheless, despite all those that have to do exclusively with narrative possibilities and techniques, the structure that does not focus on the mystery per se but on the scientific problem reveals wider issues. Through the narrative, issues of scientific and epistemological nature are posed, finally disputing historically dominant ideas and figures.

Breaching certainty is also expressed through the rejection of the manichaeistic duality good vs evil, protector of the law and society vs outlaw, as it appears mostly in the first category. The perpetrator is not necessarily led to the law and order is not restored to previous forms but the crime establishes a new balance. In this way, the rational thinker does not always reach obvious success, based on traditional commonly accepted models, and reality appears woven from several conflicting levels. This approach is relevant with the general change of crime stories, where there is growing scepticism about law and order in the past few decades (Mandel 1984, 132).

3. http://kathyreichs.com/ (Last accessed 29 Aug 2020)
4. http://www.patriciacornwell.com/ (Last accessed 29 Aug 2020)

The characterology which takes place in genre fiction reflects the above-mentioned parameters. Protagonists are not single layered; furthermore, the scientific capacity and rational thought do not directly entail the role of the virtuous champion, as in the classical mystery novel. It is worth mentioning here that sexism in this literary trend is evident. I am certainly not referring to cases of notable personalities from the history of sciences, who are exclusively male. This is a non-negotiable fact. Moreover, one could not reasonably expect a plethora of female scientists in, let us say, the 19th or even the early-20th century. But looking at the rest of the characters, scientists, even students when mentioned, are still predominantly male similarly to the detective-heroes of the past. It appears that certain socially defined models cannot easily be disputed... Female scientists, when they appear, are no different than the given male models that dominate the image of the scientist. Computer experts are the only notable exception.

It must be noted that all that has been said is true in the case of fiction with high literary standards. Selectively mentioning a few, I obviously overlooked other important works of fiction. Besides, several works have been published in the last few years which could be generally included in this category, some of which incited an enthusiastic response from readers. Nevertheless, a danger lurks here, which intensifies as time passes and this literary trend becomes clearer as a category. I am referring to fictional texts that follow a successful recipe and become popular. These texts, starting theoretically with a scientific problem, try to reproduce formulas and end up as caricatures. These are oversimplifying fictions, notably obsessed with uncovering mystical conspiracies in science, or revealing non-existent "race" superiorities, etc. But since humanity poses only the questions it can answer, as one of the classics used to write, the final decision is left to the reader...

References

Alpert, Mark. 2008. *Final theory*. Touchstone.

Alpert, Mark. 2011. *Omega Theory*. Touchstone.

Bruce, Colin. 1998. *The Einstein Paradox*. Basic Books.

Cornwell, Patricia. http://www.patriciacornwell.com/

Eisenzweig, Uri. 1983. *Autopsies du roman policier*. Paris: 10/18. (In Greek 1986. "Οταν το αστυνομικό μυθιστόρημα έγινε είδος", *Ανατομία του αστυνομικού μυθιστορήματος,* 9-38. Athens: Agra.)

Mandel, Ernest. 1984. *Delightful Murder. A social history of the crime story*. London et.el.: Pluto Press.

McCarthy, Mary. 1936. "Murder and Karl Marx." *The Nation,* March 25, 1936.

McEuen, Paul. 2011. *Spiral*. New York: The Dial Press.

Poe, Allan P. 1844. "The purloined letter", *The Gift: A Christmas, New Year, and Birthday Present, 1845.* Philadelphia: Carey and Hart.

Poe, Allan P. 1943. *Murders in the rue Morgue*. Philadelphia: William H. Graham.

Reichs, Kathy. http://kathyreichs.com/

Roy, Veronique. *1*996. *Museum*. Paris: Librairie Artheme Fayard.

SCIENCE, TECHNOLOGY AND SOCIETY, SEARCHING FOR THE ENEMY OF THE PEOPLE

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Introduction

Literature is one of the various forms through which science and technology can be communicated to the public. There is a wide variety of novels, poetries, science fiction and dramas that, either wholly or partly, deal with issues relating to science and technology and how they affect people's affairs and everyday life (Whitney, 1924). In this context, literature contributes in constructing a public image for science and technology in a special way.

In our paper we consider issues regarding scientific disputes and public policy in the drama of Henrik Ibsen called *An Enemy of the People* [also translated as *A Public Enemy*] (1882), a play in five acts. In the play, Tomas Stockmann is a doctor working in the baths of a small Norwegian town, where he lives with his wife and children. Doctor Stockmann is a popular citizen. He finds out that the waters of the town's new thermal baths are being polluted. The doctor informs the authorities and suggests solutions to deal with the risks of causing diseases to those using the baths. At the beginning he is supported by his family, his friendly environment and the local media. However, the issue of repairing the baths has serious trade offs. The mayor of the town, Peter Stockmann, who is the doctor's brother and director of the baths committee, considers that it could lead to the financial devastation of the town. The mayor takes action so that the alleged pollution of baths will not get publicized. At a town meeting the different positions are presented and the doctor's opinion loses its merit in the public. The whole affair has dramatic consequences for his family and himself; his patients desert him, he is dismissed from the baths, his daughter Petra loses her job as a teacher and the family loses its home. Doctor Stockmann considers moving abroad with his family. However, when his fellow citizens break his windows and threaten him, he decides to stay in his hometown and devote himself to the task of protecting the liberty of his fellow-citizens.

Henrik Johan Ibsen (20/03/1828 – 23/05/1906) was a major 19th-century Norwegian playwright, theater director, and poet.[1] He is often referred to as "the father of realism" and is one of the founders of modernism in theater. Several of his plays were considered scandalous to many of his era, when European theater was required to model strict morals of family life and propriety. He utilized a critical eye and free inquiry into the conditions of life and issues of morality. According to an early Marxist art critic, "Ibsen's plays unquestionably voice the protest of the determined and powerful petty bourgeoisie against antagonistic capitalist principles" (Lunacharsky 1934). Ibsen's work reflects western society during the processes of transition from the era of pre-modernity to that of modernity.

An Enemy of the People is considered a "pioneering" play for its time.[2] The nature of the issues being negotiated in this drama make it a timeless play that can illustrate in the best mode key issues that have emerged in the interdisciplinary field of studies called *Science, Technology & Society* or *Science and Technology Studies* (STS) in the recent decades. Although *An Enemy of the People* has been rated in various ways at different times, nowadays it can be seen as a play that criticizes the way in which decisions are made for a number of technoscientific and public health issues, and how these are discussed in the public sphere and politics.[3]

In this paper we aim at exploring certain issues in Ibsen's play as we consider them relevant in discussions about the science and society relationship. This approach emanated from brainstorming ideas upon watching Ibsen's play since to our mind the play echoed topics that can be identified in recent discussions in the field of STS.[4] In the remaining part of this section, we shall briefly introduce some key ideas from the STS scholarship that inspired this paper. Following this, we shall relate them to the problematic of the theatrical play.

The area of STS grew out of activist movements during the 1960s and 1970s that criticized the developments of science and technology, for example the movements against

1. A short biography of Henrik Ibsen is available at the National Library of Norway (all about Ibsen section). Available at: http://ibsen.nb.no/id/11130435.0
2. The drama *An Enemy of the People* has been analyzed from various perspectives. For example, according to Helge Ronning, a Norwegian literature researcher, the play dramatizes some of the "problems of the development of a full-fledged capitalist society", and in particular "the conflict of individuality versus common interests" ([1977] cited in Van Laan, 1986, 98).In a recent paper, Johannes Brinkmann (2009), a professor at the Norwegian Business School, explores the ways in which parts of Ibsen's plays can serve as food for thought in a context of business ethics teaching.
3. Irrespective of any theatrical analysis and review of the play, its acceptance by the public has mostly been positive (Lunacharsky, 1934; Stanislavski 1952; Anon, n.d.). According to McFarlane, "*An Enemy of the People* generally ranks as one of the thinnest of Ibsen's mature works" ([1960] cited in Van Laan, 1986, 96). In addition, it has been characterized as one of his most straightforward plays ever, lacking almost entirely the hallmarks of complexity and ambiguity that have contributed to making Ibsen one of the world's foremost dramatists (Van Laan, 1986, 96).
4. We consider ourselves privileged to having had the opportunity to watch a wonderful performance of the play *An Enemy of the People* by the German theatrical company Schaubühne Berlin (Athens Festival, 07/2013).

environmental degradation and anti-nuclear activism. Academically it flourished from the end of 1970s. As a field of study, it has strong ties with the already established disciplines of the history of science and the history of technology. It draws from a variety of disciplines like history, sociology, anthropology, and political science. The main interest of STS is to study science and technology as social processes that are active. Technoscience has shaped the world around us and at the same time is being shaped by society (Bijker 1995, 288). At the beginning, STS was more focused on science studies and the research performed emphasized on analysis of scientific controversies and moved "inside the laboratories". The period in the mid-1980s marked a "turn to technology".[5] The field of STS has been quite diverse since, with different theoretical frameworks having been proposed and utilized. The theories invoke various degrees of social constructivism.[6]

In the following sections, we analyze the play in relation to two main issues. First, we consider the public image of the scientist, in this case a doctor, and the way he builds his authority regarding the scientific facts. Then, we focus on the way the dispute about the polluted baths reaches the public through the formation of networks. We believe that Ibsen's play provides us with interesting insights on contemporary questions regarding science and technology policy.

The play and STS:

The public image of the scientist/doctor and the scientific data

a. Dr. Stockmann: *A man of science* and *an enemy of the people*

The public image of scientists in the 19th century, according to historical accounts, is twofold. In the great majority of studies about popular science, according to cultural historian Peter Broks (1993), fiction has contributed in creating the stereotype of the evil scientist while in factual articles scientists were nothing less than heroes. He further argued that "almost to a man (and they were all men) fictional scientists were portrayed as, at best, unemotional and detached, and, at worst, inhuman and insane. They actively connived at the deaths of others, failed to see the dangerous implications of their work, or were indifferent to the suffering that their research might cause" (Broks 1993, 127). In non-fiction the treatment was altogether different. The list of virtues attributed to real scientists was, if anything, even more comprehensive than the corresponding list of vices of their fictional counterparts (Broks 1993, 129). In the middle of the 19th century, doctors had been a socially recognized group; however, only a few doctors in this era were well-off, of high social status, or intellectually supported by a demanding education (Hansen 2009, 13). It is important to note that a "doctor was recognizable in life and

5. For more one can see the following seminal volumes: Bijker, Hughes & Pinch 1987; Bijker& Law 1992.
6. For an introduction to the field of STS one can read Sismondo 2010.

in newspaper graphics, cartoons, and caricatures as a man (almost always) wearing a dark suit" (Hansen 2009, 13–14).

In this context, the scientist-doctor in *An Enemy of the People* appears both an active member of society (see scenes with social lunch in Act I) and a responsible citizen who cares about the community in which he lives (see mainly Act IV). This is a public image of a scientist that differs from the usual image of one who is isolated in his lab and away from the society, one who is dedicated exclusively to the interpretation of experimental data. Although Doctor Stockmann notes that he lived for many years isolated and devoted to his studies, the doctor (at the present time of the play) considers that "a scientific man must live in a little bit of style" (Ibsen [1882] 2010, 10). Moreover, Doctor Stockmann appears with two opposite faces/images. In the first two acts of the play Doctor Stockmann is considered to be a scientific "authority" and his scientific findings make him a person with prestige who is appreciated in his town. However, this public image dissolves in the next three acts of the play. He is accused by the local society as an enemy of the people because of his faith in his scientific findings.

b. The production of scientific data

It is noteworthy that in 1882, the year that Ibsen wrote the drama *An Enemy of the People*, the German physician and microbiologist Robert Koch (11/12/1843 – 27/05/1910) discovered the bacillus of human tuberculosis (Mycobacterium tuberculosis), afterwards known as "Koch's bacillus", as well as the germ of cholera (Vibrio cholerae). In addition, Koch worked on infectious diseases and systematized research through the microscope. Moreover, in the same period the French chemist and microbiologist Louis Pasteur (27/12/1822 – 28/09/1895) announced the successful inoculation of a person with his experimental rabies vaccine. Pasteur has been renowned for developing the main principles of vaccination, microbial fermentation and pasteurization. His medical discoveries provided direct support for the germ theory of disease and its application in clinical medicine.

In this context, it is notable that during the same age in which Koch and Pasteur were portrayed in the public culture as scientists–"national heroes", who relieved society of microbes, Doctor Stockmann was considered a "demented scientist", while he was actually trying to protect the community he lived in (Brock 1988; Latour [1984] 1988). This image of Doctor Stockmann is associated not only with his political views and his explosive character, but also with the way the scientific issues, such as the existence and the role of microbes in causing various diseases in the late 19th century, were understood by the public.

Dr. Stockmann had observed some visitors of the local thermal baths becoming infected with a disease. These observations made him examine the water of the municipal baths. He stated that he "had none of the necessary scientific apparatus; so [he] sent samples, both of the drinking-water and of the seawater, up to the University, to

have an accurate analysis made by a chemist" (Ibsen [1882] 2010, 19). According to the results of the analysis the baths were polluted. Doctor Stockmann said that "the place is a pest-house" (Ibsen [1882] 2010, 18). For the doctor, the analysis "proves the presence of decomposing organic matter in the water-it is full of infusoria. The water is absolutely dangerous to use, either internally or externally" (Ibsen [1882] 2010, 19).

Doctor Stockmann informed his family and close friends about his findings. The scientific findings he presented were not easily accepted by all the other characters. The germ theory of disease had not been fully accepted in the public sphere by this time and the role of microbes in causing various diseases was disputed because they were not visible. The doctor's father-in-law, Morten Kiil, had the following discussion with the doctor:

> Morten Kiil: And a lot of these beasts had got in, the baths
> Dr. Stockmann: Certainly; hundreds of thousands of them, probably.
> Morten Kiil: But no one can see them – isn't that so?
> Dr. Stockmann. Yes; you can't see them.
> Morten Kiil: Damn – it's the finest story I have ever heard!
> Dr. Stockmann: What do you mean?
> Morten Kiil: But you will never get the Mayor to believe a thing like that. (Ibsen [1882] 2010, 24)

The above quote is revealing as it highlights an open issue in epistemology, one related to scientific realism. We note that at the time the play was written there was an undergoing crisis of realism about whether entities, situations and procedures that were described in scientific theories could be found in nature. Microbes become real once we can observe them with a microscope (representation) and manage them with several techniques (intervention) (Hacking 2002). The doctor appears here as a strong realist. Unlike him, Morten Kiil represents a skeptic who challenges the entity of microbes because they are very small and invisible to the human eye.

In a subsequent act, during the discussion between the doctor and the mayor when the latter is informed about the doctor's findings regarding the polluted water, we can observe the way in which the scientific data are evaluated as such, not only on the basis of the analysis conducted by a university laboratory but also on economic and political grounds. In the following excerpts from their discussion this is notable:

> Peter Stockmann: At least. And what are we to do with the Baths in the meantime? Close them? Indeed, we should be obliged to. And do you suppose anyone would come near the place after it had got out that the water was dangerous?
> Dr. Stockmann: Yes but, Peter, that is what it is.
> Peter Stockmann: And all this at this juncture—just as the Baths are beginning to be known. There are other towns in the neighborhood with qualifications to attract visitors for bathing purposes. Don't you suppose they would immediately

> strain every nerve to divert the entire stream of strangers to themselves? Unquestionably they would; and then where should we be? We should probably have to abandon the whole thing, which has cost us so much money—and then you would have ruined your native town.
> Dr. Stockmann: I—should have ruined—!
> Peter Stockmann: It is simply and solely through the Baths that the town has before it any future worth mentioning. You know that just as well as I.
> Dr. Stockmann: But what do you think ought to be done, then?
> Peter Stockmann: Your report has not convinced me that the condition of the water at the Baths is as bad as you represent it to be.
> Dr. Stockmann: I tell you it is even worse!—or at all events it will be in summer, when the warm weather comes.
> Peter Stockmann: As I said, I believe you exaggerate the matter considerably. A capable physician ought to know what measures to take—he ought to be capable of preventing injurious influences or of remedying them if they become obviously persistent. (Ibsen [1882] 2010, 34)
> [...]
> Peter Stockmann: As an officer under the Committee, you have no right to any individual opinion. [...]
> Dr. Stockmann: This is too much! I, a doctor, a man of science, have no right to—!
> Peter Stockmann: The matter in hand is not simply a scientific one. It is a complicated matter, and has its economic as well as its technical side" (Ibsen [1882] 2010, 38).

According to the doctor, the scientific evidence should drive the authorities to undertake the reconstruction of the baths to ensure public health regardless of the costs incurred. On the other hand, the mayor proposes technical modifications so that the baths would not be closed for a long period of time to be reconstructed and would not hinder the town's touristic development. In order to support his position, the mayor doubts the validity of the scientific evidence. Their discussion also included the initial plans for the construction of the baths, and their desirable location. The doctor had proposed the source of the water be at a higher altitude, whereas the final plan for the construction that the municipality funded located the baths closer to the town, at a lower altitude, near the factories of the town. The factories were the source of the pollution.

