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Imagining Worlds in Literature and Science
Works by Paul Valéry, Virginia Woolf, and Carlo Emilio Gadda

Nicola Giansiracusa

Orientadores: Profª. Doutora Ângela Maria Valadas Fernandes

Prof. Doutor Federico Bertoni

Prof. Doutor Brett Bourbon

Tese especialmente elaborada para obtenção do grau de Doutor no ramo de Estudos de
Literatura e Cultura, na especialidade de Estudos Comparatistas, com a atribuição do Título de
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Abstract

This dissertation provides a comparative study of three modern literary authors: the French Paul Valéry (1871-1945), the English Virginia Woolf (1882-1941), and the Italian Carlo Emilio Gadda (1893-1973). Their works are examined in relation to the main theories and discoveries of the physics of their years, mainly atomic theories, relativity, and quantum theories. The focal point of the investigation is the contemporary development, in literature and in science, of new world-views, and the role that imagination played in devising them.

Arguing that the process of establishing world-views addressed similar questions and possessed isomorphic features in literary and scientific practices, both pertaining to the same cultural matrix, I develop various frameworks derived from the physics to conduct a close reading of the literary texts, mainly pertaining to fiction. Each such framework is fine-tuned by analysing the possible direct connections between the authors' ideas and the specific physical theories. This also shows how scientific concepts are transformed, rediscussed, and adapted once they move to a different discourse.

Given the focus on world-envisioning and the role of imagination in my research, I use fictional worlds theory as the main methodological background over which to apply the frameworks. In particular, I elaborate on the possibility it offers of articulating how fictions can produce inferences that may lead to general ontological and epistemological conclusions for their fictional worlds, which in turn can be compared with the actual world. Through this science-inspired framework, I aim at presenting novel and insightful readings of the works of Valéry, Woolf and Gadda, all of which were experimental and unconventional for their time, thus showing a less known facet of their commitment

to the artistic exploration of reality. In addition, this leads me to investigate the epistemic role of literary imagination, as well as its possible hermeneutic uses.

Keywords: Twentieth-century Literature; Literature and Relativity; Literature and Quantum physics; Imagination; Fictional Worlds Theory.

Esta tese oferece um estudo comparativo sobre três autores literários modernos: o francês Paul Valéry (1871-1945), a inglesa Virginia Woolf (1882-1941), e o italiano Carlo Emilio Gadda (1893-1973). As obras destes autores são investigadas à luz das principais teorias e descobertas da física sua contemporânea, principalmente as teorias atômicas, a relatividade, e as teorias quânticas. O estudo foca-se no desenvolvimento, tanto na literatura como na ciência, de novas imagens do mundo, e na função que a imaginação desempenhou na elaboração dessas imagens.

Defendendo o argumento que este processo de criação de imagens de mundo abordava questões similares e tinha características isomorfas nas práticas literárias e científicas, ambas ligadas à mesma matriz cultural, o trabalho desenvolve uma série de quadros metodológicos baseados nas teorias físicas, para realizar uma leitura atenta dos textos literários, principalmente de cariz ficcional. Cada quadro é aperfeiçoado através da análise das possíveis relações diretas entre o pensamento dos autores e as teorias físicas em causa. Isto mostra também como os conceitos científicos são transformados, debatidos, e adaptados quando passam para um discurso diferente.

Uma vez que a minha pesquisa se foca na construção de mundos e na função da imaginação, a teoria dos mundos ficcionais é usada como metodologia geral sobre a qual são aplicados os vários quadros metodológicos. Em particular, a minha análise explora a possibilidade, que a teoria fornece, de articular como as ficções podem gerar inferências que podem conduzir a conclusões gerais sobre a ontologia e a epistemologia dos próprios mundos ficcionais, que por sua vez podem ser comparados com o mundo empírico. Através desta perspectiva de investigação, inspirada na ciência, procuro apresentar leituras novas e esclarecedoras sobre as obras de Valéry, Woolf e Gadda, autores que na

sua época se revelaram experimentais e não convencionais, e assim mostrar um lado menos conhecido das suas explorações artísticas da realidade. Adicionalmente, isto conduzir-me-á a investigar a função epistémica da imaginação literária, e os seus possíveis usos hermenêuticos.

Palavras-chaves: Literatura do século XX; Literatura e Relatividade; Literatura e Física Quântica; Imaginação; Teoria dos Mundos Ficcionalis.

Resumo longo

Esta tese oferece um estudo comparativo sobre três autores literários: o francês Paul Valéry (1871-1945), a inglesa Virginia Woolf (1882-1941), e o italiano Carlo Emilio Gadda (1893-1973), todos considerados como modernistas. As obras destes autores são aqui investigadas à luz das principais teorias e descobertas da física sua contemporânea, principalmente as teorias atômicas, a relatividade, e as teorias quânticas. O estudo foca-se no desenvolvimento, na literatura e na ciência, de novas imagens do mundo e na função que a imaginação teve na elaboração dessas imagens.

O ponto de partida da pesquisa é o argumento que, no início do século XX, este processo de criação de imagens de mundo abordava questões similares e tinha características isomorfas nas práticas literárias e científicas, uma vez que ambas as práticas pertencem à mesma matriz cultural. Nessa base, o trabalho desenvolve uma série de quadros metodológicos inspirados pelas teorias físicas, para realizar uma leitura atenta dos textos literários, principalmente de cariz ficcional. Cada quadro é aperfeiçoado através da análise das possíveis relações diretas entre o pensamento dos autores e as teorias físicas em causa, seguindo os indícios textuais e os possíveis canais de transmissão destas informações; segue-se assim a metodologia decorrente da “field of force theory” (teoria do campo de força), da área de estudo da literatura e ciência, proposta por Katherine Hayles e aperfeiçoada por Michael H. Whitworth. Neste sentido, o exame textual quer também mostrar como os conceitos científicos são transformados, debatidos, e adaptados quando passam para um discurso diferente.

Uma vez que a minha pesquisa se foca na construção de mundos e na função da imaginação, a teoria dos mundos ficcionais é usada como metodologia geral sobre a qual são aplicados os vários

quadros metodológicos. Concretamente, a análise explora a possibilidade que a teoria fornece de articular como as ficções, e em particular as ficções literárias modernistas, podem gerar inferências que conduzam a conclusões gerais sobre a ontologia e a epistemologia dos próprios mundos ficcionais, que por sua vez podem ser comparados com o mundo empírico. Estas qualidades caracterizam a ficção modernista, muitas vezes concebida como um tipo de experiência mental.