Science and authority: Actors and networks

a. Acceptance

The second point we explore in this paper is the way the main actors in the play build their networks to support their positions regarding the scientific evidence about the pollution of the water of the baths. In order to do this, we turn to a prominent theory in

STS called Actor-Network Theory (ANT), developed mainly by Bruno Latour and Michel Callon. ANT has served to explore the processes that lead to the construction of a scientific fact (or an artifact). These processes are not straightforward. The focus is on the formation of networks of actors, heterogeneous actors that can be human and non-human. The actors build networks in order to "enroll" other actors, by "translating" their interests so that they become common and in agreement with other actors' interests. A great example comes from the work of Latour regarding Louis Pasteur and the alliances he built to achieve his goals, to establish his findings regarding the microbes and vaccination (Latour [1984] 1988). According to Latour, a network was created through the process of translation that served the interests of all the actors: Pasteur, one of his pupils, the vaccines as serums and the medical doctors. Latour, in his book *Science in Action* (1987), has portrayed the various resources that scientists use in order to support their views, which include rhetorical resources, established power, devices and facts. The main process is that of translation: "the interpretation given by the fact-builders of their interests and that of the people they enroll" (Latour, 1987, 109).

The main actors in the play are: the doctor, the town authorities (mayor), the editor and the journalist of a local newspaper, a moderate citizen – representative of the community's taxpayers and small tradesman (Aslaksen) who is also the sponsor of the local newspaper, the doctor's family, and the scientific data. The doctor tries to enroll the other actors to form a network in order to support his cause for the benefit of public health. Thereafter, the same is done by the mayor, representing the power/official authorities.

As we mentioned, Doctor Stockmann took the initiative to examine the water of the baths. The results of the analysis showed that the baths were polluted. Doctor Stockmann shows faith in the scientific data, and the letter with the news is an important actor. With this information in hand he begins to build a network to support his duty to serve his community by disclosing this information. At first he enrolls his family and his friends. One of his friends is the editor-in-chief at a local newspaper who agrees to publicize the issue to support the cause. The process of *translation* is not straightforward since the editor shares the interests of the doctor, but his support also serves his own interests to expose the mismanagement of the case by the official authorities. Following that, the doctor enrolls the sponsor of the newspaper, Aslaksen, who describes himself as a moderate citizen who cares for the good of the taxpayers and represents the city's small tradesmen. Aslaksen says: "We shall proceed with the greatest moderation, Doctor. Moderation is always my aim; it is the greatest virtue in a citizen – at least, I think so" (Ibsen [1882] 2010, 28). In addition, the doctor enrolls his father-in-law, who, for his own reasons, wants the story to be revealed.

However, when he talks with the mayor (Peter Stockmann) their interests do not seem to reconcile. As noted before, the mayor proposes technical modifications so that the baths will not be closed for a long period of time. He even rejects the scientific evidence that the doctor is based on. For the mayor: "The water supply for the Baths is

now an established fact, and in consequence must be treated as such" (Ibsen [1882] 2010, 35). Peter Stockmann does not consider the data his brother presented as a 'fact'. The following excerpt from their discussion shows what will come next.

> Peter Stockmann: As an officer under the Committee, you have no right to any individual opinion.
> Dr. Stockmann (amazed): No right?
> Peter Stockmann: In your official capacity, no. As a private person, it is quite another matter. But as a subordinate member of the staff of the Baths, you have no right to express any opinion which runs contrary to that of your superiors.
> Dr. Stockmann: This is too much! I, a doctor, a man of science, have no right to–!
> Peter Stockmann: The matter in hand is not simply a scientific one. It is a complicated matter, and has its economic as well as its technical side.
> Dr. Stockmann: I don't care what it is! I intend to be free to express my opinion on any subject under the sun.
> Peter Stockmann: As you please – but not on any subject concerning the Baths. That we forbid.
> Dr. Stockmann (shouting): You forbid–! You! A pack of–
> Peter Stockmann: I forbid it–I, your chief; and if I forbid it, you have to obey.
> Dr. Stockmann (controlling himself): Peter–if you were not my brother–" (Ibsen [1882] 2010, 38)
> [...]
> Dr. Stockmann: It is I who have the real good of the town at heart! I want to lay bare the defects that sooner or later must come to the light of day. I will show whether I love my native town.
> Peter Stockmann: You, who in your blind obstinacy want to cut off the most important source of the town's welfare?
> Dr. Stockmann: The source is poisoned, man! Are you mad? We are making our living by retailing filth and corruption! The whole of our flourishing municipal life derives its sustenance from a lie!
> Peter Stockmann: All imagination—or something even worse. The man who can throw out such offensive insinuations about his native town must be an enemy to our community (Ibsen [1882] 2010, 40).

The doctor's positions seem clear and he is ensured that the public benefit will prevail. He has built his network to achieve his goals and serve his role as a doctor and as a member of the local community.

b. Rejection

Following the discussion between the two main actors, the mayor decides to take action in order to pursue his interests. For the mayor, the normal operation of the baths serves the prosperity of the community. In order to gain support, he tries to build his

own network. His approaches the editor of the newspaper and there he meets Aslaksen. He uses his own rhetorical strategies to translate the issue at stake and, at the end, he manages to enroll them in his own network. The case, according to the mayor, is that the baths would be closed for two years and the municipality would have to take out a loan to finance the alterations, a loan to be paid by the taxpayers and not by the baths' proprietors. He further questions the validity of the scientific evidence that the doctor had presented regarding the dangers from the polluted water. This is a small excerpt at the end of the discussion:

> Peter Stockmann: The most fatal part of it is that we shall be obliged to shut the Baths for a couple of years.
> Hovstad: Shut them? Shut them altogether?
> Aslaksen: For two years?
> Peter Stockmann: Yes, the work will take as long as that — at least.
> Aslaksen: I'm damned if we will stand that, Mr. Mayor! What are we householders to live upon in the meantime?
> Peter Stockmann: Unfortunately, that is an extremely difficult question to answer, Mr. Aslaksen. But what would you have us do? Do you suppose we shall have a single visitor in the town, if we go about proclaiming that our water is polluted, that we are living over a plague spot, that the entire town—
> Aslaksen: And the whole thing is merely imagination?
> Peter Stockmann: With the best will in the world, I have not been able to come to any other conclusion.
> Aslaksen: Well then I must say it is absolutely unjustifiable of Dr. Stockmann — I beg your pardon, Mr. Mayor.
> Peter Stockmann: What you say is lamentably true, Mr. Aslaksen. My brother has unfortunately always been a headstrong man.
> Aslaksen: After this, do you mean to give him your support, Mr. Hovstad?
> Hovstad: Can you suppose for a moment that I—?
> Peter Stockmann: I have drawn up a short resume of the situation as it appears from a reasonable man's point of view. In it I have indicated how certain possible defects might suitably be remedied without outrunning the resources of the Baths Committee (Ibsen [1882] 2010, 56).

The mayor enrolls the other actors and presents an official statement so that it gets publicized instead of the doctor's report. The doctor goes back to the newspaper's offices, where he is informed that the editor and Aslaksen have changed their mind. The editor was no longer willing to publish his article with the report on the baths' condition. The doctor's network has fallen apart, and he is supported only by his wife and a few friends.

Doctor Stockmann decides to call a public meeting in order to disclose the information to his fellow citizens. Act IV of the play is devoted to the public meeting. The final

act concludes the play in the aftermath of the meeting and the repercussions it had on the life of Doctor Stockmann. We would like to briefly comment that in this paper we do not deal with the two last acts of the play. During the town meeting the issues discussed revolve around the democratic processes of governance and power. Doctor Stockmann considers that he is part of the minority and has to fight the majority, what Ibsen names "compact majority".[7] We consider it important that the doctor decides to publicly deliberate on a scientific issue dealing with the people's health by holding a town meeting. This suggests a more participatory mode of decision-making.

Concluding remarks

Following this analysis of the play, we present in this section our findings. We concentrated on an analysis of Ibsen's play in connection to STS theoretical aspirations, by bringing its plot into contact with recent questions about the relationship between science and society. STS studies have analyzed scientific controversies and disputes and have shown that they are socially constructed. The scientific facts do not get accepted in a straightforward manner in a society. *An Enemy of the People*, a play that was written in the late 19th century, can be seen nowadays as a great literary–theatrical transcription of the central theoretical axes of the ANT. Although Ibsen focuses on the subject of bourgeois democracy under capitalism, the role of the compact majority and the decision-making in a political community at a small provincial town, the issues of scientific authority, scientific validity and controversy about a scientific matter in the public sphere are placed at the center of the story. Ibsen, a sensitive observer of social and political events of his era, reflected in his works the sociopolitical realities of his time. In this context, at a time when science had begun to increasingly transform the lives of people, *An Enemy of the People* is a pioneering play but also timeless due to highlighting the social aspects of science and of the scientist as a person who is part of an institutionalized social system. Ibsen's play provides us with an exemplar case in which the acceptance of a scientific fact is dependent on social parameters like the building of alliances and their power, and not only on the validity of the scientific discovery.

Therefore, we propose that STS approaches can assist literature analysis regarding issues of the public image of science and technology as they appear in literature. At the same time, we are aware that literature, a form of public culture, is an important area for the construction of the public image of science and technology in the various periods, and therefore necessary for more comprehensive understandings of science and technology from historical and STS perspectives. Thus, we argue that the relationship between STS and literature can be mutually beneficial. STS can enrich literature studies

7. For more on this issue see the analysis of Plekhanov 1891.

by re-analyzing literature with a more specific point of view. And the understandings of science and technology can be advanced from studies on literature.

References

Anon. n.d. *Stanislavski on the 1905 Production*. Accessed June 30, 2014. http://www.mckellen.com/stage/enemyla/stanis.htm

Bijker, Wiebe. E., Hughes, Thomas. P. & Pinch, Trevor, eds. 1987. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology.* Cambridge, MA: MIT Press.

Bijker, Wiebe. E. & Law, John, eds. 1992. *Shaping Technology/Building Society: Studies in Sociotechnical Change.* Cambridge, MA: MIT Press.

Bijker, Wiebe. E. 1995. *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. Cambridge, MA: MIT Press.

Brinkmann, Johannes. 2009. "Using Ibsen in Business Ethics." *Journal of Business Ethics* 84: 11–24.

Brock, Thomas. D. 1988. *Robert Koch: A Life in Medicine and Bacteriology.* Berlin: Springer.

Broks, Peter. 1993. "Science, media and culture: British magazines 1890–1914." *Public Understanding of Science* 2(2): 123–139.

Hacking, Ian. 1983. *Αναπαριστώντας και Παρεμβαίνοντας. Εισαγωγική Θέματα στη Φιλοσοφία της Φυσικής Επιστήμης*. Translated by Tasos Tsiantoulas. Athina: Panepistimiakes Ekdoseis EMP.

Hansen, Bert. 2009. *Picturing Medical Progress from Pasteur to Polio: A History of Mass Media Images and Popular Attitudes in America*. New Brunswick, New Jersey, and London: Rutgers University Press.

Hanssen, J. M. 2006. "Short Ibsen biography". National Library of Norway. Accessed June 30, 2014. http://ibsen.nb.no/id/11130435.0

Ibsen, Henrik. 1882. *An Enemy of the People*. Translated by Farquharson Sharp. Accessed January 30, 2014. http://www2.hn.psu.edu/faculty/jmanis/h-ibsen/enemy-people.pdf

Ibsen, Henrik. 1882. *Ένας Εχθρός του Λαού.* Translated by Pelos Katselis. Athina-Giannina: Ekdoseis Dodoni.

Latour, Bruno. 1987. *Science in Action*. Cambridge: Harvard University Press.

Latour, Bruno. 1984. *Pasteurization of France*. Translated by Alan Sheridan and John Law. Cambridge: Harvard University Press.

Lunacharsky, Anatol. 2000 (1934). *Ibsen*. Translated by Sally Ryan. Accessed June 30, 2014. https://www.marxists.org/archive/lunachar/works/ibsen.htm

Plekhanov, Gregory. V. 1937 (1891). *Ibsen, Petty Bourgeois Revolutionist*. Translated by Emily Kent, Lola Sachs and Pearl Waskow. Accessed June 30, 2014. http://www.marxists.org/archive/plekhanov/1908/xx/ibsen.htm

Stanislavski, Constantin. 1952. *My Life in Art*. New York: Routledge. http://books.google.gr/books?id=3swGnIbG7KUC&pg=PP5&hl=el&source=gbs_selected_pages&cad=3#v=onepage&q&f=false

Van Laan, T.F. 1986. "Generic Complexity in Ibsen's 'An Enemy of the People'." *Comparative Drama* 20(2): 95–114.

Whitney, Martin P. 1924. "The Doctor on the Stage." *The North American Review* 220(824): 147–153.

EXPLORING APHASIA: SAMUEL BECKETT'S LATE TEXTS

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Beckett's literary minimalism has for long been associated with what in French is called *mal*; this *mal* summarizing what is considered to be a decline of normality, for instance physical or mental disease, ontological discomfort, decay. However, subsequently to the shift which over the past decades (namely since the late '70s) marked the field of Beckett studies, deprivation, as the trait *par excellence* of the Beckettian subject is hence dissociated from humanistic and/or existentialist interpretations.[1] Instead, theory tends to see in the Beckettian canon the modern *enjeu* along with an early post-structuralist thought. It is within the modern discourse that this paper inscribes the words uttered by a deromanticised subject. Our aim is not to argue that the Beckettian figures[2] pronounce an aphasic speech, although the words they utter definitely bear resemblances to different types of aphasic disorder. It is rather to examine how the erratic use of language – the *domaine de prédilection* of Beckett's writing – bears the mark of modernism, the latter sharing a considerable amount of traits with aphasia without being merely aphasic itself.

Before undertaking the function language is called to fulfill in modernity, some remarks on aphasia seem in order.

1. According to Theodor Adorno (1961) Beckett stands at a considerable distance from existentialism although there is some common ground between the two. He argues that for Beckett the absurd is not an existential state of being. In his work, absurd is liberated from the dogmatism essential to the existentialist consideration of the world. Beckett rejects the existentialist conformism residing in the idea that one ought to be what one is. In existentialism, drama has no metaphysical meaning; it becomes a fertile field so as a specific worldview can be exposed. According to Adorno, Beckett sets a trap for this function by being opposed to the existentialist illusion of unity of the subject as well as to its ability to create its very own meaning each time one has to confront the metaphysical absence of meaning. In other words, Beckett's dramatic work is a parody of existentialist doctrine. Furthermore, Adorno argues that for Beckett the question of interpretation means to affirm the incomprehensible nature of his work. However, Adorno's reading of *Endgame* as a representation of the world after the Holocaust stands as a proof of the difficulty to overstep interpretation.
2. Figure as opposed to a well defined and solidly 'built' dramatic or novelistic character whose primacy in literature declined along with the 19th century.

On aphasic disorder

The term aphasia has been anything but uni vocal. It was introduced in 1864, three years after the French physician, anatomist and anthropologist Paul Broca performed autopsy on a patient named Leborgne, called Tan Tan after the speech automatism he developed subsequent to a frontal brain lesion. The patient had good comprehension but almost no speech apart from the speech automatisms *tan tan* and *sacré nom de Dieu.* Broca called this disorder 'aphemia', meaning loss of articulate speech, a term that is still in use although now the term 'apraxia' of speech is preferred. A year later, Broca formulated his famous sentence "we speak with the left hemisphere" (1865, 384). However, Broca's findings assisted by German anatomist and neuropathologist Carl Wernicke's further examination of the posterior brain (Wernicke 1874) argued that aphasia is a memory disorder, maintaining in that way a thesis whose origins trace back in the 15th century.

The term 'aphasia' is attributed to the French physician Armand Trousseau. Trousseau justified his choice of aphasia over aphemia (Trusseau 1864, 13-14, 25-26, 37-39, 48-50) by pointing out that the difference does not reside in the loss of or incapacity for speech but instead in the loss of or incapacity for language, shedding light on aphasia "as a cognitive rather than a memory disorder that affects intellectual performance" (Code 2012, 9).

During the 19th century, studies on aphasia proliferated. Yet, the argument of aphasia's – as speechlessness – relation to loss of memory for words was not abandoned. The French neurologist Albert Pitres for instance attempted to establish amnesic aphasia as an independent form of aphasia which consists in "having forgotten the words that are necessary in order to express thoughts" (Benton 1988, 210).

However, the 20th century and the birth of linguistics proposed a far more profound approach according to which aphasia is not a word retrieval problem but an inability to build sentences; it is therefore situated before the search for words. Roman Jakobson formulated a regression hypothesis according to which we can observe the same processes both in developing child speech and in the impairments of aphasic speakers, but in reverse. We have recourse to Jakobson's categorization in order to understand and recognize the symptomatic expressions of aphasia.

Based on the data of the German physicist Eugen Goldstein, Jakobson distinguishes two types of aphasic disorder – namely similarity and contiguity disorders: in the first type, the major deficiency lies in selection and substitution, while in the other it lies in combination and contexture. In the first type "the content is the indispensable and decisive factor" (Jakobson [1971] 1998, 123).

In terms of linguistic competence this is translated as follows: "the more the utterances are dependent on the context, the better the patient copes with his verbal task" (Jakobson [1971] 1998, 124). Patients with this type of disorder tend to take words literally,

meaning that they can perfectly understand a specific word within a phrase but not when found alone. For them, words are semantically lost when out of context. This impairment drives to the failure of metalanguage through the poor choice of synonyms and the general incapacity to understand words as single linguistic entities. Another consequence of the similarity disorder is the failure to perceive different tones and dialects. As Jakobson ([1971] 1998, 124) points out, aphasics no longer possess the capacity for code switching. This difficulty in understanding confines them in an idiolect they take as "the sole linguistic reality" (Jakobson [1971] 1998, 124). Within this linguistic reality of their own they are perfectly at ease with reactive speech (i.e. they are able to reply to a real or imaginary addresser) and even though they cannot start a conversation, they have no difficulty at all in carrying it on. One last remark as corollary of all the above: incapable as such patients are to start a conversation, they tend to omit the first words of their phrase, frequently the subject covering their utterances with abstraction.

Briefly, in similarity disorder language maintains the capacity to name only within a specific content. In any other case such patients affirm that they can hear the voice but not the words. Based on this statement, one could say that words lose their semantic function and become undecipherable signs.

In the contiguity disorder, the ability to combine linguistic units in order to form phrases, utterances and so on is seriously compromised. The work of the British neurologist Hughlings Jackson has been significant to the modern study of language. One of his key arguments is that it is not enough to understand words; one should be in the position to make the right combinations so that words refer to one another in a particular manner. Without a proper interrelation of its parts, a verbal utterance would be a mere succession of names embodying no proposition. Based on this, he stated the position that "speechlessness does not mean entire wordlessness" (Jackson [1879] 1994, 152), meaning that impairment of the ability to combine linguistic entities into complex units does not result in the loss of words but in the loss of coherent speech. The phrase organization which derives from such a deficiency is characterized by elliptical phrases, chaotic word order, telegraphic speech, one-word sentences and is also known as 'agrammatism'. In contrast to aphasics suffering from a similarity disorder, words that are not obviously related to the context are more bound to resist. Such is the case of "the subject word". In a next stage, the ability to combine the right constituents in order to build words, decline verbs or choose the correct one between words sharing the same root is equally compromised. In some cases, the aphasic cannot resolve a word into its phonemic constituents, therefore he cannot control and reproduce the construction of the word which results in poor combination of phonemes. This regression is the opposite of the development of speech in children. In extreme cases, this leads to dispossession of language, to the return to a prelingual stage, to *aphasia universalis*.

If in similarity disorder the patient is familiar with sounds but they do not refer to a specific word, here the "words are grasped as known but they are not understood"

(Jakobson [1971] 1998, 128). In both cases, language loses its transparency as well as the capacity to name and becomes an opaque web of blurred references.

Beckett and the words

Beckett's writing is not unfamiliar with phenomena as the ones described above. The long series of the characters' impairments and aberrations includes almost always speech impediments; along with physical and mental debility they present a significant aspect of the subject's increasing difficulty to find his proper place within the surrounding world, of his incapacity of self-definition and self-description as well as of the indifference to provide for himself coherent data affirming in this way a firm identity.

In *The Trilogy* (1951-1953), this *cercle romanesque* pivotal to the Beckettian canon in terms of problematics, evolution of writing process, development of a proper style and treatment of the subject, each and every male figure experiences various symptoms of neurological, motional, memory and sensory infirmity, the result of which is a subject with distorted perception and no clear image of himself. One of the main themes in all three novels – in the present study we will confine ourselves to drawing some examples from the first one, *Molloy* (1951) – is vagrancy. An increasing degree of abstraction covers their 'journeys'. Molloy is introduced as somebody who once set off on a journey in order to visit his mother in a city the name of which never comes up. He ends up in his mother's room without being able to recall how he got there. "I'm in my mother's room. It's I who live there now. I don't know how I got there. Perhaps in an ambulance, certainly a vehicle of some kind" (Beckett [1951] 1955, 7). The initial goal to achieve does not protect the person who conducts the research. Molloy progressively succumbs to body stiffness while at some point he is affected by a memory disorder close to amnesic aphasia. He finds himself unable to move as unable he is to remember the name of the city towards which he is heading, the goal of his journey in general, his name, his identity, past events – "But I was used [...] to not knowing where I was going, what I was leaving, what was going with me, all things turning and twisting confusedly about me" (Beckett [1951] 1955, 15). Furthermore, his mother's room is confused with a health institution where he stays for an indefinite period of time. Neither does he wonder about the (sudden?) turn in his life nor is he in any position to provide pertinent answers about his identity and his incapacity to recall past events.

The second part of the novel evolves in a similar way. Moran undertakes the obligation to find Molloy but soon finds himself unable to move as his predecessor. Molloy's phrase equally applies to his condition. "My sense of identity is wrapped in a namelessness often hard to penetrate" (Beckett [1951] 1955, 12). The isolation and silence around him could equally evoke a mental institution where he is under medical observation as Molloy and where both are asked to provide a written report of their research. He who

commands the report is vaguely referred to in the third person: "There's this man who comes every week [...] He gives me money and takes away the pages [...] Yes, I work now, a little like I used to, except that I don't know how to work any more" (Beckett [1951] 1955, 7). The report as a testimony, as an attempt to bring truthfulness and motivation to their wandering fails since their writing is structured in the same way as their speech. Peculiar use of words, erratic syntax, phrases structured in a spiral way so as to occlude signification and lead to endless repetitions, taking each time words a little bit further, without producing any kind of coherent meaning whatsoever.

Many hypotheses have been formulated about the reasons behind the vagueness enveloping their identities. One of them treats the errant subject as suffering from ambulatory automatism

> a disorder that appears almost solely to have affected men and of which an entire epidemic broke out in France between 1887 and 1909 (Maude 2009, 88)

In 1891 the physician André Pitres described the malady as follows:

> By the term ambulatory automatism is understood a pathological syndrome appearing in the form of intermittent attacks during which the patient, carried away by irresistible impulse, leaves his home and makes an excursion or journey justified by no reasonable motive. The attack ended, the subject unexpectedly finds himself on an unknown road or in a strange town. Swearing by all the gods never again to quit his penates, he returns home but sooner or later a new attack provokes a new escapade (Hacking [1996] 2004, 125).

Almost a century later, the American Psychiatric Association listed "confusion about personal identity or assumption of new identity (partial or complete)" along with "dissociative amnesia" (Hacking [1996] 2004, 127) among the symptoms of the disorder, now termed "dissociative fugue". Ambulatory automatism is certainly a disorder of personal identity; for Ian Hacking it is linked to amnesia, multiple personality and hysteria; it is namely the "male expression of hysteria" ([1996] 2004, 129).

The description seems to match Molloy's and Moran's wandering and allows us to replace the word journey with fugue, since the fist implicates a destination, while vagrancy problematizes "goal-oriented intentionality" (Maude 2009, 88).[3] Hacking places ambulatory automatism under the dominance of modernity and considers it to be "an extreme case of modern malady" ([1996] 2004, 126), modern being used in chronological as well as in social terms and being therefore linked to bourgeois. The social and technical conditions of the late 19th century were favorable to the emergence of such

3. Hacking ([1996] 2004, 132) stresses out that the patients could not remember where they traveled even though they behaved quite normally while on the road.

phenomena and it is these same circumstances that justify why women were not attacked by ambulatory automatism.[4]

Even if one finds it restrictive to place the novelistic figures under a specific clinical diagnosis, the fact remains: the abstraction of their identity poses serious doubts about their ontological status. As we will see later on, poor memory cannot really be held accountable for the absence of those facts that bureaucrats use to identify us with.

In Beckett's second published novel in English, *Watt* (1953), the main male figure is an equally eloquent example of a rapidly dilapidating subject. In symbolic terms, three major moments in the novel, that is Watt's journey to Mr. Knott's domain, whom he serves for an undefined period of time, the twenty-five pages long speech of Arsene, the departing servant, finally Watt's hospitalization in the asylum, are in a way suggestive of the withdrawal from naturalistic reality in order to penetrate a surreal landscape, largely marked by the abandonment of the mastery of the subject over language. Watt speaks both rapidly and surprisingly low

> with scant regard for grammar, for syntax, for pronunciation, and very likely, if the truth were known, for spelling too, as these are generally received [...] Watt spoke as one speaking dictation, or reciting, parrot-like, a text, by long repetition become familiar (Beckett [1953] 1976, 154).

As in *Molloy*, words are no longer arranged so as to produce meaning. This shift in language use gives way to speech as a system the inner structure of which challenges comprehension and makes the following question inevitable: on what principles are combinations based if not upon semantic, syntactic and grammatical ones?

G. Deleuze considers *Watt* to be "the great serial novel, where Mr. Knott, with no other need than to be without need, does not reserve any combination for a singular use that would exclude others – whose circumstances are yet to come" ([1992] 1995, 4). To the capacity of language to enunciate possibilities, Deleuze juxtaposes the art of exhaustion which becomes the Beckettian territory *par excellence*. According to Deleuze, in order to realize the possible and produce meaning, one "always proceeds through exclusion, because it presupposes preferences and goals that vary, forever replacing predecessors" ([1992] 1995, 3). Under the sovereignty of exhaustion, combination renounces signification, preferences or organization in favor of goal achievement. Here, the disjunction is not exclusive but *inclusive*, meaning that everything is divided but within itself; combinations are perpetuated for their own sake. What is at first difficult to perceive – that is what makes one word stand next to the other – is "the art of combinations" (*la combinatoire* [1992] 1995, 4) and the point towards which series based on an

4. Hacking evokes social conventions among which the danger for females traveling alone. He also suggests that medical diagnoses functioned as a mechanism that facilitated categorizations, while epidemics served as a pretext for control and repression.

inexhaustible number of combinations tend is exhaustion, since no need, no preference, no signification is recognized as such. Laura Salisbury underlines that "words assume the opacity of unreadable objects, to be circulated according to mathematical principles like Murphy's biscuits or Molloy's famous sucking stones" (2008, 103). Two well-known scenes from *Molloy* and *Murphy* (1938) respectively can be seen as an eloquent example of combinatorics. One of Molloy's favorite occupations is to suck the stones he carries in all four pockets of his coat and trousers in a way that they are all equally and successively sucked and that the number in every pocket is the same as in the other three:

> I had say sixteen stones, four in each of my four pockets these being the two pockets of my trousers and the two pockets of my greatcoat. Taking a stone from the right pocket of my greatcoat, and putting it in my mouth, I replaced it in the right pocket of my greatcoat by a stone from the right pocket of my trousers, which I replaced by a stone from the left pocket of my trousers, which I replaced by a stone from the left pocket of my greatcoat, which I replaced by a stone which was in my mouth, as soon as I had finished sucking it. Thus, there were still four stoned in each of my four pockets, but not quite the same stones (Beckett [1951] 1955, 20).

As for Murphy, he is seriously preoccupied by his five biscuits and the hundred and twenty modes of permutability:

> Overcome by these perspectives Murphy fell forward on his face in the grass, beside those biscuits of which it could be said as truly as of the stars, that one differed from another, but of which he could not partake in their fullness until he had learnt not to prefer any one to any other (Beckett [1938] 1973, 57)

Two points to retain come to two: the total absence of goal to achieve even in the broader sense as well as the opposition between words' disposition in order to achieve a coherent meaning on the one hand and the idea of combinations as the result of a serious work without serving a specific semantic, syntactic or communicative goal whatsoever on the other. These points are examined in their eventual relation to aphasic disorder.

According to the testimonies of aphasic patients any systematic attempt to write down their symptoms as well as what they recall of their fragmented past and present is seen as a remedy. In his study *The Man with a Shuttered World* (1971), the Soviet neuropsychologist Alexander Luria presents the story of a soldier named L.S. Zasetsky who suffered from severe brain damage after he was shot in the head during the Second World War. The soldier held a journal of recovery revealing both the way aphasia affects linguistic and comprehensive abilities and the internal landscape of the patients.

> The injured soldier feels himself to be nothing but a disconnected collection of body parts in a world of spatial peculiarities and discontinuous memory flashes (Salisbury 2008, 80).

Writing, as Luria puts it, enables Zasetsky "to assemble the bits and pieces of his past, compare and arrange them into episodes, create a coherent view of what his experience and desires were" (Luria [1971] 1973, 84). According to the soldier himself:

> By working on that story of mine every day [...] I hoped to be able to tell people about my illness and overcome it [...] This writing is my only way of thinking. If I shut these notebooks and give it up, I'll be right back in the 'know-nothing' world of emptiness and amnesia" (Luria [1971] 1973, 85-6).

For Luria and Zasetsky, language is pivotal to cognition. By re appropriating and repossessing the language, the aphasic constructs a way of being; he reconnects with his former self, ensures for himself a world of stability, a personal history.

Aphasics proceed to a holistic reshaping of language so as to reconnect with their proper experiences. The Beckettian subject seems rather to observe with lucidity that the relation between he who talks and language is all but evident and that language has a strong material nature hard to overcome. While in the aphasics' texts there is a burning desire to overcome the disease and regain normality, the Beckettian subject is far more sober, although the symptoms of loss of identity are not less manifest. The fact that he is not deprived of words does not mean that language maintains anything more than the reminiscence of its former communicative function. Molloy holds the long time spent away from words (Beckett [1951] 1955, 12) responsible for his poor memory but at the same time words do not seem to offer him a safe refuge. He constantly undermines their capacity to provide reliable information about himself and/or the world that surrounds him. He affirms "all I know is what the words know" (Beckett [1951] 1955, 12) before he abandons himself to infinite hypotheses of what he is or could have been with no obvious concern to build an identity or get in touch with his former self. Briefly, the logorrheic speech he performs is clearly not a remedy. Deleuze argues that Beckett is a writer whose linguistic stammers, exclusive permutations and dynamic combinations ensure that

> (e)very word is divided, but into itself [...]; and every word is combined, but with itself [...] Creative stuttering is what makes language grow from the middle, like grass ([1993] 1998, 111).

If Zasetsky's primal concern was to fight against the know-nothing, this state of being does not intimidate Molloy. For him, to remember is not better than to forget – "I forget who I am" (Beckett [1951] 1955, 13-4). One of the final remarks Moran makes on his current condition is about his "growing resignation to being dispossessed of self" (Beckett [1951] 1955, 38). What is the meaning of this phrase haunting Beckett's texts, expressed more or less openly? What does anyone who speaks try to achieve? Is language out of his control? Has he no power over the words that come out of his mouth? Before reaching the inevitable point where words sound "like difficult music heard for the

first time" (Beckett [1938] 1973, 27), they form infinite stories, abandoned for the sake of new ones as doubtful as the previous and/or the next ones. In *Krapp's last tape* (1958) for instance, the reader becomes the witness of the rise of a plural identity, in the sense that all attempts to 'find out' who he is by having recourse to his past end up to his not recalling but rather becoming the witness of his non identification with himself. Molloy affirms the contingent nature of all identities by pointing out perspicaciously that language is no longer capable to name and represent: to speak means to invent (Beckett [1951] 1955, 7, 12, 19).

In his 1966 essay on Maurice Blanchot, Michel Foucault underlines the danger of such an action as follows: by inventing, one risks to maintain basic structures which under the cover of invention weave again the web of interiority; he continues by stating that to invent a way of being is to try to retrieve what you have been, to try to perpetuate a transferred subjectivity. Molloy makes sure to get around this obstacle: for him words are pure sounds: "Yes, the words I heard, and heard distinctly, having quite a sensitive ear, were heard a first time, then a second, and often even a third, as pure sounds, free of all meaning, and this is probably one of the reasons why conversation was unspeakably painful to me" (Beckett [1951] 1955, 16). All the questions asked about what senses fail to perceive, the aporia of the Beckettian subject proves to be misleading. The questions do not call for answers, they are not meant to reconstruct the broken channels of communication with humanity and subjectivity.

Beckett gradually moves away from the idea of a plural identity and variations of self in favour of a kind of writing which gives way to the materiality of language which has lost interest in maintaining or achieving unity; instead it moves towards the intensification of discontinuities.

Beckett and the modern discourse

In *Discourse Networks* (1985) Friedrich Kittler views language as a domain recalcitrant to internalization, as a territory the subject has been banned from. Kittler delimits his subject and

> concertizes his theme by situating his analysis [...] at the level of the historically specific machineries – scriptural and otherwise – that in their various arrangements organize information processing ([1985] 1989, xii-xiii).

One of Kittler's major methodological concerns is "to generalize the concept of medium, to apply it to all domains of cultural exchange" ([1985] 1989, xiii). According to this consideration, literature is a *means* for the processing, storage and transmission of data and as all means it implies noise and nonsense. The idea of literature as medially constituted is fundamental in order to perceive literature in its relation to non meaning.