Através desta perspectiva de investigação, inspirada na ciência, procuro apresentar leituras novas e esclarecedoras dos trabalhos de Valéry, Woolf e Gadda, autores que na sua época se revelaram experimentais e não convencionais, e assim mostrar um lado menos conhecido das suas explorações artísticas da realidade. Adicionalmente, isto conduzir-me-á a investigar a função epistémica da imaginação literária e os seus possíveis usos para uma hermenêutica do texto literário. Neste sentido, a imaginação é entendida seja como reflexão sobre situações que não se realizam na realidade, seja como reprodução dos caracteres experienciais dessas situações.

Além duma introdução (que explica a metodologia) e duma conclusão, o trabalho está dividido em três secções. A primeira secção, intitulada “Mente e Matéria”, apresenta os autores literários, tendo em conta particularmente as suas considerações, expressas na sua obra ficcional e não ficcional, sobre os entrelaçamentos entre mente e matéria. Lembrando as inovações na física que conduziram à aceitação do modelo atómico da matéria, e propuseram uma equivalência entre matéria e energia, analiso várias metáforas usadas pelos três autores para ligarem fenómenos mentais e físicos numa perspectiva epistémica. Estes quadros permaneceram produtivos, e foram adaptados de várias formas, ao longo das respetivas carreiras. Esta secção é, portanto, a mais geral do ponto de vista teórico, e a menos ligada à teoria dos mundos ficcionais. Após uma introdução das teorias físicas no capítulo 1.1, o capítulo 1.2 introduz o estudo de Paul Valéry e das suas ideias iniciais na pesquisa sobre a mente, ligadas especialmente à termodinâmica, e às suas evoluções. Os principais textos analisados são *Cadernos* (1894-1945), *Introdução ao método de Leonardo da Vinci* (em três versões: 1895; 1919; 1931), e *Monsieur Teste* (publicado em 1896; 1926; 1931; e póstumo em 1946). O capítulo 1.3 discute a função metafórica e analógica do conceito de átomo na teoria e prática literária da Virginia Woolf,

analisando também alguns dos seus contos breves escritos ao longo de vários anos. A análise mostra em particular o papel das teorias atômicas na descrição das relações eróticas entre seres humanos, com ênfase na sua natureza material. O capítulo 1.4 é dedicado à filosofia sistêmica de Carlo Emilio Gadda, desenvolvida em estreita relação com a física, e o uso que Gadda faz dessa filosofia na redefinição do conceito freudiano de *libido* como principal ator na história humana. Neste sentido, o foco principal do capítulo é o texto não-ficcional *Eros e Priapo* (1944-45), e o seu modelo físico-freudiano, fundamental para o enquadramento de todas as interpretações de Gadda.

A segunda secção, com o título “Literatura e Teoria da Relatividade”, é dedicada à teoria da relatividade nos seus vários desenvolvimentos, e particularmente como teoria do *continuum*. O capítulo 2.1 introduz a teoria e discute o papel da imaginação na sua elaboração. O capítulo 2.2 é uma análise de *Eupalinos ou O arquiteto* (1921) através da interpretação pessoal de Valéry da relatividade geral, com uma ênfase na perspectiva, na simetria entre corpo, mente e mundo, e na propriocepção seja na criação artística, seja na experiência do mundo. Neste sentido, o capítulo introduz o conceito de imagem espaço-temporal, entendida como um objeto ou uma situação cuja forma permite inferir a estrutura do mundo em que está localizada. O capítulo 2.3 estuda *Rumo ao Farol* de Virginia Woolf (1927) através de um quadro baseado no espaço-tempo de Herman Minkowski e utilizado de várias formas na filosofia inglesa. Os focos principais são as representações do espaço-tempo na experiência da realidade, na memória, e na relação humana com o passado e a morte. A simetria e a continuidade entre corpo, mente e mundo desempenham aqui também um papel importante, e a criação artística torna-se uma forma de produzir imagens espaço-temporais, quer ao nível da intriga ficcional (em que uma personagem, Lily Briscoe, pinta um quadro), quer no caso da própria estrutura do livro. O capítulo 2.4 examina *A Adalgisa* de Carlo Emilio Gadda (1943, publicada com data 1944) do ponto de vista da relatividade geral, para mostrar por um lado como Gadda satiriza a burguesia de Milão, a sua cidade natal, e o seu excesso de confiança, através de imagens espaço-temporais, e por outro lado como Gadda tenta evidenciar algumas características que permanecem invariáveis na contínua reconfiguração do sistema geral do mundo.

A secção 3, intitulada “Literatura e Física Quântica”, propõe o estudo das relações entre as obras dos autores em causa e as teorias quânticas, especialmente do ponto de vista da descontinuidade. O capítulo 3.1 é dedicado à exposição das teorias, da sua história, e da função das experiências mentais nelas. O capítulo 3.2 estuda *O meu Fausto* de Valéry (1944-45) especialmente em relação ao conceito da função de onda; discute-se o modo como esta função matemática permite conceptualizar a ideia de possibilidade na estética e na experiência humana. O capítulo trata também a questão da crise da imaginação que a física quântica causou na ciência, e as possíveis soluções literárias para representar, na sua falta de lógica, a possibilidade não realizada e as fraturas na estrutura ontológica do mundo: estas “imagens quânticas” vão ser utilizadas também nos capítulos seguintes. O capítulo 3.3 investiga *Entre os atos*, a última novela da Virginia Woolf (1941), utilizando o conceito de complementaridade quântica do físico Niels Bohr, para conceptualizar uma semelhante complementaridade entre ficção e facto (entendidas como idealizações) que a novela apresenta, e que influencia as ações e a história humana, bem como a possibilidade e a função política de interromper uma ficção para reconfigurá-la como facto ou vice versa. O capítulo 3.4, enfim, considera o romance policial *Aquela confusão louca da Via Merulana* (1957), de Gadda, através da indeterminação quântica, para destacar o papel da casualidade na ontologia deste mundo ficcional, a perturbação epistemológica que provoca, e as consequências éticas que dela derivam.

A Conclusão resume os resultados da investigação, propondo uma leitura da literatura modernista como dividida entre os ideais de continuidade e descontinuidade. Finalmente, sublinha-se a complexidade das transformações dos conceitos científicos que passam para a literatura.

Palavras-chaves: Literatura do século XX; Relatividade; Física Quântica; Imaginação; Teoria dos Mundos Ficcionalis.

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To my parents, without whom I wouldn't have had the courage to leave home. And to Isabella, who brought home with her back to me.

Note to the text

This dissertation is based on the Chicago “author-date” style of quotation, with a few exceptions.

Those works by Gadda and Valéry that are quoted from collective editions, Valéry’s manuscripts, and all works by Woolf are cited according to abbreviations: see the “Works Cited” section, 348-352.