The idea of mediality leaves out any anthropological conception of man. Man, namely the body arises as the locus of inscription of pathological symptoms.

The notion of inscription itself is fundamental to the 1900 discourse, that is to the discourse of Modernism.[5] The 1800 discourse, that is the discourse of Romanticism, was largely characterized by the primacy of the subject and the autonomy of art in its sublimation. Language was supposed to function as a transparent representation of the transcendent inwardness of the soul. It was an era of the conviction that there is an origin to the words we utter, and this origin can be traced back to books or nature. It was also an era of strong belief in orality as a means to transfer data and in the writing hand as a means to store information on paper. Kittler stresses out how the invention of new technical means – that is typewriter (the first one was commercially sold in 1870), phonograph (1857) and film camera (1888) – also changed our conception of language via the new ways to produce, transfer and decipher speech that they suggest. This procedure is not consequence-free as far as production of meaning is concerned. Registration loses the directness of the written word and makes room for random incidents and noise to be registered as well. The new technical devices assure accuracy not as far as the mouth/soul to paper transfer is concerned but in the sense that they are capable to register promiscuously anything within their range.

In the foreword to the American edition, David E. Wellbery gives the example of Franz Kafka's protagonist-letter K.[6] which in his attempt to call the castle hears noise in the telephone lines. "It is (technically, not metaphorically speaking) the noise of modernism" ([1985] 1989, xxviii). In terms of 1800 discourse this noise would occlude meaning and would require interpretation. In 1900 discourse terms, language tends to stop making sense. According to Kittler, the studies on aphasia shed light on the new relation between language and production of meaning. In aphasia, a word is a nonsense word when it escapes the signifier-signified junction. It is therefore a word without stable reference or intention. In modernism, the nonsense word appears not as a symptom of a dysfunctioning brain but rather as a product of a new conception and organization of language. All words can be nonsense words since no combination of phonemes is prohibited, since any signifier-signified relation – pathological or non-pathological – is considered to be purely conventional.

Kittler holds psychophysics to be particularly important in order to understand how language reaches a point where it simply stops making sense. He makes special reference to the experiments the German psychologist Hermann Ebbinghaus conducted on himself between 1879 and 1880 and again between 1883 and 1884 in order to measure memory. His experiments consisted in series of syllables passing in front of his eyes,

5. Discourse refers not to speech in general but to different modes of existence of language as shaped by strategies of interpretation, means of reproduction, storage, transfer etc.

6. In the 1926 novel *Das Schloss (The Castle).*

formed and combined randomly. The syllables had absolutely no meaning. His task was to calculate how many times he had to see a series before being able to memorize it. He came to the conclusion that a series of 7 syllables could be learnt by heart instantly, ones of 12 syllables after 16 times, while series of 22 syllables only after 55 times (Kittler [1985] 1989, 209]. To his big surprise his task was no easier when he tried to repeat the experiments with syllables that actually meant something, namely cantos from Byron's *Don Juan*: "From this point of view it also seems as if the difference between sense and nonsense material were not nearly so great as one would be inclined a priori to imagine" (Kittler [1985] 1989, 209). Kittler concludes that the experiments proved "that nothing, but nothing means anything" ([1985] 1989, 208).

These experiments inscribe the origins of speech in pure randomness. The body is divested of personal history or/and cultural references. It has a very specific task to accomplish where there is no room for personal implication. As far as the nature of syllables is concerned, their origin does not trace back to books or to the Mother's voice but to the art of combinations, and the mathematical, -yet not semantic-, principles that determine them, just like in the case of Molloy's stones and Murphy's biscuits. The syllables come out of a device where they are stored at the end of the experiment. Speech produced in that way is semantically incoherent, yet indicative of the (non) relation between the talking subject and the words he utters.

In Beckett's theatre, the stage, sunk in the dark, illustrates this idea perfectly. His late plays – his *dramaticules* – put almost always the idea of unity in question. The evanescent figures that rise from the darkness and are equally engulfed in it struggle with a language they are no longer possess. They are often 'assisted' by something – mechanical device for speech reproduction[7] – or somebody – a reader, a silent presence – who is supposed to feed the dialogue but who actually stresses out the figure's increasing degree of withdrawal from words. From this point of view, the individual, left without references in a landscape where "word becomes an opaque mass that clouds the appearance of meaning" (Salisbury 2008, 82) is somehow close to the aphasic patient. Their difference resides in the fact that the patient wishes to reverse his current condition, while for Beckett such an option is illusory.

This is the situation in *Not I* (1972). A feminine voice comes out of a lit mouth surrounded by darkness:

> Stage in darkness but for MOUTH, upstage audience right, about 8 feet above stage level, faintly lit from close-up and below, rest of face in shadow (Beckett [1972] 1986, 376).

7. For instance, *That Time* (1975) and *Rockaby* (1982) in *Collected Shorter Plays.*

There is a total absence of any mark of corporality that would put the reader or the spectator in the temptation to make the voice he hears and the body he is free to imagine coincide. One could sum up the story as follows:

The short, elliptical phrases placed between ellipsis points in the written version and subsequently left to hang when pronounced on stage recount vaguely the story of a woman who regains speech:

> when suddenly she realized… words were– …what?… who?…no!…she!…[…] realized… words were coming… imagine!… words were coming… a voice she did not recognize… (Beckett [1972] 1986, 379).

However, she fails to identity the voice as her own, maintaining a surprising degree of lucidity as far as who she is supposed to be herself is concerned. She states from the very beginning that "not only had she… to give up… admits her alone… her voice alone" (Beckett [1972] 1986, 379) furthermore, she fails to identify with the content of the words she utters "can't go on… all this… all that… steady stream… straining to hear… make something out of it… and her own thoughts… make something of them…" (Beckett [1972] 1986, 380) as she fails to see any meaning in them. The sounds are equally unfamiliar to 'her' ears: "certain vowel sounds… she had not heard… elsewhere" (Beckett [1972] 1986, 379). Speech is perceived as an incoherent flux: and now this stream… steady stream […] and now this stream… not catching the half of it… not the quarter… no idea… what she was saying… imagine! […] mouth on fire […] just the mouth… like maddened… and can't stop… no stopping it…" (Beckett [1972] 1986, 379-81). Every single sound that reaches her ears is a buzz: "the buzzing?… yes…all dead still but for the buzzing […] what?… the buzzing?… yes… all the time the buzzing…" (Beckett [1972] 1986, 379-81).

The question which emerges from the difficulty to define him who speaks and the reduction of the mouth to a speech transmitter[8] is what constitutes the 'I' and that which is the nature of the first person. The title itself should be taken literally. The story is not about a woman; this is not the nostalgic reminiscence of a wasted, yet well organized past but the verbal wandering in a world of broken identities and discontinuities. The mouth becomes a speaking machine dissociated from the rest of the body. The use of the first person is proved to be purely conventional. The subject like the words is slipping away, is never present in the 'I' it pronounces. Anthony Uhlmann ([1999] 2008, 165) comes to the conclusion that any effort the Beckettian subject makes in order "to say 'I' and mean

8. Beckett's preoccupation with speech reproductions dated back to his first play for radio under the title *All that fall* (1956). Ever since, tape recorder has often accompanied the actor on stage. This vitality of human speech voice, technically reproduced and stayed 'alive' thanks to the medium, is to be treated not quite in its complementary but rather in its opposing part to the presence; that means that it serves as a pretext in order to maintain the dialogue on stage but under no circumstances does it maintain a discourse on the subject. The voice is not an inner monologue the task of which is to make the figure on stage remember; what the voice actually does is underline the distance between the figure and the first-person narration.

himself is destined to fail". As for Chris Code (1989, 161), he notes that the most common word in the/his table of 'real world speech automatisms' is 'I'. Even what might once have been thought of as a master signifier of the intending subject can now become an alibi of the potential dislocation that haunts all acts of signification. It is rather the language speaking not the person, liberated from all kinds of intentionality. This is the point the first person narration rejects "the transcendental pretensions of the authority of the signature" (Katz 1999, 9) and Beckett meets the Blanchottian *neutre*, the eradication of the 'I' so as to give rise to the materiality of language. According to Foucault (1966) language gives rise to a figure, which is actually less than a figure; it is actually a kind of an obstinate, a shapeless anonymity. Hereafter, all speech is essentially unfamiliar to the subject. To speak is to be absent from the act of speaking, it is to be eternally excluded from it. What we hear in *Not I* is a pure voice, what Blanchot calls *une voix blanche*, it is not the voice of someone, it is the voice of no one.

In Beckett's final text, a poem entitled *What is the word* (1988) a unique circumstance brought together his literary principles and lived experience. The poem is the writer's attempt to reconnect with what he was familiar with after being diagnosed with a neurological illness and while experiencing temporary aphasia. Scattered with dashes, elisions, automatisms, repetitions and cuts within words, the poem could be seen as the representation of Beckett's disease. At the same time the content of the poem is surprisingly close to former texts written with lucidity, not under the effect of rapidly dilapidating aphasia, standing as proof not of osmosis between the artist and his work but instead of sharp perception both of the *enjeu* of his times and of the essence of the human intellectual activity. With this final text Beckett comes as close as he could ever get to the end of all kinds of dialogical language. This not intentional yet long prepared for end constitutes a major point of convergence between Beckett, Mallarmé and Artaud. In their work, all three re-presented the movement within which vanishes the talking subject. Stephane Mallarmé conceived poetry as the infinite numbers of combinations that the twenty-six letters of the alphabet produce. His monumental *Livre* (1957)[9] would exploit the possibilities of letters, phonemes and words combinations making poetry a question of letters disposition on paper not of ideas. As for the artaudian step, the inevitable issue to all language is the violence of the body and the violence of the cry, the abandonment of the voluble inwardness of the consciousness in favour of materiality, of affliction of the flesh and expulsion of the individual.

9. *Le 'Livre' de Mallarme. Premières recherches sur les documents inédits*. Scherer, J. (ed.), Paris: Gallimard.

References

Adorno, Theodor. 1961. "Versuch, das Endspiel zu verstehen." In *Noten zur Literatur II ,* 188-236. Berlin and Frankfurt am Main: Suhrkamp.

Beckett, Samuel. 1953 *Watt.* Paris: The Olympia Press.

Beckett, Samuel. 1955. *Molloy.* New York: Grove Press.

Beckett, Samuel. 1973. *Murphy.* London: Picador.

Beckett, Samuel. 1986. "Not I." In *The Complete Dramatic Works.* London: Faber and Faber.

Benton, Arthur. L. 1988. "Pitres and Amnesic Aphasia." *Aphasiology* 2: 209-14.

Broca, Paul. 1865. "Sur le siège de la faculté du langage articulé." *Bulletin Sociologique et Anthropologique* (6): 337-93.

Code, Chris. 2012. "Significant landmarks in the history of aphasia and its therapy." In *Aphasia and related neurogenic language disorders* edited by Ilias Papathanasiou, Patrick Coppens and Constantin Potagas*,* 3-22*.* Burlington, MA: Jones & Barlett Learning.

Deleuze, Gilles. 1995. "The Exhausted". Translated by Anthony Uhlmann. *SubStance* 24 (78): 3-28.

Deleuze, Gilles. 1998. "He Stuttered." In *Essays Critical and Clinical* translated by Daniel Smith, and Michael Greco, 163-99. London: Verso.

Foucault, Michel. 1966. "La pensée du dehors." *Critique* 229: 523-46.

Hacking, Ian. 2004. "Automatisme Ambulatoire: Fugue, Hysteria and Gender at the Turn of the Century." In *The mind of modernism: Medicine, Psychology and the Cultural Arts in Europe and America, 1880-1940* edited by Marc S. Micale, 125-138. California: Stanford University Press.

Hughlings, Jackson J. 1994. "On affections of Speech from Disease of the Brain." In *Reader in the History of Aphasia* edited by Eling, Paul, 145-67. Amsterdam: John Benjamins.

Jakobson, Roman. 1998. "Two Aspects of Language and Two Types of Aphasic Disturbances." In *On Language* edited by Linda Waugh and Monique Monville-Burston, 115-33. Cambridge, Massachusetts, London: Harvard University Press.

Kittler, Friedrich. 1990. *Discourse Networks 1800/1900.* Translated by Michael Metteer and Chris Cullens. California: Stanford University Press.

Luria, Aleksandr. 1973. *Poteriannyi i vozvrashchennyî mir (The Man With the Shuttered World: History of a Brain Wound).* London: Cape.

Maude, Ulrika. 2009. *Beckett, Technology and the Body.* Cambridge/ New York: Cambridge University Press.

Salisbury, Laura. 2008. "What is the word': Beckett's Aphasic Modernism." *Journal of Beckett Studies* 17(1-2): 78-126.

Uhlmann, Anthony. 2008. *Beckett and Post-Structuralism.* Cambridge/ New York: Cambridge University Press.

ON WHAT MATTERS FOR AFRICAN AMERICANS: W. E. B. DU BOIS'S *THE SOULS OF THE BLACK FOLK* IN THE LIGHT OF DEREK PARFIT'S *REASONS AND PERSONS*

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In *Reasons and Persons* (1984), the greatest contribution to utilitarian philosophy since Henry Sidgwick's *The Methods of Ethics* (1874), Derek Parfit (1942–) supports his Reductionist contention "*that personal identity is not what matters*" by turning to the neurosurgical findings of Roger Wolcott Sperry (1913–94) (Sperry 1965, 298-313; Parfit 1984, 255). As Hixson Professor of Psychobiology at CalTech, Sperry pioneered an operation that severed the corpus callosum, which comprises the bundle of nerve fibers between the upper brain hemispheres, of patients with acute epilepsy. This procedure, which ameliorated but did not cure the sufferers' symptoms, produced an unanticipated side effect: "everything we have seen so far," reported Sperry, "indicates that the surgery has left these people with two separate minds, that is, two separate spheres of consciousness" (Sperry 1965, 299). Parfit appropriates this unexpected consequence as "striking evidence in favour of the Reductionist View" (Parfit 1984, 245). Personal identity, reiterates Parfit, is not what matters; "*what matters is Relation R*: psychological connectedness and/or continuity" (Parfit 1984, 215; emphasis in original), where "*psychological connectedness* is the holding of particular direct psychological connections," and "*psychological continuity* is the holding of overlapping chains of *strong* connectedness" (Parfit 1984, 206; emphasis in original). This perspective remains controversial, as Parfit readily admits but also rationalizes, because humans are "naturally inclined" (Parfit 1984, 217) to believe that individuals "*are separately existing entities*" (Parfit 1984, 210; emphasis in original) owing to some deep further fact, such as the Cartesian Ego or the Soul.

In the face of this natural inclination, Parfit tests the elements of Relation R against the criteria of logical necessity and sufficiency in a series of thought experiments. Some philosophers dismiss the usefulness of such trials; "this," concedes Parfit, "would have been [Ludwig] Wittgenstein's view" (Parfit 1984, 200). Unlike Wittgenstein, Parfit carefully distinguishes between two types of thought experiment: while one sort is "*deeply* impossible," the other sort is "*merely technically* impossible" (Parfit 1984, 219; emphasis in original). Parfit, who never resorts to deeply impossible scenarios, illustrates a valid thought experiment with reference to the Einsteinian observer who wonders "what he would see if he could travel beside some beam of light at the speed of light" (Parfit 1984,

219). Parfit's own merely technically impossible scenarios include teletransportation, body-brain replication, and brains with "no single state of awareness" (Parfit 1984, 250). A rigorous interrogation of these thought experiments demonstrates that Relation R meets the criteria of logical necessity and sufficiency; as a result, Relation R applies not only "to all people, at all times" (Parfit 1984, 273), but also to separate spheres of consciousness within a single brain.

When applied to African-American literature, the implications of Parfit's contentions are significant, with this importance gaining additional weight from the reciprocal inferences resulting from that application. An analysis of W. E. B. Du Bois's (1868–1963) *The Souls of Black Folk*, which A. C. McClurg first published in 1903, brings these bidirectional relays to light. For, "the problem of the Twentieth Century," as Du Bois insists, "is the problem of the colour-line" (Du Bois 1903, 357-548, quotation on 359). Employing the factual adequacy of autobiography to support this claim, Du Bois understands the personal realization of African-American racial identity to stem from the initial enforcement of the colour line, an imposition that splits a unified mind into two streams of consciousness. Du Bois had met the notion of a stream of consciousness when studying under William James (1842–1910) at Harvard University (1888–90). "I became," recalls Du Bois in his autobiography, "a devoted follower of James," and what Du Bois calls in "Of Our Spiritual Strivings," chapter 1 of *The Souls of Black Folk*, "the peculiar sensation" of "double-consciousness" (Du Bois 1903, 364) derives from the psychological watershed of realizing one's racial identity (Du Bois 1968, 133).

After this divisive event, and as Parfit states of Sperry's postoperative patients, "each of these two streams separately displays unity of consciousness," and although "this may be a surprising fact," as Parfit acknowledges, "we can understand it. We can come to believe that a person's mental history need not be like a canal, with only one channel, but could be like a river, occasionally having separate streams" (Parfit 1984, 247). The realization of African-American identity and the postsurgical experience of Sperry's patients are of a similar traumatic magnitude. Du Bois's appeal to the spiritual—the titular invocation in *The Souls of Black Folk* and his recourse to "two souls" (Du Bois 1903, 364) when describing the "peculiar sensation" of "double-consciousness"– does not undercut this conclusion. Du Bois is naturally inclined to believe that some deep further fact accounts for personal identity; indeed, that racists often rationalize bigotry on essentialist grounds, insisting that they appeal to a racial hierarchy that is biologically determined, seems to have salted Du Bois's essentially psychological approach to race with an unnecessary (but accountable) dash of metaphysics.

Thus, as Du Bois's thesis in *The Souls of Black Folk* unambiguously posits, an African American who has newly entered into the concept of race is numerically identical but qualitatively different to the person that went before—and that difference concerns, among other phenomena, consciousness. "One might say," as Parfit suggests of someone who has had a serious accident, "'he is no longer the same person.' This is a claim

about both kinds of identity. We claim that *he*, the same [numerical] person, is *not* now the same [qualitative] person. This is not a contradiction" (Parfit 1984, 201; emphasis in original). That psychological as well as physiological trauma can split a single consciousness, as intimated by the undefined nature of the accident that alters Parfit's singular victim, is confirmed by the reciprocal inference that results from reading *The Souls of Black Folk* from a Reductionist perspective.

The watershed event productive of African-American double consciousness—an intentional incident from an American standpoint; an outwardly imposed trauma for the targeted individual—occurs almost invariable during childhood. "It is in the early days of rollicking boyhood that the revelation first bursts upon one, all in a day, as it were," relates Du Bois. "I remember well when the shadow swept across me [...] In a wee wooden schoolhouse, something put it into the boys' and girls' heads to buy gorgeous visiting-cards—ten cents a package—and exchange. The exchange was merry, till one girl, a tall newcomer, refused my card,—refused it peremptorily, with a glance" (Du Bois 1903, 363–64). Du Bois's use of the word "shadow" suggests both the prejudice with which racial politics now paints him and, by knowingly echoing "the shadows of the prison-house" from William Wordsworth's "Intimations of Immortality" (1807), the inescapability of this racist colouration.[1] The young Du Bois, expecting the reciprocal gesture he has already experienced on a number of occasions, unguardedly approaches the newcomer, but she, as Du Bois's mention of her height implies, looks down on him. Has she, one wonders, recently arrived from the unreconstructed South? The newcomer imposes a racial construction onto Du Bois, renounces him according to ideological principles, and thereby essentially misrecognizes him as her inferior. In short, her glance rejects a racial parvenu.

Notwithstanding the arrival of this oppressive shadow, and as Du Bois appreciates, his entry into the domain of race is a manifold event. Du Bois's "peculiar sensation" of "double-consciousness" is at once the negative experience of misrecognition and the contradictory experiences afforded by the sort of psychological bifurcation that he undergoes (but that Parfit can only imagine). On the positive side of psychological splitting, each of Du Bois's resultant consciousnesses enjoys psychological continuity with the single consciousness that went before, and this connection affords Du Bois both African-American and American points of view. "After the Egyptian and Indian, the Greek and Roman, the Teuton and Mongolian," writes Du Bois, "the Negro is a sort of seventh son, born with a veil, and gifted with second-sight in this American world." Psychological continuity with the single consciousness that went before provides this seventh son with psychological insights concerning his oppressors. On the negative side of psychological splitting, the

1. For Eric J. Sundquist, one of Du Bois's most erudite critics, the Romantic influence on *The Souls of Black Folk* is paramount. "The bardic function[s] of epic and Romantic poetry, which Du Bois borrowed equally from Western cultural tradition, are the key elements that make the book the first properly theoretical document of African American culture." (Sundquist1993, 483).

process "yields him no true self-consciousness" (Du Bois 1903, 364). The imposition of the colour line establishes that demarcation as a hierarchical construct. When the tall newcomer looks down on Du Bois, she casts American consciousness above its African-American counterpart. This act of marginalization from the majoritarian context, however, cannot help but exercise the victim's African-American consciousness to the detriment of its American counterpart. That neither direct nor transitive relations exist between the consciousnesses of a racially split mind adds another degree of intricacy to this contradictory psychological state. The gap between the two consciousnesses in a previously undivided mind is not directly bridgeable. Nor can either consciousness backtrack to its unitary source and then extend that link transitively into the other consciousness. Each consciousness is aware of both a numerically unchanged life and a psychologically changed mind, but neither stream is able to access the workings of its counterpart.

That the numerically identical but qualitatively different person that results from racial miscasting continues to face that misrecognition places that person's two consciousnesses under asymmetric pressure. The African American, so often treated according to the legacy of slavery as a docile beast of burden, is no Buridan's ass. The creature of French philosopher Jean Buridan's paradox, as Parfit reminds us, "starved to death between two equally nourishing bales of hay. This ass had no reason to eat one of these bales of hay before eating the other. Being an overly-rational beast it refused to make a choice for which there was no reason" (Parfit 1984, 258). The more reasonable extrapolation from two consciousnesses under the asymmetric pressure of racial misrecognition predicts dynamic rather than static difference. "If a mind was permanently divided, and its halves developed in different ways," as Parfit muses, "it would become less plausible to claim that the case involves only one person" (Parfit 1984). In Du Bois's instance of this case, schizophrenia (Du Bois's sense of "two warring ideals" [Du Bois 1903, 364]) expresses double consciousness, with the problem of numerical unity (Du Bois's sense of "two warring ideals in one dark body" [Du Bois 1903, 364–65]) promoting the solution of passive or active suicide (Du Bois's sense of "two warring ideals in one dark body, whose dogged strength alone keeps it from being torn asunder" [Du Bois 1903, 364–65]). Owing to their mutual isolation, these two consciousnesses are equivalent to two players in a game of strategy, where the coordination condition of silence demands that each player defects or cooperates in ignorance of the other player's choice between defection and cooperation.

The "peculiar sensation" of "double-consciousness" is, then, an extremely complex phenomenon in terms of cognitive science, yet critics of African-American literature have preferred to cast Du Bois's concept in terms of social science. Typifying this approach is Paul C. Mocombe, whose *The Soul-less Souls of Black Folk* (2009) laments Du Bois's failure to "articulate the sociohistorical nature of all black practical consciousness or identity" (Mocombe 2009, 58). Mocombe argues that what he calls the "ambivalent estrangement" of which Du Bois writes concerns a particular group of African Ameri-

cans: liberals who strive for bourgeois status in a country where the bourgeoisie have effectively denied them that social standing (Mocombe 2009, 59). Mocombe's work has considerable merit, but his understanding of double consciousness amounts to a pair of social constructs contesting for the full attention of a single mind, rather than a pair of consciousnesses vying for strategic control of a single brain.

Reading this phenomenon through the analytical lens of psychological connectedness and continuity, as supplied by Parfit's utilitarian philosophy and supported by Sperry's neurosurgical findings, provides a means of addressing the general dearth of scientifically informed readings of Du Bois's "peculiar sensation." Moreover, this innovative approach highlights Du Bois's twofold desire "to attain self-conscious manhood, to merge his double self into a better and truer self," while "wish[ing] neither of the older selves to be lost." A Parfitian individual whose mental history undergoes an occasional division of consciousness into separate streams echoes this hope. Du Bois's own conceptual confusion in positing such an individual, however, suggests the unlikeliness of achieving this goal. "He would not Africanize America, for America has too much to teach the world and Africa. He would not bleach his Negro soul in a flood of white Americanism, for he knows that Negro blood has a message for the world." Du Bois "simply wishes to make it possible for a man to be both a Negro and an American, without being cursed and spit upon by his fellows, without having the doors of Opportunity closed roughly in his face" (Du Bois 1903, 365).

Du Bois's initial step toward accomplishing this deceptively (some might say "naively") simple wish is to write. The Du Boisian writing process recalls aspects of Parfit's "Physics Exam," a thought experiment, which in turn, draws on Sperry's experimental proof of the bifurcation of consciousness experienced by his postoperative patients. Richard Swinburne neatly summarizes Sperry's postoperative experiment:

> Suppose you present to one such person a tray containing miscellaneous items and ask that person to pick out those described on cards presented to them. Among the items on the tray are a key, a ring, and a key ring. You present to him the card reading "KEY RING," but in such a way that the first word "KEY" is visible only to his left visual field, and "RING" is visible only to his right visual field. He then ignores the key ring, but picks out the key with his left hand and the ring with his right hand (Swinburne 2013, 146).

In the related "Physics Exam," Parfit has

> only fifteen minutes left in which to answer the last question. It occurs to me that there are two ways of tackling this question. I am unsure which is more likely to succeed. I therefore decide to divide my mind for ten minutes, to work in each half of my mind on one of the two calculations, and then to reunite my mind to write a fair copy of the best result. (Parfit 1984, 246–47)

Parfit's thought experiment relies on ambidexterity. Each hand writes down the thoughts of its controlling stream of consciousness. "In both of my streams," maintains Parfit, "I know that I am now having thoughts and sensations in my other stream. But in each stream I am unaware of my thoughts and sensations in my other stream" (Parfit 1984, 288).

Du Bois, according to biographical record, was not ambidextrous; rather, efferent impulses resulted in ambidextrous texts that display an asymmetry in keeping with the uneven pressure exerted by racial misrecognition. Although Du Bois's writings could not help but favour the consciousness of African-American inflection, the two consciousnesses in his single brain could, as Parfit notes of his "Physics Exam," "communicate in a public way. I might in one stream write a letter to myself in my other stream. With one hand I would then place this letter in my other hand" (Parfit 1984, 288). Similarly, Du Bois's next step toward accomplishing his deceptively simple wish is to rewrite, which provides each consciousness with a retrospective appreciation of its conscious complement; each consciousness communicates in a public way with the other.

The literary provenance of *The Souls of Black Folk* traces this process at the formal level, with eight of the fourteen chapters amended from previously published articles. The bifurcation of form common to each chapter—and one of the immediately recognizable emendations to the original articles that help to construct *The Souls of Black Folk*—also testifies to Du Bois's mental negotiations. Each chapter opens with a poetic quotation followed by a musically notated excerpt from an African-American sorrow song. From the perspective of Du Bois's American stream of consciousness, the chirographic technology of reason assumes pre-eminence over the vernacular expression of thought, not only coming first on the page, but also translating an oral form into written notation. From the perspective of Du Bois's African-American stream of consciousness, the inclusion of a sorrow song, however expressed, cannot help but produce a complementary confusion of the senses: reading/singing poetry parallels hearing/reading music.

In narrative terms, Du Bois's mental negotiations come to the fore with one of the pieces written especially for *The Souls of Black Folk*, the short story that comprises chapter 13, "Of the Coming of John." Titular expectation concerns a single character, a singular John, but the narrative actually concerns two Johns, as the name of their southern birthplace, Johnstown, indicates. Du Bois's finalized tale puts the author's two consciousnesses together on the page as two separate Johns. That the African-American John Jones is the protagonist, while Jones's former American playmate John Henderson, who is the son of a local judge, plays a secondary role is a narratological asymmetry in keeping with the uneven pressure exerted by racial misrecognition: Du Bois's African-American stream of consciousness takes the lead. Before the cultural construct of race intervenes, the two Johns are numerically different but qualitatively equivalent. After that watershed event productive of African-American double consciousness, the boys are both numerically and qualitatively different. In response to his psychological

splitting, John Jones attempts to regain social equivalence, travelling out of the unreconstructed South to attend a northern university. That John Henderson concurrently attends Princeton University inadvertently places the two Johns on separate but parallel courses.

The day after John Jones's graduation witnesses Du Bois's figurative attempt to "merge his double self into a better and truer self" when the two Johns practically bump into each other at the New York Metropolitan Opera House. Suddenly aware that he has paid the princely sum of five dollars for a seat, John Jones stands "stock-still amazed," blocking the auditorium doors beyond the box office. "'Be careful', said a low voice behind him; 'you must not lynch the coloured gentleman simply because he's in your way', and a girl looked up roguishly into the eyes of her fair-haired escort." That escort, John Henderson, continues, "one never sees in the North so cordial and intimate relations between white and black as are everyday occurrences with us" in the South. When the young couple reach their seats, however, "the man [John Henderson] stopped short and flushed to the roots of his hair, for there directly beside his reserved orchestra chairs sat the Negro [John Jones] he had stumbled over in the hallway" (Du Bois 1903, 526).

The two Johns, therefore, almost end up occupying the same physical space at the opera. Du Bois's double figuration suggests that his two authorial streams of consciousness almost erode the psychological barrier between them. A reactionary understanding of identity, however, immediately dispels this suggestion. John Henderson effectively insists that the hierarchical construct of race must supplement the psychological connectedness and/or continuity of Relation R by asking an attendant to reseat John Jones. Henderson cannot countenance a near numerical equivalence that intimates a corresponding equivalence in psychological value. John Jones

> did not for some time notice the usher tapping him lightly on the shoulder and saying politely, "Will you step this way, please, sir?" A little surprised, he arose quickly at the last tap, and, turning to leave his seat, looked full into the face of the fair-haired young man. For the first time the young man recognized his dark boyhood playmate, and John knew that it was the Judge's son. The white John started, lifted his hand, and then froze into his chair; the black John smiled lightly, then grimly, and followed the usher down the aisle. The manager was sorry [...] some mistake had been made in selling the gentleman a seat already disposed of; he would refund the money, of course (Du Bois 1903, 527).

The mutually interrupted reciprocal gestures of the two Johns recapitulate the watershed event that produces African-American double consciousness. Circumambient race relations will continue to reinforce this misrecognition. John Jones both accepts and declines this inevitability: in the first instance, he immediately leaves the opera house, thereby consciously forfeiting his refund; in the second instance, he returns to

his home town, visiting "the Judge's house to ask for the privilege of teaching the Negro school" (Du Bois 1903, 531), a request the judge grants.

The hierarchical construct of race, however, almost immediately intervenes to disrupt John Jones's school teaching. "Heah that John is livenin' things up at the darky school," volunteers the postmaster to Judge Henderson one morning. "What now?" the Judge asks. To which the postmaster replies, "Oh, nothin' in particulah,—just his almighty air and uppish ways" (Du Bois 1903, 532). From a majoritarian perspective, Jones's uppishness denotes an ideological attempt to raise the stream of African-American consciousness, and such a promotion threatens to dismantle the asymmetric preeminence enjoyed by the American stream of consciousness, the preeminence first imposed on Du Bois himself during his childhood visiting-card incident. The judge closes John Jones's school. This closure, as the final events of Du Bois's tale demonstrate, leaves John Jones with a single solution to the contestations of double consciousness: the expiry of both streams. Killing John Henderson for what he interprets as Henderson's attempted rape of Jennie (Jones's sister) provokes another murder, with a mob, headed by Judge Henderson, lynching John Jones.

At this stage of his career, such a bleak solution suggests a solitary answer to Du Bois's twofold problem, but that Du Bois would finally and permanently immigrate to Ghana in 1961 implies that the psychological division created during childhood left him with a pair of irreconcilable consciousnesses, two streams of consciousness held apart under the asymmetric pressure of American state apparatuses, both ideological and repressive, which finally separated this African American from the country he had wished to make his home.

References

Du Bois, William E. B. 1903. *The Souls of Black Folk*, 1903, *Writings*: The Suppression of the African Slave-Trade, The Souls of Black Folk, Dusk of Dawn. In *Essays* edited by Nathan Huggins. New York: Library of America.

Du Bois, William E. B. 1968. *The Autobiography of W. E. B. Du Bois: A Soliloquy on Viewing My Life from the Last Decade of Its First Century.* New York: International.

Mocombe, Paul C. 2009. *The Soul-less Souls of Black Folk*. Lanham, MD: University Press of America.

Parfit, Derek. 1984. *Reasons and Persons.* Oxford, UK: Oxford University Press.

Sperry, Roger Wolcott. 1965. "Brain Bisection and Mechanisms of Consciousness." In *Brain and Conscious Experience: Study Week, September 28 to October 4, 1964, of the Pontificia Academia Scientiarum* edited by John C. Eccles. Berlin: Springer-Verlag.

Sundquist, Eric J. 1993. *To Wake the Nations: Race in the Making of American Literature.* Cambridge, MA: Harvard University Press.

Swinburne, Richard. 2013. *Mind, Brain, and Free Will.* Oxford, UK: Oxford University Press.

SCHOLARLY USES OF LITERATURE AT THE END OF THE 18TH CENTURY AND IN THE 19TH CENTURY

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In the West, the 19th century is retrospectively considered as the century of the separation of science and literature. But above all, as Stéphane Zékian's work has shown, it is the polemical moment of the emergence of learned disciplines and of their specialization (Zékian, 2011 & 2014). What seemed self-evident until then becomes problematic and the use, by a particular scientist wishing to demonstrate the scientificity of his or her studies, of tools or references that have become foreign requires a certain number of precautions.