Considering the authors’ peculiar uses of punctuation, I have kept, in quotations from the original texts, those punctuation marks that do not normally figure in English, such as the *guillemets*. I have nonetheless adapted the position of the punctuation to the Chicago style (for example, commas and full stops come before inverted commas, and there is no space between commas, colons, semicolons, and the preceding words). I have also uniformed the length of all dashes (presented as “—”).

Ellipses in quotations are given as three spaced dots “. . .” whereas three (at times four) close dots such as “...” are to be considered as part of the original texts.

The main literary works are always quoted in the original language, with the translation in the notes. The same goes for all texts that do not have a published translation available. Translations of titles of books, journals, artworks etc. are given in text, bracketed and between inverted commas. If not stated otherwise, the translations are mine.

Introduction

In his now famous *The Structure of Scientific Revolutions*, Thomas Kuhn connected the passage from one scientific paradigm to another to a shift in the very nature of the scientists' experience of reality. Even though nothing is really altered in what we could bluntly call the outside world, "paradigm changes do cause scientists to see the world of their research-engagement differently . . . we may want to say that after a revolution scientists are responding to a different world" ([1962] 1996, 111). Kuhn made his point by drawing a loose parallel with modifications in *Gestalt*: "What were ducks in the scientist's world before the revolution are rabbits afterwards" (111). Through a wealth of examples, he dedicated several pages to put across that it is not simply a matter of giving new interpretations to the same objects that are observed and experimented on, but of a distinct experience, of *looking* at the same thing and *seeing* something different.

If the aftermath of a scientific revolution leaves out a new world ripe for the experimental picking, the case is quite more striking when such revolution is in act, and the dust of the theoretical scuffles is yet to settle. A similar predicament is well represented by the situation of physics in the first decades of the 20th century. The turn of the century saw the discovery of X-rays and radiations, which were entirely new phenomena; few years later, the existence of atoms was confirmed, and their structure was conjectured to be composed of even smaller particles leaving void space between them; between 1905 and 1916, Albert Einstein proposed the field-defining theory of relativity; finally, quantum theory, developed by various physicists since 1900, posed an utter refusal to the main tenets of about three hundred years of classical physics. It obtained a coherent, yet still unstable, form around 1927 by hinging upon an epistemological impasse (known as the wave/particle duality). All these

new conceptions revolutionised the Western idea of the universe again and again in a very short time. They led to different and contrasting world-views, whose premises were not necessarily based on what was observed but, oftentimes, on what was not even observable. Despite the term “views,” the issue rested mostly on imagination: in Einstein’s case, for example, the image of the very fabric of reality that he proposed started as entirely theoretical and was exposed through thought experiments: he rested assured that experimental confirmation would soon follow; in the case of quantum mechanics, the radicality of the change was such that the very idea of trying to mentally visualise what went on in the subatomic realm was challenged altogether, sparking various related debates.

That imagination played a part in, or at least resulted from, the making of science was both acknowledged by the insiders and communicated to society at large. Thus, to give a few examples, the philosopher and mathematician Alfred North Whitehead opened a 1925 conference on relativity admitting that “scientific theory is outrunning common sense . . . Heaven knows what seeming nonsense may not to-morrow be demonstrated truth. We have recaptured some of the tone of the early 19th century, only on a higher imaginative level” ([1925] 1967, 115-16). In his *ABC of Relativity* (1925), trying to make the theory understandable to the general public, Bertrand Russell asked to imagine such things as waking up at night on a balloon surrounded by exploding fireworks (4), looking and being looked at by someone on Sirius (62), or measuring distances with a live, wriggling eel (117-18). He also strived to describe the space-time continuum of general relativity as a hilly terrain, eventually throwing in the towel and specifying that “the hill is in space-time, not in space (I advise the reader not to try to picture this, because it is impossible)” (129). In a 1927 essay, the geneticist J. B. S. Haldane described the various “possible worlds” that science was able to conceive and visualise, from the weird planes of non-Euclidian geometries to the kind of reality experienced by a dog, a bee or a barnacle. Moving to quantum mechanics, he commented:

The attempt to build up a world-view from the end which common sense regards as wrong, is, at any rate, being made, and with very fair success. I suspect that it is of far greater importance for metaphysics than the

entire efforts of the philosophers who, from Kant onwards, have attempted to build on the ground cleared by Hume. (1930, 284)

Haldane concluded by guarding his reader against strict systematisations, given the probability “that the universe is not only queerer than we suppose, but queerer than we can suppose” (286).

My research started from a fascination with the imaginative side of those years’ physics and the challenges that it posed, and it developed from an initial sense, now grown into confidence, that literature was then dealing with, and trying to express, much similar issues: the crumbling of old assurances, new relations between inner feelings and the outside, the role of immateriality in experience; in short, the challenges posed by the feeling of being in a different world than the one previously imagined as true. In what follows, I will use the concept of imagination to analyse the direct and indirect relations with physics in the fictional work of three literary authors: Paul Valéry (1871-1945), Virginia Woolf (1882-1941), and Carlo Emilio Gadda (1893-1973). I classify these authors as modernists *lato sensu*, both for the experimental qualities of their work and for the nature of their interests.¹ The main point of inquiry will be the kind of world-views that stem from some of their works, with the ontological and epistemological questions that they posed. I will discuss imagination in a bit, but I can already anticipate that, starting from Kuhn’s work, I consider world-views as sums of experiences (either actual or imagined, and by no means limited to the visual aspect) that are linked together and acquire meaning and complexity in their mutual connections, and from which can derive a certain sense of being in, participating in, and making sense of, the world and its various (natural and cultural) manifestations: a *Weltbild* that can be connected to a *Weltanschauung*.

¹ While this designation should pose no doubt for Woolf, Gadda and Valéry are much less classifiable authors. While Gadda has been sometimes taken as a postmodernist, Raffaele Donnarumma (2006, 7-28) has made a clear case for his pertinence to modernism. Less certainty can be assured for Valéry, although there are voices in favour, e.g., Steven Cassedy (1986). While his poetry is set at the endpoint of symbolism, I would say that his prose work (which will be my object of analysis) can more easily be considered as genuinely modernist, for the variety of its solutions, the high stakes of its aesthetics, and the interest in the nature of reality and of the human psyche. I hope that, through my comparison with the other two authors, my less confident reader will share my view by the end of this thesis.