The recourse to a form considered «literary» to present scholarly theories is not new at the end of the 18th century. But at the turn of the two centuries, it becomes the subject of increasingly fierce criticism, either from scholars who *de facto* excluded works that used it from the field of science, or from writers who excluded the same works from the field of literature. Those who practice scientific "literature" are forced to justify their practices and generally hold to other definitions of science or literature.

Literary scholars have long analyzed the presence of *corpora*, vocabularies or scholarly theories in "literary" texts. More rarely are criticisms devoted to the use, within the scholarly discourse, of tools, methods or literary works[1]. In both of these fields of research, the detour to the related sphere (through science or literature) is the way to return to the original *corpus* and discuss its meaning, or even its purpose, sometimes even defending the idea of an identity of "nature" between science and literature, or pleading for a «third» culture that would subsume the separation between the two spheres.

Our purpose here is not to distinguish between the identity, complementarity or strangeness of the two literary and scholarly spheres. This would presuppose that the definitions of "science" or "literature", which varied throughout the 19th century, should be fixed in advance. Rather, it will be a matter of observing how the dialogue between

1. However, they do exist. The two founding works in this field are undoubtedly those of Hallyn 1987 & 2004. But we also think of the work of Nicolas Wanlin 2018 and Ernst Haeckel 2018; to the works of Nathalie Vuillemin 2009 and to the works Laurence Dahan-Gaida devoted to dialogism between spheres and epistemocriticism.

these two spheres, whether separating or bringing them together, has always been fruitful.

We will focus on how the reference to the related sphere has contributed to both the emergence of new criteria of scientificity and literacies. Rather than defining *a priori* and retrospectively two domains, we will study the "uses" they make of each other's methods, objects or forms and emphasize that these "uses" are not neutral; they are both symptoms of how scholarly discourse, for example, defines literary discourse, or how "science" defines "literature" and leads to a renewal of their own methods and the definition of the foreign sphere. To approach the relationship between science and literature through the "uses", as Michel de Certeau once did, means to take an interest in both the practice of the user and the turn of events that lend themselves to it (Certeau 1980); use is the place of reciprocal adjustments and adaptations and may reveal «nature» instead of substituting itself for it.

Admittedly, one could deduce from this that the analysis of the multiplicity of individual uses is condemned to confine itself to particular cases, without ever being able to generalize its results. However, it appears that major trends are emerging without necessarily corresponding to pre-established sociological categories. The same is true of the scholarly uses of the literary; they make it possible to compare common practices between different scholarly disciplines, which nevertheless all have in common that they must justify their scientific legitimacy or that of the new methods they defend. Each discipline, in order to better claim its membership in the field of "science", develops its own approach to "literature". Three main types of uses of the "literary" by the "scientist" then appear: the ornamental use, the documentary use and the epistemic use.

Ornamental Use

The use of literary forms or stylistic figures to enhance scholarly discourse is not new in the 18th century. It presupposes from the outset that science is intended for a wider audience than that of scientists, that a unity of knowledge and truth is assumed and that the form of discourse does not alter its content. However, the specialization of a large number of scholarly disciplines at the turn of the 18th and 19th centuries requires, in particular, the invention of a language that differs from the common vocabulary, the definition of specific objects and the professionalization of science. The use of literary forms could be then a "translation" of scholarly vocabulary that seems inappropriate to reflect its specificity and runs the risk of either oversimplifying it or distorting it.

André Chénier (1762-1794) has a pretty formula in one of his poems, entitled *L'Invention*; composing scientific poems is a way of adorning the science with roses and amber, of making the poetic form the equivalent of this gangue of amber which contains certain

insects. As Hugues Marchal writes in *Muses et Pterodactyles*, the forgotten continent of so-called scientific or didactic poetry has long embodied the encyclopedic presupposition that poetry could be poetry and disseminate the knowledge of its time (Marchal 2013, 9-13). The development of scientific dialogue was based on the same assumption. But the reception, at the turn of the two centuries, of Fontenelle's *Entretiens sur la pluralité des mondes* was sometimes extremely critical (Chassot 2011, 16-19, 369-455); as early as 1795, astronomer Jérôme de La Lande undertook to compose an *Astronomie des Dames* and took care to distinguish his work from that of Fontenelle, considered "too superficial" (La Lande 1795, 9).

Little by little, then, these recognized and celebrated genres are becoming, under the pen of scientists, empty and pre-established forms, incompatible with the progress of science. Mistrust of the poetic form goes hand in hand with distrust of the didactic and often narrative genre of scholarly popularization that developed in Europe in the first half of the 19th century and is often conceived as a "translation" or even a "treason"[2]. Especially since it often uses comparisons or analogies and beautiful style becomes an indication of pure ornamentation (Weber 2014, 89-104).

But some scholars have also used stylistic figures and defended their use in their remarks, at least the proponents of natural history who, since Buffon and the "Discourse on style" he gave in 1753 when he received it at the Académie Française, have stated that "style was man", in a definition that will often be included in rhetorical textbooks. However, this Buffon declaration is at the origin, in natural history, of several recurring polemics in the 19th century that mark the great evolutions of the discipline and the successive definitions of its scientific criteria.

At a time when Georges Cuvier in turn became an Academician, the three-part praise he gave in 1812 where he drew three moments (Cuvier 1861, vol. III, 226), in the history of the human mind, of the relationship between science and the arts, could not hide his repeated efforts to classify Buffon and his disciples in the category of "great writers" who were therefore not great scholars.

In Cuvier's view, the stylistic ornamentations necessary for the enjoyment of reading and the popularization of knowledge have their downside: the danger of confusing stylistic logic with scholarly logic. There is here an aporia that is illustrated quite well by the "Historical Praise" of Lacépède, a disciple of Buffon:

> Les poissons n'ont rien à offrir à la curiosité que des configurations et des couleurs dont les descriptions entrent nécessairement dans les mêmes formes, et impriment aux ouvrages qui en traitent une monotonie inévitable. M. de Lacépède a fait de grands efforts pour vaincre cette difficulté, et il y est souvent parvenu: tout ce qu'il a pu recueillir sur l'organisation de ces animaux, sur leurs habitudes,

2. See Jeanneret 1994, 30-41. Yves Jeanneret also compares in a very nuanced way the value given by the popularization by French and English scientists in particular.

> sur les guerres que les hommes leur livrent, sur le parti qu'ils en tirent, il l'a exposé dans un style élégant et pur; [...] et n'est-ce pas en effet un grand sujet d'admiration que ces couleurs brillantes, cet éclat de l'or, de l'acier, du rubis, de l'émeraude, versés à profusion sur des êtres que naturellement l'homme ne doit presque pas rencontrer, qui se voient à peine entre eux dans les profondeurs où ils sont retenus? mais encore, les paroles ne peuvent avoir ni la même variété, ni le même éclat; la peinture même serait impuissante pour en reproduire la magnificence (Cuvier 1860, IV).

If Natural History of fishes must "necessarily" be monotonous, what about a work which avoids this monotony? The answer lies in an ironic pastiche where Cuvier forgets neither hyperbole nor rhetorical questions and grabs hold of the common ground of picturesque representation by dwelling on the limits of speech and painting to show the wonderful. In doing so, he also highlights the topical nature of comparisons of colors to gems. The metaphor here is misleading in that it gives life to what cannot be seen. But the pastiche is a double-edged sword: it reveals, at the same time as the desire to establish an impassable limit between scholarly and literary discourse, the ability to use condemned forms to seduce a wider audience than that of scholars. The «legitimacy» of the scientist and the science he practices also depends on the consent of a wide public.

The "literary", embodied by "poetics" or by "style", is therefore, under Cuvier's pen, a critical weapon whose scholar sometimes uses to invalidate the heuristic value of a text, sometimes to confirm on the contrary the scientific invalidity of a text which, by its form, prevents the diffusion of knowledge.

The use of stylistic figures has also been one of the arguments of opponents of Darwin's theories, which, in their own way, break with Cuvier's definition of classified natural history. The English naturalist has taken note of these criticisms and responded to them in the preface to *the Origin of Species*' third edition:

> Several writers have misapprehended or objected to the term Natural Selection. Some have even imagined that natural selection induces variability, whereas it implies only the preservation of such variations as arise and are beneficial to the being under its conditions of life. No one objects to agriculturists speaking of the potent effects of man's selection; and in this case the individual differences given by nature, which man for some object selects, must of necessity first occur. Others have objected that the term selection implies conscious choice in the animals which become modified; and it has even been urged that, as plants have no volition, natural selection is not applicable to them! In the literal sense of the word, no doubt, natural selection is a false term; but who ever objected to chemists speaking of the elective affinities of the various elements? – and yet an acid cannot strictly be said to elect the base with which it in preference combines. It has been said that I speak of natural selection as an active power of Deity; and who objects to an author speaking of the attraction of gravity as ruling the

> movements of the planets? Every one knows what is meant and is implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to avoid personifying the word Nature; but I mean by Nature, only the aggregate action and product of many natural laws, and by laws the sequence and events as ascertained by us. With a little familiarity, such superficial objections will be forgotten (Darwin 1861, 84-85).

The scholar's response sounds like a recognition of the need to use these metaphors and the possibility that these figures reflect a relationship between the scholarly text and the natural world that is not only mimetic. Scientific discourse, particularly when it describes long evolutions, requires analogical interpretation and obeys, at least for a time, the laws of plausibility. After all, in a number of scholarly disciplines that emerged as such, at the beginning of the nineteenth century, the very fact of not being able to resort to observation or experimentation calls for the invention of new regimes of scientific proof and, consequently, of much more complex criteria of scientificity than what has been retrospectively retained.

Documentary Use

And literature, there, plays a new role. The literary text can indeed be conceived as likely to constitute proof or a document, for want of anything better. This, moreover, in literary criticism, is not new; it is the hallmark of French literary criticism at the end of the 19th century, as embodied in the quartet formed by Sainte-Beuve, Taine, Brunetière and Renan. But it may well be that before the documentary use of the literary text justified the scientific methods of literary studies, it contributed, in the scholarly discourse, to the founding of certain disciplines in science. In the case of this second use, "literature" is understood both as a *corpus* of works and as a set of methods forming "literary studies".

Thus, some writers' figures and methods of analysis contributed to the development of alienist medicine in the second half of the 19th century. After the Italian Cesare Lombroso, for example, had spread the concept of degeneration to describe a certain retrogadation of the human species, the Austro-Hungarian doctor and journalist Max Nordau made a literary commentary in *Entartung* in 1892 on poems by Verlaine or Mallarmé to highlight the symptoms of the disease:

> In der Ausdrucksweise Verlaines fällt zweierlei auf. Einmal die häufige Wiederkehr desselben Wortes, derselben Wendung, jenes «Wiederkäuen», «*rabâchage*», das wir als Merkmal schwachsinnigen Denkens kennen gelernt aben. Fast in jedem seiner Gedichte werden einzelne Verse und Halbverse einigemale ungeändert wiederholt und statt eines Reimwortes erscheint oft einfach das nämliche Wort

> wieder. Wollte ich alle derartigen Stellen anführen, so müßte ich ungefähr seine sämmtlichen Gedichte abschreiben. Ich will also nur einige Proben geben, darunter mehrere in der Ursprache, damit ihre Eigenthümlichkeit dem Leser voll zum Bewußtsein gelange. In "*Crépuscule du soir mystique*" erscheinen die Verse "Die Erinnerung sammt der Dämmerung" und "Georgine, Lilie, Tulpe und Ranunkel" ohne innere Nothwendigkeit je zweimal. Im Gedichte "*Promenade sentimentale*" verfolgt das Beiwort *blême, fahl*, den Dichter nach Art einer Zwangsvorstellung oder "Onomatomanie und er wendet es auf Wasserrosen und Wogen (fahle Wogen!) an. *Nuit du Walpurgis classique* beginnt: " ... Ein rhythmischer Sabbat, rhythmisch, äußerst rhythmisch." In der "Serenade" wiederholen sich die beiden ersten Strophen wörtlich als vierte und achte. [...]
> Die zweite Eigenthümlichkeit der Redeweise Verlaines ist das andere Merkmal des Schwachsinns: das Verknüpfen gänzlich unzusammenhängender Haupt- und Beiwörter, die einander durch eine sinnlos schweifende Ideen-Assoziation oder durch eine Klang[198]ähnlichkeit rufen. Einige Beispiele haben wir schon in den bisher mitgetheilten Proben gefunden. Es war in diesen vom "ungeheuern und zarten Mittelalter" und vom "Brandmal, welches donnert" die Rede. Verlaine spricht auch von Füßen, "die mit einer reinen und weiten Bewegung glitten", von "einer engen und weitläufigen Zuneigung", von "einer langsamen Landschaft", "einem schlappen Saft" (*jus flasque*), einem "vergoldeten Duft, einer "zusammengefaßten" oder "gedrängten Umrißlinie" (*galbe succinct*) u. s. w. Die Symbolisten bewundern diese Erscheinungsform der Imbecillität als "das Suchen nach seltenen und köstlichen Beiwörtern", *la recherche de l'épithète rare et précieuse*. (Nordau 1892, vol. I, 200-201).

Verlaine's poetic "inventions" then became, under the pen of the doctor who commented on the text, symptoms of the debility of the individual and the poet, and documents supporting a general degeneration of which the poets were, in his opinion, the precursors.

But, at the beginning of the 19th century, scientists had already used the scientific (and literary) glossary of ancient texts to look for evidence of the theories they defended. Literature (or texts that are often sacred or ancient, defined by scholars as "fables" or "legends") somehow replaces the lack of material evidence and, above all, the impossibility, in a very long (and not human) space or time, of ever finding evidence.

At the same time that Jérôme de La Lande (1732-1807), then Jean Baptiste Joseph Delambre (1749-1822) pleaded for the mathematical future of astronomy and, in order to justify this evolution, retraced its history by seeking in ancient Greek and Chaldean myths, the trace of the astronomical knowledge of the ancient peoples, a new translation into French was published in 1813 of the Mathematical Composition of Ptolemy by Halma, annotated by Delambre. As an experienced hellenist and philologist, Halma composes a very interesting preface in which he justifies the need for this translation by highlighting the errors of the two earlier Latin versions (Ptolémée 1813, vol.I, iv).

The use of historical and philological investigation is what makes it possible to identify precisely the dates and places of the observations described by Ptolemy (avoiding, for example, confusing Adrien and Domitian, i. e. 463 and 473) and to better understand his calculations, which, in turn, make it possible to verify the contemporary laws deduced from the observations of stars. Thus, the methods of scholarly glose, reserved for the Belles Lettres, are put at the service of evidence for contemporary measurements and calculations.

Comparative philology has been a synonym of «cosmology» at the Academy of Inscriptions and Beautiful Letters since 1830; Hindu and Eastern antiquity, as before biblical writings and Latin and Greek mythology, provides possible evidence of cosmological knowledge, while passing from the status of «myth» to that of legend and literary fable. But already Georges Cuvier in the «Discourse on Revolutions on the Surface of the Earth», which in 1821 constitutes the preface to the *Recherches sur les ossemens fossiles*, referred both to the most recent analyses of Greek and Latin antiquity texts and to contemporary works on Hindu Vedas and Pouranas in order to distinguish the legendary from the true and establish that there was no single Flood (Cuvier 1821, vol.I, lxxx-xc). The evidence of geological theory is not only material but also bookish; at least the interpretation of ancient texts makes them documents containing a certain amount of information that could prove useful, if never being able to observe the first revolutions of the globe. In passing, the categories of myth and legend are rethought by philologists and writers who take advantage of this opportunity to modify the literary *corpus* of so-called canonical works.

This also means that the regime of proof is changing and that mathematical deduction is gradually being replaced by the idea of induction, particularly in the sciences of Nature. But it could also be, at the same time, that the literary narrative becomes a method of argumentation; “literature” means scholarly methods and literary writing or works.

Epistemic Use

In the third chapter of the first historical volume of the *Principles of Geology* (1830), the lawyer and scientist Charles Lyell denounced the «preconceptions» that prevent the geologist from having a fair understanding of the evolutions of the globe and, therefore, from representing them well: he intends to condemn the old systems and at the same time to defend his hypothesis of continuism and presenteism. Which he does by his own way of arguing and writing.

Far from being just a digression, the historical part of the treaty contributes to the scholarly demonstration. Lyell applies the same principle to the composition of a History of science as to the elucidation of global developments. He highlights the assumptions

that have influenced the oldest theories and prevented them from formulating the idea of continuity earlier. But in doing so, he suggests that the same assumptions justify the theories of those of his contemporaries who defend the hypothesis of successive disasters: the same causes, the same effects. However, the demonstration involves the composition of counterfactual stories and the rewriting of literary fictions.