A similar idea was expressed by Einstein in his lecture “Geometry and Experience,” published in 1921. Right before introducing his model of a finite but unbounded universe (indeed an imagined one, as it will be disproved by Edwin Hubble in 1929), Einstein discussed what it means for a complete theory to be visualised:

First of all, an observation of epistemological nature. A geometrical-physical theory as such is incapable of being directly pictured, being merely a system of concepts. But these concepts serve the purpose of bringing a multiplicity of real or imaginary sensory experiences into connection in the mind. To “visualize” a theory therefore means to bring to mind that abundance of sensible experiences for which the theory supplies the schematic arrangement. ([1921] 2002, 217)

It seems intuitive that a similar definition could be extended to the reading of a story, if we try to “visualise” it in its entirety and, as Woolf once wrote, to “hold the book clear, secure, and (to the best of our powers) complete in our minds” (*D* 4:397), but it will take the rest of this introduction to precise this argument. So doing will lead me to describe my work’s methodology, devised to optimise textual interpretation in light of parallels between literature and physics. This will take three main stages: the relations between literature and science, the nature and role of scientific and literary imagination, and the specific literary framework of fictional worlds theory. A key concept will be the idea of literature, and modernism in particular, as a kind of thought experiment.

Literature and Science

After Charles Percy Snow’s 1959 claim that science and humanities represent “two cultures” which “had almost ceased to communicate at all” having almost nothing in common intellectually (1998, 2),² the interdisciplinary study of literature and science, especially after its restructuring since

² On the debate sparked by Snow at the time, see for example Thiher (2005, 5-11).

the eighties with the help of science studies, history and philosophy of science,³ has led to the rightful assurance that both fields pertain to the same cultural matrix. This should not necessarily induce to recall the poststructuralist tenet of language as universal medium which caused reactions on the scientists' part, like the Sokal's hoax leading to the so-called "Science-wars" of the nineties.⁴ Indeed, as Allen Thiher wrote, the cultural matrix is rather an "empirical notion" (2005, 1): being embedded in the same historically situated culture, both science and literature tend to share similar preoccupations, and to express them in different but connected ways. Gerald Holton would call such preoccupations the "thematic components" of scientific thought (1973), and Gillian Beer would propose that, in their various cultural formulations, humanities and sciences share an "*intimacy* between intellectual issues and emotional desires and fears" (1996a, 8). It is not uncommon to find scientists partaking of such a point of view, especially at the time of our interest: Katherine Hayles drew the notion of a general "climate of opinion' that makes some questions interesting to pursue and renders others uninteresting or irrelevant" (1984, 22) from Whitehead, who tried to describe the history of science in relation to its contemporary culture. Erwin Schrödinger, one of the protagonists of the quantum revolution, said something equivalent in 1935 with regards to which scientific experiments are chosen as most optimal (1935, 69-70), to show that "civilisation forms an organic whole" and scientists are "children of their age" (80). This idea helps justifying Einstein's own philosophical (at times metaphysical) interests in the relations between human theorisation and nature (of which the one quoted before is but a sample), as well as Niels Bohr's well-known linguistic preoccupations – which led to Aage Petersen's interpretation of Bohr's philosophy as centred on the

³ The turning point tends to be identified with George S. Rousseau's 1978 article "Literature and Science: The State of the Field." For a general history of the field, see Meyer (2018).

⁴ To mock the postmodernist critiques of scientific objectivity, Alan Sokal proposed a nonsensical article to the academic journal *Social Text*. After getting accepted and published, he revealed that it was a spoof, thus generating a lively debate around the topic. Whether or not we accept Sokal's method as legitimate, it seems unquestionable that a proper transdisciplinary discussion was much needed: today, along with analyses by humanists, the field hosts an increasing number of positive and constructive interventions by professional scientists. On the story of the Sokal's hoax, see Jardine and Frasca-Spada (1997); and more briefly Crawford (2018, 120-21).

idea that “[w]e depend on our words. We are suspended in language” (1963, 10). Both these preoccupations, which shaped the two scientists’ methodologies, are as much related with science as with larger cultural issues.

Bohr’s case especially calls for the parentage of science with literature in times of theoretical revolution. As claimed by Andrea Battistini, while science normally aims to find simple and general rules, in times of paradigmatic shifts “essa tende ad avvicinarsi molto di più al modo di procedere della letteratura, perché, volendo rovesciare verità sclerotizzate, fa vedere i fenomeni in modo straniante, con occhi diversi” (2003, 29).⁵ This also leads to a much greater preoccupation in terms of linguistic exposition. Reception, in such cases, tends to be similarly oriented towards the fictional mode, as stated by Gillian Beer for the case of the Darwinian revolution: “When it is first advanced, theory is at its most fictive. The awkwardness of fit between the natural world as it is currently perceived and as it is hypothetically imagined holds the theory itself for a time within a provisional scope akin to that of fiction” (2009, 1).⁶ This helps the case for postulating integrations and/or parallelisms between science and literature in early 20th century Europe. Importantly, modernist authors posed at the core of their art pressing epistemological and ontological questions, which imposed an all-encompassing attitude that made their work “inherently subdisciplinary or transdisciplinary in its operation” (Vargish and Mook 1999, 4). As written by Allen Thiher,

Modernists wanted to know the world, or at least great expanses of the world, at the same time they interrogated the possibilities for knowledge. Rejecting the limits imposed on fiction by a preceding generation of realists, modernist fiction was predicated on the assumption that nothing is excluded from literature. (2005, 211)

⁵ “[I]t tends to get much closer to literature’s way of proceeding since, wanting to overthrow sclerotised truths, it shows phenomena in an alienating way, through different eyes.”

⁶ Haldane, in the essays which I have already quoted, half-jokingly wrote that quantum theories “begin where the Red Queen in *Through the Looking Glass* left off” (1930, 270).

That said, scholarship in the field of literature and science comes in a wide variety of themes and methodologies: even if we limit ourselves to the relations between modern literature and physics, there is no single route for research. While, as highlighted by Michael Whitworth, most academic output used to be developed in the form of collections of short essays on a variety of topics (2001, 2), there have been more compact works by single authors or written in collaboration, one of the first notable cases being Alan Friedman and Carol Donley's *Einstein as Myth and Muse* (1985). I am not going to list all such accounts, as they are going to come up throughout my research. Nonetheless, to speak very generally, the strategies which guide works on twentieth-century physics and literature include dividing the science in themes and gather a wide range of examples for each (the quoted Friedman and Donley [1985]; Vargish and Mook [1999]; and Whitworth [2001] are such cases); focusing on one, or at most two closely related, authors (we will see many such cases); or taking a slightly higher number of authors, to each of whom a single section is dedicated (Hayles [1984]; Thiher [2005]; Antonello [2005]; and for poetry Albright [1997]). My approach is midway between these views: first, I want to highlight what kind of world-views come out of each single work, privileging in-depth literary textual analysis over general overviews; secondly, I want to show how the authors' works evolve in time, portraying different literary worlds in various moments, which can be connected to different physical theories or themes; thirdly, I want my analysis to be comparative, presenting not three parallel paths but rather three main branches that are variously intertwined and thus can be better understood together.