One of the presuppositions denounced by Lyell is both ancient and contemporary: it is that of the inability to consider long periods of time and results from the influence of the holy writings. To illustrate this, he borrows an example from archaeology and invents a very long story, immediately placed under the seal of imagination:

> Let us imagine, for example, that Champollion, and the French and Tuscan literati lately engaged in exploring the antiquities of Egypt, had visited that country with a firm belief that the banks of the Nile were never peopled by the human race before the beginning of the nineteenth century, and that their faith in this dogma was as difficult to shake as the opinion of our ancestors, that the earth was never the abode of living beings until the creation of the present continents, and of species now existing, - it is easy to perceive what extravagant systems they would frame, while under the influence of this delusion, the account for the monuments discovered in Egypt. The sight of the pyramids, obelisks, colossal statues, and ruined temples, would fill them with such astonishment, that for a time they would be as men spell-bound – wholly incapable to reason with sobriety. They might incline at first to refer the construction of such stupendous works to some superhuman powers of primeval world. A system might be invented resembling that so gravely advanced by Manetho, who relates that a dynasty of gods originally ruled in Egypt, of whom Vulcan, the first monarch, reigned nine thousand years. After them come Hercules and other demigods, who were at last succeeded by human kings (Lyell 1830, vol.I, 87-88).

The inability to understand long durations leads to the formulation of theories that can be read as extravagant fictions even though they are far from emanating from complete ignorance: extravagance or improbability may come from the need for the scientist to make what he knows or has observed coincide with a dogma to which he must conform.

More precisely, Lyell experiences the inadequacy of discursive and narrative frameworks to the events told. In act, he proposes a solution capable of going beyond this constitutive aporia of geological science: inventing a counterfactual and fictitious narrative.

Lyell also uses literary fiction. Thus, when he denounces the influence of the situation of men (on the surface of the Earth) on their analysis of the processes at work in the constitution of a chronology, the scientist invents a curious story whose hero is none other than one of the characters in Alexander Pope's heroic-comic poem, *The Rape of the Lock*, dated 1712.

> But if we may be allowed so far to indulge the imagination, as to suppose a being entirely confined to the nether world – some «dusky melancholy sprite», like Umbriel, who could «flit on sooty pinions to the central earth», but who was never permitted to «sully the fair face of light», and emerge into the regions of water and of air; and if this being should busy himself in investigating the structure of the globe, he might frame theories the exact converse of those usually adopted by human philosophers. [...] Such might be the system of the Gnome at the very same time that the followers of Leibnitz, reasoning on what they saw on the outer surface, would be teaching the doctrine of gradual refrigeration, and averring that the earth had begun its career as a fiery comet, and would hereafter become a frozen icy mass. The tenets of the schools of the nether and of the upper world would be directly opposed to each other, for both would partake of the prejudices inevitably resulting from the continual contemplation of one class of phenomena to the exclusion of another" (Lyell 1830, vol. I, 93-94).
>
> The scientist therefore imagines that the head of the gnomes of Pope's poem, whose role, in the poem, is to return to the Cave of Spleen to bring back tears that will further aggravate Belinda's desolation, could be a geologist. The choice of the satirical poem is probably not insignificant; just as Alexandre Pope mocked in his text an anecdote that had provoked the war between two easily recognizable families of Catholic aristocrats, Lyell mocks Leibniz and his disciples in by concluding his story with a parallel between the theories of the gnome and those of the philosopher. But in so doing, the geologist also gives the right to imagination and imaginary narrative in the presentation of scholarly theories: not only does he inscribe his subject in the field of literary fiction by explicitly making an imaginary character the inventor of a theory considered fantastic, but he also shows, by using reasoning through the absurd, that his own narrative is distinct from condemned theories. The explanation of the misleading nature of Leibniz's theories requires a narrative of literary fiction that obeys logic and plausibility. The experienced geologist will take into account both what he can observe and what he cannot see but can infer; he will undoubtedly, like Lyell, be condemned to formulate imaginary hypotheses, to give free rein to his imagination. But the logical narrative he will then propose, like Umbriel's theories, will be less absurd than Leibniz'. The literary fiction of Umbriel's account of his underground journey, sketched here by Charles Lyell, is both a scientific demonstration and a model of geological writing.

It is therefore necessary for geological scientists to develop a regime of evidence that takes into account plausible interpretation, the possible rather than the observable. The reasoning, based on the interpretation of a few facts, will proceed by induction and by analogy; it may lead to results that can be retrospectively observed and verified, once all underwater species have been discovered, for example, which may help to identify fossil species. Among the analytical methods developed is the "Zadig method" or "prophecy retrospective", defined by Thomas Huxley based on Georges Cuvier's work in the *Research on Fossil Ossemens*.

The reference to the character in Voltaire's philosophical tale and, more precisely, to one of the passages in the tale where Zadig is imprisoned for having certified the passage of the dog and the queen's mare and at the same time confessed not to have seen them, is not the fault of Huxley but of Cuvier himself. In the "Discourse on the Revolutions of the Earth's Surface", which opened the publication of the *Research* in 1821, the naturalist justified his ability to identify fossil species by exposing the principle of correlation of shapes developed by him in the field of comparative anatomy. The scholar must expose both the principles and laws of the discipline, demonstrate their foundation and draw from them methods of analysis and interpretation that aim at truth and not plausibility.

Georges Cuvier then took the time to point out that the principle of the correlation of forms, far from being explained, is based on multiple observations which make it possible, for example, to know that only herbivores, equipped with forked feet, can possess a horn:

> Cependant, puisque ces rapports sont constants, il faut bien qu'ils aient une cause suffisante; mais comme nous ne la connaissons pas, nous devons suppléer en défaut de la théorie par le moyen de l'observation. Elle nous sert à établir des lois empiriques qui deviennent presque aussi certaines que des lois rationnelles quand elles reposent sur des observations assez répétées; en sorte qu'aujourd'hui quelqu'un qui voit seulement la piste d'un pied fourchu, peut en conclure que l'animal qui a laissait cette empreinte ruminait; et cette conclusion est tout aussi certaine qu'aucune autre en physique ou en morale. Cette seule piste donne donc à celui qui l'observe, et la forme des dents, et la forme des mâchoires, et la forme des vertèbres, et la forme de tous les os des jambes, des cuisses, des épaules et du bassin de l'animal qui vient de passer: c'est une marque plus sûre que toutes celles de Zadig (Cuvier 1834, 184-185).

The allusion could only be a nod to his literate public; nevertheless, Thomas Huxley, in 1880, used Cuvier's quotation as a pretext to establish the "Zadig method" as a model of the learned reasoning that would allow biologists to discover the origin of beings and their evolution. Voltaire's text, duly and extensively commented on at the beginning of "On the Method of Zadig", becomes the archetype of the scholarly narrative; philosophical fiction, far from being merely an emblem, paradoxically confers on reasoning by induction and by analogy, a king of legitimacy in scholar fields.

The essay "On the Method of Zadig. Retrospective Prophecy as a function of science" opens with a commentary on Voltaire's tale, as an introduction to the almost complete quotation from Chapter III "The dog and the horse". These first lines are extremely curious: Huxley pretends to treat Zadig as a real philosopher and underlines how little is known about his life, despite Cuvier's reference to this individual. The author then borrows some biographical elements from the tale and is surprised not to have found a trace in the list of known rulers of Babylon of a man called «Moabdar» who was supposed to have ruled during Zadig's time (Huxley 1893, vol IV, 1-3).

The historian's disappointment is only apparent. The ignorance of the scientist who would confuse tale and biography and make Zadig a historical character is a trick that allows Huxley to better identify in the end from the point of view of learned truth, fiction and historical text. History and storytelling are quite different in that the first, alone, claims to be true: but it cannot be deduced from the fact that the story does not refer to any referential event that it is false or misleading. From the point of view of knowledge and access to a certain truth, historical narratives and fictional stories are equal. The existence of Zadig has no bearing on the scope of the ideas he embodies and on the ability of the literary text to highlight laws of the mind that science can grasp. These laws can neither be verified by observation nor confirmed by experimentation and yet be true.

As Claudine Cohen showed in her commentary on Huxley's essay, this Darwinian disciple transformed the meaning and use of Cuvier's Zadig method, making induction reasoning into reasoning by induction and hypothetical deduction (Cohen 2011, 18-24); but Charles Sanders Peirce also baptized, in 1866, the learned reconstruction from indices of the name «abduction» which consists in gathering clues to draw plausible hypotheses. Umberto Eco, long after Pierce, pointed out that this logical approach to recreating worlds (and, in geology, to recreating past worlds) could also characterize the novelist's practice (Eco 1990, 236).

Shortly before Huxley, in 1870, Edgar Quinet, in *La Création*, also undertook, as an historian, to "bring the contemporary natural history revolution into the general domain of the human mind" (Quinet 1870, vol I, I). Geology is the spearhead of this methodological "revolution". From the outset, the historian underlines the many common points between civil history and natural history and allows himself to use this observation to suggest a broader application of geological methods to history. It would be a question of starting from the present to explain the past, which apparently contradicts the historian's approach but which, according to Quinet, corresponds better to the very idea of a method

> Le géologue, voulant procéder du connu à l'inconnu, commence le plus souvent l'histoire de la terre par le tableau des époques les plus récentes; d'où il descend à une époque antérieure, et de celle-ci à une autre plus ancienne, jusqu'à ce qu'il plonge dans les couches primaires au-delà desquelles la science lui échappe. [...] Au contraire, par la méthode ordinaire, nous commençons l'histoire humaine par ce que nous ignorons le plus, par les origines des peuples, des langues, des institutions; d'où il suit que, contrairement à ce qu'exige toute vraie science, notre premier pas est le plus incertain (Quinet 1870, vol. I, 57-58).

History, conversely, has contributed to the progress of geology by teaching scientists to interpret documents, thus avoiding naturalists from giving in to an unbridled imagination to rebuild past worlds. There is more: the scientific revolution by which geology has shown man that the world around him has not always been, leads, according to Edgar Quinet, to new articulations between science and the arts.

If language indeed struggles to capture the "revealed worlds of yesterday", art can easily contribute to their representation and the creative imagination can thus fully participate in the elaboration of scholarly theories: "Et pourquoi les arts ne nous aideraient-ils pas à retrouver ce passé? Si nous voulons faire rentrer dans les arts la grande imagination créatrice, n'est-ce pas là une voie qui s'ouvre d'elle-même et invite le génie à s'y engager? Raphaël a osé peindre les prémices du globe et les continents ébauchés sous le doigt de l'Éternel, Corrège le bois sacré de Jupiter, Nicolas Poussin le déluge, Dominiquin les campagnes bibliques de Sodome. Pourquoi le peintre n'irait-il pas aujourd'hui au-delà de ces horizons?". Not only could artists therefore take part in the progress of geology, but geology, by delivering new subjects and themes, could also contribute to the advent of a new art, of which the historian sketches, in a remarkable *ekphrasis* of paintings to come, some of the future achievements.

Thus geology and its methods of retrospective interpretation and extrapolation are an opportunity, in the eyes of Edgar Quinet, to renew all the human sciences but also to reunite the sciences and the arts, and even to confer on the arts a scholarly aim without removing them from their primary concern: the future artist would only have to draw on current forms to imagine ancient forms, which, according to Quinet, corresponds entirely to the «realistic» aim of the art of his contemporaries:

> Si les artistes grecs et modernes étaient réduits à imaginer des alliances de formes impossibles, l'artiste dont je parle n'aurait, au contraire, qu'à puiser dans le monde organisé; il aurait l'avantage de trouver sous sa main des formes toutes préparées dans l'atelier de la nature; il pourrait ainsi être réaliste tout en dépassant les limites du monde actuel, ce qui semble le but suprême de l'art (Quinet 1870, vol. I, 35-36).

Geology would open the way for writers and novelists to a new realism that would not claim conformity with the reader's experience, nor historical truth, but natural truth. This would renew the definition of "literature" as a corpus of works.

Three uses of literature by scholars seem to be permanently fixed and defined at a time when scientific disciplines are emerging and claiming their own scientificity, distinguishing themselves and using both the tools or methods of what, in the eyes of their supporters, is on the way to becoming foreign to them. Ornamental use is that which reduces literature to pretty forms, intended to seduce, or to deceive but essential to convince the reader. The documentary use is reflected in the reference to stories often considered fabulous or legendary and duly analyzed and criticized according to the practices of scholarly (and literary) glose. The epistemic use of literature most often involves borrowing from literary works of tradition and practicing, in the scholarly text, a literary writing that merges with that of fiction.

These three types of uses are not mutually exclusive. They often reflect the desire to establish new scientific criteria and define disciplinary practices. But they hardly leave

"literature" (as a corpus and discipline) unscathed in that they create its contours to make better use of it and, in return, sometimes change its form and purpose.

It seems that the use of the "literary" by the supporters of a discipline in search of new criteria of scientificity is recurrent in the history of knowledge and regularly reappears at a time when disciplinary boundaries are being rethought and even abolished. It is at least particularly popular, nowadays, in the contemporary field of the humanities or social sciences and has recently experienced famous developments in anthropology, sociology, geography and history. The "manifesto for the social sciences" composed by Ivan Jablonka under the title *L'Histoire est une littérature contemporaine* thus promises «social sciences that move and captivate» and, correlatively, "a literature that produces knowledge" (Jablonka 2014). Literary writing, in so far as it at least makes it possible to clarify the narrator's point of view, would thus be the most appropriate place not only for the expression of a certain subjectivism compatible with the criteria of scientificity in the social sciences but also for the implementation of a constant reflexivity that would submit the learned methods to the judgment of the reader.

Literary scholars may be pleased with this tribute to the objects of their studies, even as "literature", understood both as a corpus and as a discipline, emerged at the turn of the 18th and 19th centuries in Europe as a way of distinguishing itself from rhetoric and its social and political utility and then refusing any moral utility (Marx 2005). But they may also wonder about the consequences, for literary studies and for literature itself, of this «literary turn» of the human and social sciences.

The detour through the history of the uses, in emerging sciences or disciplines, of the "literary" is an invitation to question the definitions of literature that emanate from these new disciplinary practices, to note their multiplicity and perhaps to observe the differences that exist between the "literatures" produced by scholars and the meanings of "literature" when studied by specialists of literary studies. Ivan Jablonka's book does not confuse "literature" and "History" in that the historian defines his own practice in relation to a certain "literature" partly determined *a priori* by the disciplinary field from which the scientist comes; "literature" is essentially fiction or autofiction. But it can also be, as the introductory statement quoted shows, a means of «seducing» or "captivating", i.e. a pretty form or a tool of "knowledge"; ornamental and epistemic uses may sometimes meet.

References

Chassot, Fabrice. 2011. L*e Dialogue scientifique au XVIII*e *siècle.* Paris: Garnier.

Cohen, Claudine. 2011. "Science ouverte." In *La Méthode de Zadig. La trace, le fossile, la preuve*, Paris: Éditions du Seuil.

Cuvier, Georges. "Discours préliminaire." In *Recherches sur les ossemens fossiles.* vol. I. Paris: Dufour et D'Ocagne.

Cuvier, Georges. 1834. *Recherches sur les ossemens fossiles.* vol. I. Paris: Dufour et d'Ocagne.

Cuvier, Georges.1860. “Éloge historique.” In *Histoire naturelle comprenant les cétacés, les quadrupèdes ovipares, les serpents et les poissons.* Paris, Furne: Lacépède.

Cuvier, Georges. 1861. “Discours de réception de M. Cuvier à l’Académie Française.” In *Recueil des éloges historiques lus dans les séances publiques de l’Institut de France*, vol. III. Paris: Firmin-Didot.

Darwin, Charles. 1861. *On the Origin of Species by means of Natural Selection or the Preservation of favored races in the struggle for life.* London: John Murray.

De Certeau, Michel. 1980. *L’Invention du quotidien.* Paris: Gallimard.

De La Lande, Jérôme. 1795. *Astronomie des Dames.* Paris: Cuchet.

Eco, Umberto. 1990. “Corna, zoccoli, scarpe: tre tipi di abduzione.” In *I Limiti dell’interpretazione.* Milan: Bompiani.

Haeckel, Ernst. 2018. *Entre science et esthétique.* Edited by Henning Hufnagel, Frank Jäger et Nicolas Wanlin. Arts et Savoirs n°9.

Jablonka, Ivan. 2014. “Quatrième de couverture.” In *L’Histoire est une littérature contemporaine.* Paris: Éditions du Seuil, “La bibliothèque du XXIe siècle”.

Jeanneret, Yves. 1994. *Écrire la science.* Paris: Presses Universitaires de France.

Hallyn, Fernand. 1987. *La Structure poétique du monde. Copernicus, Kepler.* Paris: Éditions du Seuil, «Des Travaux» series.

Hallyn, Fernand. 2004. *Les Structures rétoriques de la science. De Kepler à Maxwell.* Paris: Éditions du Seuil, «Des Travaux» series.

Huxley, Thomas. 1893. “On the method of Zadig. Retrospective Prophecy as a function of Science.’ *Science Hebrew Tradition*, *Collected Esays*, vol. IV. London: Macmillan.