The occurrence of a general paradigm change in the 20th century has been highlighted, among others, by Katherine Hayles, in her *The Cosmic Web: Scientific Models and Literary Strategies in the 20th Century* (1984). Analysing works that ranged across the whole century, but with a special attention to postmodernism, Hayles argued for a shift towards a field concept. The latter could be represented by the idea of a common and continuous web that connects everything and in which the subject is inevitably included, or rather "captured" (21), its own individuality now challenged. Language itself, being part of the field, became implicated in this new dynamics in which a

subject-object divide is no longer assured. The key point of Hayles's work is that the concept allows to see "isomorphic" (9) features in science, literature, and other cultural expressions. While Hayles drives her point home within a long span of years, I chose to focus on works that were published or written from the end of the 19th century until 1945 (before the atomic bomb turned theory into an all-too-real issue).⁷ In that period, the theoretical situation in physics was much less stable. On one hand, relativity proposed itself as the coronation of classical physics, indeed a field model in which, however, the observing subject could manage to find those relations that were valid from all reference frames, thus maintaining classical objective determinism. On the other hand, quantum physics at its inception focused on the possibility of a radical discontinuity, the opposite of a field, at the very core of existence, showing that determinism could not hold at a subatomic level. Indeed, this brought about the question concerning the implication of the subject in the object of study. Yet, the idea of considering the field as more fundamental than the particles was but one of the possibilities on the table, and only the special theory of relativity, not the general, could be connected to quantum mechanics by the end of the twenties. I hope to show that similar uncertainties between continuous and discontinuous frameworks are also consistent with the work of Valéry, Woolf and Gadda.

In trying to understand how imagination is involved with epistemological and ontological claims, and how literature parallels science in such terms, Hayles' notion of isomorphism is fundamental. However, finding isomorphisms cannot be an end in itself (as it is, for example, for Vargish and Mook [1999]): not only is this not suited for in-depth analysis, but it also brings with it an impending danger of circular reasoning. Hayles, in fact, took isomorphism as nothing but a starting point in her research, and even stated the problem clearly later on.⁸ Rather, isomorphism is important as a means. Along

⁷ With one notable exception, Gadda's *Quer pasticciaccio brutto de Via Merulana* ("That Awful Mess on the Via Merulana"; 1957). My reasons for the choice are various: apart from the fact that the novel is set in 1927, its composition represents the final stage of a series of meditations that started at least around that same year, and the writing of its first form began in 1945.

⁸ "In the past, studies in literature and science have tended to follow a characteristic pattern. First some scientific theory or result is explained; then parallels are drawn (or constructed) between it and literary texts; then the author says in effect Q.E.D., and the paper is finished. In my view, every time this formula is used it should be challenged: What do

with the concept of cultural matrix, it allows to compare formal structures, modes of exposition, and even aesthetic conceptions between different fields of inquiry without the absolute need to figure out direct connections. It thus provides the possibility to find in scientific theories a model to construct frameworks for the analysis of literary world-views. However, once that possibility is proven viable, direct connections can be used to fine-tune those same frameworks. Scientific theories can be, after all, rather sizable constructs: they can include a variety of hypotheses and parallel formulations, a wealth of specifics, and quite a lot of contentious points, usually in proportion to their revolutionary character. At times, they allow for different possible solutions: such was the case for the interpretation of the structure of the universe according to general relativity. Moreover, theories can reach authors at various levels of specificity, from proper scientific papers, to conversations, to popular expositions, journals, and newspapers.

Even if they are not a prerequisite for research, the more these direct relations can be postulated, the more precise the framework of analysis will result. Whitworth has adapted the model of the “field of force” to better allow for a similar methodology. In his words, if a “*zeitgeist*” model tends to be too wide to produce results,

the ‘field of force’ has the advantage that it allows us to model both dissemination and impermeability. For the model to be useful, we must understand the field of force as being propagated through a heterogeneous, discontinuous medium . . . Like the *zeitgeist* model, it allows us to ascribe scientific knowledge to an author in the absence of particular reports of reading or of conversations. Moreover, in those cases where we have fragmentary evidence of scientific knowledge, it allows us to understand its larger significance. However, the model forces us to map the medium of propagation, noting the material paths through which the ideas could have been transmitted: we cannot assume that an entire society would have been saturated uniformly in the new knowledge. (2001, 18)

the parallels signify? How do you explain their existence? What mechanisms do you postulate to account for them? What keeps the selection of some theoretical features and some literary texts from being capricious? What are the presuppositions of the explanations you construct, and how do they connect with what you are trying to explain?” (1991, 19).

To keep up with the analogy, we could envision each author as a charged particle generating an attractive field whose lines of force, representing the transmission of knowledge, would vary according to differences in the medium's composition. For example, while it is highly improbable that Woolf would have read Einstein's original papers, it is much more likely that she would have participated in conversations about relativity within the Bloomsbury group (and indeed, she recounts at least such an instance: see ch. 2.3, 166). Inevitably, this method makes my research strongly focused on the historical context: not only is it necessary to know the theories in themselves, but also in their contemporary modes of exposition and dissemination. What today is considered salient or fascinating about quantum mechanics or relativity is not necessarily what scientists and laypeople focused on at the time of the theories' development. The same preference should be given to the literary authors' own theories – in our case on literature, science, and imagination – as expressed in their non-fictional writings. Thus, as a rule, theorisations and expositions contemporary to the authors will be privileged over subsequent ones.⁹

The variability of the “medium of propagation,” as Whitworth calls it, leads us to the issue of direct influence. This was the main model used for studies in literature and science before the eighties, yet it has afterwards been criticised because, apart from being often inapplicable, it seems to assign literature to a subordinate position. Again Hayles, among others, has voiced this preoccupation: “The premise that influence flows from science to literature implicitly valorizes science as the source of truth to which literature responds” (1989, 317). At times, this leads to research on the parallel influence of literature over science, but the results tend to be less satisfactory as we move towards the

⁹ The main exception will be my references to Karen Barad's Bohr-inspired philosophy in ch. 3.4. This is motivated, first, by the sound historical perspective of Barad's work with respect to the Niels Bohr's philosophy, which I will emphasise over her own and, secondly, by the close parallelisms with Gadda's own philosophy, which greatly help distinguishing some of the latter's focal points.

contemporary period and its scientific institutionalisation.¹⁰ Nonetheless, I would argue with Rachel Crossland (who also profits from Whitworth’s field of force) that “the reaction against influence studies . . . has perhaps gone too far . . . There *are* cases in which influence can be shown to be the most appropriate term” (2018, 5). While modern scientific research tends towards hyper-focalisation, literature is all-inclusive. Most importantly, then, I would stand by Dirk Vanderbeke in his response to Hayles’ quoted claim: “Literature is not an empty vessel into which external truth can be poured but rather a predator, searching for suitable matter which it can transform for its own purposes, frequently almost beyond recognition” (2011, 197).

I could not emphasise transformation enough. As stated by Gillian Beer, it is transformation, rather than translation, that takes places when scientific concepts reach literature: “Genres establish their own conditions which alter the significance of ideas expressed within them. When concepts enter different genres they do not remain intact” (1990, 90). Therefore, “[t]o discover the effects of scientific activity in literary works we need to look not for explanatory or systematic discussion but rather for ironic doubling of reference or the disturbing of authoritative story” (96). Whatever the channels of transmission, the study of such transformations will provide key points to the interpretation of the texts.

Taking all that has been said into account, my research will focus on in-depth textual analysis of literature through frameworks drawn in parallel with physics, hinging on the isomorphic features between the two but also considering direct relations in various guises. It will use the method of the field of force to fine-tune the frameworks, and emphasise the transformative character of literary works. This has also guided the choice of my authors: all three of them lived through the mentioned revolutions in physics, yet they had different levels of knowledge. As I will show throughout the work, Valéry was autodidact, yet knowledgeable and engaged enough to discuss with some of the

¹⁰ A recent example of such research is Catriona Livingstone’s theory of a “feedback loop” between science and literature (2018), which however leaves points of contention (I would say mainly on the historical side), and indeed is not taken up in her successive work (Livingstone 2022).

main physicists of his time; Woolf had no mathematical knowledge, but these topics were of interest for the Bloomsbury group and the larger community; Gadda was an engineer with mathematical and technical expertise, but he read of the new discoveries mainly through popularisations. In addition, they were all interested in the relations between human mind and external world in ways that put them in conversation with contemporary science. Finally, they all responded both to their respective national context and to a larger European one, both in science and in literature.

I will now move to the issue of how to specifically connect physics and literature under the theme of world-envisioning. To do this, I will briefly sketch an account of imagination, then apply it to literary analysis through fictional worlds theory.

The Role of Imagination in Literature and Science

Even though I have been talking freely about scientific and literary imagination, it must be said that the concept is far from clear. Imagination, especially if linked to visualising something in the mind, has looked (and indubitably to some still looks) quite dubious in its foundations. Therefore, even though, as it will be seen, my own investigation is not heavily reliant on empirical studies such as cognitive psychology and neuropsychology, I will now spend a few words to highlight the empirical foundations of imagination and the interest for its role in science and literature.

First, a couple of definitions. Following the general trend, I use the term mental imagery, or mental images, in the sense of perceptual representations which do not involve actual external stimuli.¹¹ Although the wording makes one think of visual mental representations, mental imagery includes all sensory modalities. Moreover, it can come either consciously or unconsciously (e.g. in dreams, intrusive thoughts, so-called “earworms,” and so on). The phenomenological character of mental imagery has led to its refusal as an object of study in cognitive psychology for many years.

¹¹ A good summary on the topic is provided by Bence (2021).

By the end of the seventies, new interest was sparked by a debate around whether mental images could actually be depictive at all, or were rather always linguistic in nature. The advent of neuroimaging techniques, however, has shown that large parts of the brain involved in perception are equally active during mental imagery, and that temporarily impairing their functioning obstructed both activities. These and other findings point to the fact that, while cognition can come in many formats, the perceptual nature of mental imagery seems empirically undeniable (Pearson and Kosslyn 2015).

Imagination, on the other hand, is generally considered as the conscious activity of representing or reflecting on objects or state of affairs that do not (and at times could never) correspond to immediate reality, i.e., “without aiming at things as they actually, presently, and subjectively are” (Shen-yi and Gendler 2020).¹² Somewhat paradoxically, imagination does not necessarily require images: Kendall Walton, for example, sustains that “imagining can occur without imagery” (1990, 13), both generally and in fiction. In this sense, it is traditional to distinguish between *objectual* or *imagistic* imagination (imagining something) and *propositional* imagination (imagining that something is the case): the former is taken to be akin to perception, whereas the latter entails an attitude towards a proposition, and as such seems to pertain to linguistic cognition (Shen-yi and Gendler 2020).

These debates show that mental imagery and imagination are being discussed both philosophically and empirically as valuable concepts in the study of cognition. This has a parallel in the philosophy of science: imagination has received more and more attention in the last years. Although its cognitive role is being increasingly recognised both in scientific discoveries and for

¹² The possibility of unconscious imagination is not excluded by all researchers (in literary studies, for example, Kendall Walton somewhat collapses mental imagery and imagination [1990, 13 ff.]), but the position is minoritarian: see for example the overview by Amy Kind (2021).

scientific exposition,¹³ the contribution of mental imagery proper (and thus of the experiential side of imagination) is still an object of contention.¹⁴

This recent trend parallels older considerations and debates among the physicists in early 20th century. Einstein, as we have seen from his previous quotation, seemed to have no doubts about the role of visualisation in theoretical physics: to him, mathematical language applied to physics led to the connection of different sensorial experiences in the minds of the scientists. Four-dimensional spacetime, however, was not easily visualisable. Quantum theories posed an even more serious problem to visualisation. In Germany, to give an example analysed by Jennifer Burwell (2018, 74-91), this sparked a heated debate over the importance of the visualisability (*Anschaulichkeit*) of a scientific theory, with Schrödinger on the side of requirement, Werner Heisenberg on that of uselessness, and Bohr somewhat occupying a middle ground.

While the importance of imagination in science remains an object of debate, literature, fiction, and the arts have always been associated with it. However, the decoding of a written text too, as we have seen in Walton's case, can be taken as a matter of either propositional or imagistic imagination.¹⁵ After the Romantic period and until empirical analysis in cognitive studies, the imagistic side has been somewhat downplayed, with some exceptions (see Richardson 2015, 225 ff.). One of such exceptions is Elaine Scarry's *Dreaming by the Book* (first ed. 1999) which focused on how the

¹³ Alice Murphy (2022) gives an overview of recent debates. Some of the participants will be quoted *infra*.