Lyell, Charles. 1830. *Principles of Geology.* Vol. I. London: Murray.

Marchal, Hugues, dir.. 2013. “Avant-propos.” In *Muses et Ptérodactyles. La poésie de la science de Chénier à Rimbaud,* 9-13. Paris: Éditions du Seuil.

Marx, William. 2005. *L’Adieu à la littérature. Histoire d’une dévalorisation, XVIIIe-XXe siècle.* Paris: Minuit.

Nordau, Max. 1892. *Entartung.* vol. I. Berlin: Duncker.

Ptolémée. 1813. *Composition mathématique.* vol. I. Trad. Fr. P. Halma. Paris: Henri Grand.

Quinet, Edgar. 1870. *La Création.* vol. I. Paris: Librairie internationale.

Wanlin, Nicolas. 2011. “La poétique évolutionniste, de Darwin et Haeckel à Sully Prudhomme et René Ghil.” *Romantisme/4* n°154: 91-104.

Weber, Anne-Gaëlle. 2014. “Beauté des astres, beauté du style. Les débats sur l’existence d’un style savant au début du XIXe siècle.” In *La Guerre des étoiles. L’astronomie entre science et littérature* edited by Stéphane Zékian, 89-104. Revue *Orages*, n°13.

Vuillemin, Nathalie. 2009. *Les beautés de la nature à l’épreuve de l’analyse (1744-1805).* Paris: Presses de la Sorbonne Nouvelle.

Zékian, Stéphane. 2011. “Siècle des lettres contre siècle des sciences: décisions mémorielles et choix épistémologiques au début du XIXe siècle.” *Fabula-LhT* n°8, “Le Partage des disciplines.” Mai 2011. http://www.fabula.org:lht:8:zekian.html

Zékian, Stéphane. 2014. *L’Invention des classiques.* CNRS Éditions.

MESMERISM IN NINEETEENTH–CENTURY GREEK POPULAR LITERATURE

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The aim of this paper is not to provide a detailed analysis of animal magnetism, its internal characteristics and the polemics against it since the very moment of its appearance. The relevant literature is vast and informative. Nevertheless, it is worth mentioning that many articles and books have been devoted to a theory and practice which has been characterized as pseudoscience as early as in 1784 by two French commissions (Franklin and Lavoisier being among their members) (Darnton 1968; Best, Duncan, Lee 2003; Kihlstrom 2002; McConkey, Campbell 2002).

In fact, the report of the Commissions denies the existence of any autonomous force pervading the animate and the inanimate words, a force which was the kernel of the theory expressed by Mesmer and his followers. Nevertheless, despite the proof of its non-scientific character mesmerism seems to have a noteworthy presence among the societies of the 19th century (Wrobel 2015; Winter 1994; Miodoński 2001).

For instance, two interesting monographs investigate the popularity of mesmerism in England and France, namely, *Victorian Literacy Mesmerism* edited by Martin Willis (Willis, Wynne 2006) and Catherine Wynne and *Mesmerism and the End of Enlightenment in France* by Robert Darnton.

It is of no surprise that mesmerism was introduced also in the countries of the European peripheries as a sign of modernity and equivalence with the so-called center.

In Greece mesmerism became known firstly by a series of articles in the early 19th century journal *Hermes the Scholar*.

Hermes the Scholar circulated from 1811 to 1821 and became the most influential vehicle for the communication of the up to date scientific ideas to the Greek intelligentsia of the time. It was characterized by the strong support of the ideas of the Enlightenment and many articles on chemistry, physics, mathematics and natural sciences appeared in its pages. Although most of these articles were translations or compilations from relevant European sources, there are also some original ones which prove the capability of the Greek scholars to assimilate the new theories and ideas and to express their own thoughts about them (Vlahakis 1999).

The first article on animal magnetism appeared in the 15th July 1818 issue (Polyzoidis 1818). It was a translation of an essay originally written by a Dutch lawyer P. G. van Ghert that translated in German by Mr. Kinper who taught in Iena and published it in the German *Archiv für den thierischen Magnetismus* (Archives of Animal Magnetism) which started to be published in 1804 and continued its circulation for many years showing the degree of mesmerism's influence in the German countries.

The Greek translator was Anastasios Polizoidis, a young student of medicine in Vienna, just sixteen years old in 1818. Polizoidis, who later played a significant role in public affairs and worked towards the independence of Greece from the Ottoman Empire, was a strong supporter of animal magnetism (Gardika 1971).

He believed that no medicine practitioner could deny the usefulness of animal magnetism and considered Germany as the center for its development. To support his view, he adopted the idea that the kind of mesmerism developed in France had nothing to do with animal magnetism in Germany as it was practiced by scientists and doctors like Gmelin, Wienholt, Heinecken, Pezold, Reil, Schelling, Schelver and others.

One year later another Greek scholar Dionysios Zagoritis, member of the clergy, surprisingly enough (Makrides 1999, 231-98), gave a detailed biography of Mesmer also translated from German[1] while Nikolaos Sergios, student in the University of Pavia[2] wrote a short critical paper about animal magnetism trying to prove that it had no scientific foundations at all.

In fact, as it was the case also for some other matters like the weight of the atmospheric air, a debate took place through the pages of *Hermes the Scholar* about the scientific value of animal magnetism.

However, with the establishment of the independent Greek state things seemed to change.

Animal magnetism was no longer a disputable scientific subject. Somehow it suddenly turned into an interesting recreational activity.

What is interesting in this case is that the significance of animal magnetism was not minimized in a way so that it would be among the interests of the low uneducated social classes.

On the contrary, there had been reports in the Press of spiritualistic meetings related to animal magnetism in the salons of the rising Greek bourgeoisie that had been presented both in a serious and in a satirical way.

Interestingly enough, professors of the newly established University took part in many meetings of this nature. Among those there was Xavier Landerer (1809-1885), professor of Chemistry and personal pharmacist of the young King Otto. Landerer re-

1. The title of the article published in *Hermes the Scholar*, January 15th ,1819, p. 63-72, was "The life of Mesmer" (in Greek) translated from the German.
2. For the role of the University of Pavia and the Italian Universities in general in relation with the higher education of the Greeks before the Greek Revolution in 1821 see: Vlahakis 1998.

mained in Greece even after the dethronement of King Otto and wrote a number of textbooks on Chemistry and Pharmacology. He was considered a respected member of the Athenian society and participated actively in the life of the capital of the new state.

His German origin and education, in a country the structure and the function of which were actually an imitation of the German system, was obviously the cause for his attraction towards mesmerism, a practice with long tradition and great acceptance in the German lands.

Therefore, this spread of animal magnetism even in the form of a light social activity was one more effort of the bourgeoisie to adopt respective European attitudes and take part in relevant events in Europe. In this way, all activities concerning animal magnetism and its adoption was not a single and, in a way, socially unconscious action but belonged to the very context of modernity through which this social class used 'to feel' European.

The attempt of the Greek merchants, bankers and high rank public servants to behave like the other Europeans included also the shift towards the replacement of traditional with western outfits, the introduction of bicycle, sea baths and even the organization of the first modern Olympic Games in 1896 (Young 1996). All these happened though in a city full of dust, without drinking water and proper roads. Therefore, it is not a surprise that all the above nouveautés were often commented on and mocked by the satirical press of the time, which found in them an easy target.

However, it is interesting to see that in a really small country - small in terms of geography as well as of number of population in 19th century - there were quite many magazines and newspapers with different types of content which addressed different types of readers (Droulia, Koutsopanagou 2008, Vol. I, 542, vol. II, 699, vol. III, 597, vol. IV, 583).

Regarding animal magnetism the first professor of Physics in the University of Athens, Dimitrios Stroubos (1806-1890), a man who had studied in Paris and often published papers in the official journal of the French academy of sciences, deconstructed its scientific nature in two articles published in the magazine *Chrysallis* in 1863, a magazine having middle class people as main reader's audience (Stroumbos 1863,179-181, 210-213). Interesting enough, these were the only articles written by Stroubos in this particular magazine, though he used to write and publish popularized scientific articles in many journals of that time.

Stroumbos in these particular articles, looking back at the past, a method which was widely accepted at the time, came to the conclusion that any pseudoscience such as animal magnetism or alchemy inevitably turned out to be a form of fraud however enchanting they might be.

This public expression of disapproval of the animal magnetism by Stroubos is of a particular importance, while Stroumbos translated in Greek in 1881 the book written by

William Crookes on the movement of the molecules. Crookes was a prominent physicist but also a fervent supporter of spiritualism.[3]

Nevertheless, in the magazine called *Efterpi*, a brief reference was made to the well-known phenomenon of the moving of the table and the anonymous writer remarked playfully that in an era of political inertia, even tables whirl. Thus, as he mentioned in the short piece he wrote, we shall have to see for ourselves whether the movement of inanimate objects has a scientific basis or not (Anonymou 1853, 384).

Towards the end of the century, in 1891, N. Kallikounis (1862-1922) published an extensive article on animal magnetism in the *Parnassos* magazine (Kallikounis, 11-156). This magazine was one of the most significant of its time and the publication of the relevant article was therefore important. *Parnassos* was actually the official journal of the most prestigious cultural society in Greece at that time. Members of this society, which played in a way the role of an Academy of sciences and arts were all the influential members of the Athenian life at that time.

Actually, in the above-mentioned paper, Kallikounis discussed in detail and based on good bibliographical resources the status of animal magnetism during the second half of the nineteenth century in Europe. That is probably a result of his own interest of the subject as Kallikounis was a medical doctor and professor of medicine in the University of Athens.

Kallikounis seems to be the expert of the time about animal magnetism as he published similar articles also in other magazines, like *Attikon Mouseion* in 1892.

However, the most interesting aspect in our first attempt to register the presence of animal magnetism in the popular literature of the late nineteenth century Greece is the publication of the magazine called *Aristophanes and the mesmerized Woman*. This was a magazine which was published around 1858-59 by Sophocles Karydis.

Sophocles Karydis was born in Tripoli, Peloponissos in 1832 and it was there where he completed his secondary education. We know that he studied in the university, but we do not know which school he was a student of and if he actually completed his studies. Nonetheless, he was exceptionally well educated as this is apparent through his literary performance. Since 1851 he had become exclusively interested in satirical poetry the content of which was anti monarchic, anti authoritarian, bold, activist and in favor of the people. Furthermore, he mocked the servile mimicking of the invading foreign lifestyles which had been accepted by the youth of the bourgeoisie.

In 1853 in the satirical newspaper *Velos* (The arrow) which actually has been created by him, he published verses through which he mocked scandalous actions of the political regime. Karydis may be considered as the founder of the satirical literature of this kind in Greece, later coming to the level of a worthy to be considered as real literature by another well-known in Greece poet, Georgios Souris (1852-1919).

3. On the matter, see indicatively: Hall 1963.

In 1858 Sophocles Karydis was a young lad of twenty-six. Till then, several magazines and newspapers had published his work. Thus, he decided to publish his own magazine. He also decided on giving it a strange title "Aristophanes and the Mesmerized Woman". Aristophanes was familiar to him as he had been studying the original works of the ancient writer of comedies. He communicated mentally with him, he was inspired by him and had the feeling he was Aristophanes' intellectual child.

On the very first page he outlined the profile of the magazine and determined the main goal of the publication. In his way he expressed his wishful thinking to be regarded as the one to continue Aristophanes' work, hence the choice of the title of the magazine. The fact that he had been influenced by the ancient writer justified his youthful ambition. Therefore, he assumed the use of the name Aristophanes and permanently used it as his pen name.

During that time events of hypnotism and spiritualism were very trendy and the title of the magazine attracted people's interest.

In order for Sophocles Karydis to render his topics attractive he presented a hypnotist who using his magnetic staff hypnotized a woman and sent her to places and people he had chosen himself to mock.

"The Mesmerized Woman" presented the desirable facts and Aristophanes made an excellent use of them. With Aristophanes' mastery he devised satirical verses, imaginative acrostics, entertaining riddles and other fascinating things. The magazine became very fashionable. It educated people in an amusing way. It gave people culture and entertainment. It offered food for thought. Interestingly enough, the more the middle class liked the magazine, the more annoyed and infuriated the ruling governing system and the individuals the magazine made fun of.

Promiscuous behavior did not characterize only the young women but also the young men. By the time, to use a modern phrase, a kind of sexual revolution had broken out. At times it took extreme and unnatural proportions.

The young women did not hide their sexual desires, which were actually normal. However, some young men revealed their desires in a way that was not within the accepted moral standards of the period. In other words, these young men displayed offensive effeminacy, which was very much the trend in Paris ("άρτι εισαχθείσαν εκ Παρισίων").Thus, in this magazine among other things he mocked this attitude, mainly because it was uncontrolled mimicking.

Anyway, it is not a surprise, that Karydis, as it was the case everywhere failed to understand the gender issue behind animal magnetism. Even today we very rarely think that the subject of magnetism is always a woman and the magnetizer is always a man. So that this issue according to our opinion deserves a more careful study, especially for a country of the European periphery and we intend to examine it in a more detailed paper.

Sophocles Karydis died in 1893. Ioannis Damvergis, an important Greek journalist of the time, who had also suffered prosecutions and imprisonment because of his

democratic ideas had said that Sophocles Karydis was a remarkable social and political commentator, a sharp critical eye, who was often sent to prison because he uttered in public what other people talked secretly about or swallowed. Damvergis also said that towards the end of Karydis' life, the latter struggled to make ends meet while being alone and feeling disgusted at himself and the world. He met his end at the age of sixty-one.

It was probably the same more or less period that mesmerism died also, definitively this time, as a scientific practice.

It remained alive though, but never again as a mainstream subject, like zombies and vampires remain alive only in our imagination. Just in our imagination?

References

Anonymous. 1853. "Animal Magnetism." *Efterpi* 16: 384.

Best, Mark, Duncan, Neuhauser, & Lee, Slavin. 2003. «Evaluating Mesmerism, Paris, 1784: The controversy over the blinded placebo controlled trials has not stopped.» *BMJ Quality & Safety* 12, no. 3: 232-233.

Darnton, Robert. 1968. *Mesmerism and the End of the Enlightenment in France.* Harvard University Press.

Droulia, Loukia & Koutsopanagou, Gioula, eds. 2008. [*Encyclopaedia of the Greek Press 1784-1974],* Vol. I, 542, vol. II, 699, vol. III, 597 vol. IV, 583. INR/NHRF - 103, Athens.

Gardika, Katerina. 1971. "Anastasios Polyzoides and the Greek Revolution." *Mnimon* 1: 23-52 (in Greek).

Hall, Trevor H. 1963. *The Spiritualists: The Story of Florence Cook and William Crookes.* London: G. Duckworth.

Kallikounis, N. "Animal magnetism, spiritualism, and other curious phenomena." *Parnassos* 14(3): 11-156.

Kihlstrom, John F. 2002. "Mesmer, the Franklin Commission, and hypnosis: A counterfactual essay." *International Journal of Clinical and Experimental Hypnosis* 50, no. 4: 407-419.

Makrides, Vasilios N. 1999. "Zoikos Magnitismos (Mesmerismus) kai Orthodoxi Ekklisia tin periodo tou (neo) ellinikou Diaphotismou" ["Animal magnetism (mesmerism) and the Orthodox Church during the (neo) hellenic Enlightenment"]. In *Praktika Panelliniou Synedriou "Neoellinikos Diaphotismos (Apopeira mias neas erevnitikis syngomidis).",* 231-98. Kozani, 8-10 November 1996.

McConkey, Kevin M., & Campbell, Perry. 2002. "Benjamin Franklin and mesmerism, revisited." *International journal of clinical and experimental hypnosis* 50, no. 4: 320-331.

Miodoński, Leon. 2001. "Romantic medicine in Germany as the philosophical explication for understanding the world and man-Mesmer and mesmerism." *Med Nowozytnza* 8(2): 5-32.

Polyzoidis, Anastasios. 1818. "Ekthesis peri tou Zoikou Magnitismou" (An essay on animal magnetism). *Hermes the Scholar* 14: 349-359.

Stroumbos, Dimitrios. 1863. "On animal magnetism" (in Greek). *Chryssalis* issue 6 and issue 7, 179-181 and 210-213.

Vlahakis, George N. 1998. "The Introduction of Classical Physics in Greece: The Role of the Italian Universities and Publications." *History Of Universities-Oxford-* 14, no. 1: 157-180.

Vlahakis, George N. 1999. "The Greek Enlightenment in Science: Hermes the Scholar and its contribution to science in early nineteenth-century Greece." *History of science* 37, no. 3: 319-345.

Willis, Martin & Wynne, Catherine, eds. 2006. *Victorian literary mesmerism.* Vol. 160. Rodopi.

Winter, Alison. 1994. "Mesmerism and popular culture in early Victorian England." *History of science* 32, no. 3: 317-343.

Wrobel, Arthur, ed. 2015. *Pseudo-science and society in 19th-Century America.* University Press of Kentucky.

Young, David C. 1996. *The modern Olympics: A struggle for revival.* Baltimore: Johns Hopkins University Press.

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