¹⁴ Salis and Frigg (2020), for example, argue that scientific models and thought experiments only require propositional imagination to function. Murphy (2020b) has responded to the claim by arguing for a pluralistic account of the kinds of imagination used in science.

¹⁵ It should be noted, nonetheless, that even in this case, recent empirical studies lead to blur this distinction. For example, De Groot (2016) has used eye tracking to time the effects of semantic and visual stimuli in image searching tasks, while Noorman, Neville, and Simanova (2018) have applied electroencephalography to see how and how fast linguistic labels influence shape recognition. As summarised by Bence (2021), the extremely fast response to semantic representation in visual tasks (under 100 milliseconds) seems to prove that “imagistic and linguistic cognition are far from being independent from one another – they are deeply intertwined even at the earliest levels of perceptual processing.”

production of moving mental imagery in literature is enhanced by particular techniques,¹⁶ and guided by the narrator's covered instructions. To Scarry, literature generates a specific environment in which imagination finds its most fertile terrain:

Through a mimesis of givenness, the quality of instruction in a poem or prose narrative brings about a radical change from daydreaming to vivid image-making. The vibrancy of perception – the rush of color, the spill of light, the thrilling density or discontinuity of sound – is less likely to be duplicated during undirected daydreaming than when dreaming-by-the-book. Our freely practiced imaginative acts bear less resemblance to our freely practised perceptual acts than do our constrained imaginative acts occurring under authorial direction. (2001, 31)

If Scarry's account was mainly based on the phenomenological side of literary immersion, G. Gabrielle Starr, among others, has more recently focused on the neuropsychological effects of aesthetic experience. In particular, starting from Samuel Moulton and Stephen Kosslyn's theory that imagery can have epistemic functions as mental emulation (2009),¹⁷ Starr extends such value to aesthetic imagination. In doing this, Starr takes Scarry as a base – since she focused especially on the dynamic side of aesthetic imagery – and shows that the sister arts generate a kind of mental imagery that is not only multisensorial, but also strongly linked to motor imagery, thus to the imagination of bodily movements in space: “Motor imagery both integrates a variety of sensory information and is at the heart of a variety of kinds of sensory imagery” (2013, 91).

¹⁶ These include privileging elements that reflect or produce light or are vividly coloured (radiant ignition); rarefied objects such as tents or gauzes (rarity); suddenly adding and subtracting images to create movement, posing elements that stretch, tilt, fold; focusing on circular movements and rotations; and adding flowers or flower-like elements, which possess most of the previous characteristics.

¹⁷ In the two researchers' words, emulation is different from instrumental simulation in that “whereas instrumental simulations can be thought of as first-order simulation (in that they imitate content), emulations can be thought of as second-order simulations (in that they imitate the processes that change content as well as the content itself)” (2009, 1276). This inevitably links emulation to mental imagery, as placing oneself, as they say, in the “mental shoes” (1276) of someone includes calling forth the kind of perceptions experienced in that situation.

I have recalled this material to assert the importance of mental imagery in literature and show empirical evidence towards its epistemic usefulness. It should be clarified that I have no doubt that propositional imagination plays a fundamental role in the kind of cognitive activity that we engage with in literature or in scientific research. Yet, I cannot see how this would exclude both the presence of and a role for imagistic imagination.¹⁸ The two, rather, should be considered as working together, and in general intertwined, with variable degrees of relative importance. Based on what has been said, and limiting the discourse to literary fiction, I find a few initial epistemic functions for the controlled kind of mental imagery that the latter sparks: first, as Scarry investigated, literary imagination can lead to different degrees of vividness, depending on the attention that certain objects or sensations receive in a text (through description and hypotyposis, metaphors and analogies, multiple points of view, and all the rhetorical tools that literature can deploy). It thus helps developing a hierarchy in the information, inevitably guiding the readers to focus on certain elements of the text, and their perceptual aspects, more than others.

Secondly, drawing on Starr's research, visual imagination is required to navigate the chronotope of a fiction from an embodied point of view, which is imperative for textual comprehension and interpretation and brings with it a wealth of inferential possibilities (this will be particularly important in analysing relativity and literature). Thirdly, as will be seen in various cases, intratextual and intertextual relationships between fictional elements sometimes require (indeed ask) to be drawn on the basis of their common sensory features: such analogical process is more linked to proper image-comparison than to propositional attitudes.

¹⁸ My claim, however, inevitably leaves out those particular and still debated cases in which a person completely lacks visual mental imagery, and which has been recently termed *aphantasia* (Zeman, Dewar, and Della Sala 2015). More generally, at the opposite ends of the imaginative spectrum are conditions that can completely alter the experience of reading, including synaesthesia and actual hallucinations, and which have recently been considered by Matthew Rubery (2022). In the impossibility of covering those particular situations, I would rather refer to a kind of "model imaginative reader," to rework Umberto Eco's definition (1984, 9).

Finally, and in only apparent opposition to the first point, I would argue that mental imagery can acquire particular importance when it cannot be called forth. The importance of an unimaginable object is automatically maximised, and tends to produce a series of lateral depictions, or of proxy objects, usually but not necessarily based on metaphors or analogies, which can but approximate the object's nature. In these cases, the imaginative attempt goes hand in hand with an effort at comprehension, and leads to clarify as much as possible the borders of the unexplainable, searching with increasing precision exactly where and how it begins to affect the world in a perceivable way, and what its exact ontological positioning can be.

This can be a way of portraying ultimately undefinable psychological entities, but it was also the only way of approaching atomic and quantum phenomena. Atoms, for example, could not be observed *per se*, but only in the traces left by their paths. Their nature presented the problem of an irreconcilable duality, which showed contradictory characters depending on the experimental setting, and led to Bohr's preoccupations with language. Thus, as Gaston Bachelard explained, in microphysics "it is impossible to imagine a thing without positing *some action* of that thing" ([1934] 1984, 63). To Schrödinger, the only possible way of maintaining a scientific model of the universe in the aftermath of quantum mechanics was to "eliminate the regions which refuse to be filled with thought; in other words, to form a view of the world which does not contain those regions at all" (1935, 131-32). When it came to explain those things to the laypeople, however, some kind of alternative visualisation was indispensable, and oftentimes connected to the author's own metaphysical taste.¹⁹

If the empirical basis of fictional imagination and some elements of its fundamental utility are established, it is more difficult to find a way of channelling these elements into a semantics-oriented theory that would allow to show how fictional texts can imaginatively address ontological and epistemological questions, and produce world-visions that are partially akin to, and resonant with, contemporary scientific theories. Fortunately, however, literary studies can provide another

¹⁹ I will always keep this in consideration, but particularly clear samples are given in ch. 3.3, 270 ff.

methodology that, similarly to Scarry's work, focuses on the production of imaginary artifacts sparked by fiction, and that can prove to be a profitable framework for a comparison with science: fictional worlds theory.

Fictional Worlds Theory and the Experimental Side of Literature

The idea that a fictional text projects a world in which readers transfer themselves is quite intuitive to everyone who ever experienced fictional immersion. Fictional worlds theory draws on this intuition to build a framework for literary, semantic, and narratological analysis. The methodology is loosely derived from the branch of modal logic studying possible worlds, which includes philosophers such as Saul Kripke, Jaakko Hintikka, Alvin Plantinga, and David Lewis, and has developed since the 1960s. Possible worlds are very distant relatives of the idea developed by Leibniz in his 1710 *Theodicea*, and are generally taken to describe “sets of alternative states of affairs” (See Fořt 2016, 13-14). They are used, among various things, for the evaluation of modal operators for possibility, necessity, and impossibility in logical semantics, thus allowing, for example, the analysis of propositional attitudes such as belief, desire, etc., and of counterfactual statements. As infinite sets of alternatives surrounding our actual world, posited at various distances from it, possible worlds allow to determine truth-values for propositions that, by being quantified in terms of worlds, can account for what is in-between plain truth and falsity. The distance between worlds is determined by their relative difference, expressed in terms of stronger or weaker accessibility relations.²⁰

²⁰ A sentence will thus be, for example, necessarily true if it is so in all possible worlds, and possible at various degrees if it is true in at least one possible world accessible from the actual world. One of the main models for such evaluation was developed by Kripke. Michael Loux, often quoted by Marie-Laure Ryan (e.g. 1991, 16-17; and Ryan and Bell 2019, 4) provides a clear summary of it: “Kripke defines what he calls an *M*-model structure, telling us that ‘this is an ordered triple (G, K, R) ,’ where K is a set of objects, G is one of the objects belonging to K , and R is a relation defined over the members of K . Intuitively, Kripke tells us, we are to think of K as a set of all possible worlds; G is to be thought of as the actual world; and R represents a relation which Kripke calls *relative possibility* and others have called *accessibility*. Intuitively, we are to understand this relation in such a way that a world, W , is possible relative to or

Relevant proponents of a fictional interpretation of possible worlds, with their main works on the topic, are Umberto Eco (1984), Thomas Pavel (1986), Marie-Laure Ryan (1991), Ruth Ronen (1994), and Lubomír Doležel (1998). To these, I would add Elena Semino (1998) with her adaptation of possible worlds theory to poetry, and Thomas Martin (2004) with a theoretical approach of possible worlds to poiesis and metaphor, and a defence of the method. While possible worlds are logical constructs that can be taken as abstract sets, fictional worlds are considered as much more substantial, to the point that the relation between the two is sometimes taken more as a metaphor (Ronen [1994, esp. 51 ff.] emphasises the differences over the similarities). The comparison between the two concepts can help highlight the peculiarities of fictional worlds. Our main point of interest is that fictional worlds are considered as products of imagination, not of logic. Bohumil Fořt has shown that possible worlds of logic are, in Saul Kripke's words, "*stipulated* not *discovered* by powerful telescopes" (qtd. in Fořt 2006, 189). In practice, thus, they function more like abstract systems for propositional evaluation than states of affairs *stricto sensu*, whereas "it is fictional worlds that provide us with universes that we can 'view,' speak about, and imagine" (193).

The main difference is, thus, ontological: whereas possible worlds are ontologically neutral within the realm of logic, in Doležel's words, "[o]utside formal logic . . . the model cannot preserve ontological innocence" (1998, 13).²¹ In particular, there is a certain agreement that, following Nicholas Rescher's definition of possibility (1973; 1999), fictional worlds can be considered as *entes rationis*, or mental (cultural and aesthetic) artifacts representing universes, which depend on human

accessible to a world, W' , just in case every situation that obtains in W is possible in W' . Now, we are to suppose that R is defined over K in advance; that is, we are to suppose that it is antecedently fixed just which worlds are possible relative to which. To get an M -model structure, the specification is subject to just one restriction: the relation of accessibility has to be reflexive; it has to be the case that every world is accessible to or possible relatively to itself" (1979, 21).

²¹ In philosophy, for example, possibilist positions vary between what Marie-Laure Ryan and Alice Bell, following Robert Adams, call "soft actualism," which assigns a special role to the actual world as a standpoint that is instantiated, while possible worlds are not (2019, 6), and more extreme positions such as David Lewis' *modal realism*, postulating no ontological difference between possible worlds and actual world (see e.g. Pavel 1986, 49; Doležel 1998, 13; Ryan and Bell 2019, 6).

thought and imagination for their existence (see for ex. Ryan 1991, 18-23). This ontological specification allows fictional entities to be classified as “nonactualized possibles,” solving the philosophical problem of what we are referring to when we are talking about, for example, a character in a play: “While Hamlet is not a man to be found in the actual world, he is an individualized possible person inhabiting an alternative world, the fictional world of Shakespeare's play. The name *Hamlet* is neither empty nor self-referential; it refers to an individual of a fictional world” (Dolezel 1998, 16). As an extra condition, moreover, Marie-Laure Ryan has adapted David Lewis’ modal realism, which sustains an ontological equality between actual and possible worlds (see n. 21), to better represent the role of immersion in reading. Defined as “recentering” or “relocation” the effect of immersion is to relocate the reader within the fictional world, which is thus considered, for the time of the suspension of disbelief, as the new actual world. Therefore, “recentering pushes the reader into a new system of actuality and possibility. As a traveler to this system, the reader of fiction discovers not only a new actual world, but a variety of APWs [alternative possible worlds] revolving around it” (1991, 22). The process includes decoding spatial and temporal orientation, and interpreting deictic clues.²² Importantly, it also means that a fictional world can be “looked at” both from the inside (as something in which we reside for a time) and from the outside, in relation to the actual world or to other possible worlds. In this last sense, accessibility relations between the actual and any fictional world can be formulated based on various criteria, according to the readers’ interest.²³

Another fundamental difference with possible worlds is that, while the latter are stipulated depending on the conceptual stimulus and the occasion, fictional worlds depend on the text: they are indeed “discovered” by the readers with every new page (in the case of written literary fiction, though

²² See also Herman (2009, 113-27) on various theories, including Lewis’, related to the topic of the deictic shift that occurs when we relocate in a story. On immersion and its experiential and emotive effects, see Schaeffer (2010), in particular pages 153-73 which include a counterargument to Walton’s make-believe theory.

²³ Marie-Laure Ryan (1991, 31-39), for example, lists various categories for classifying accessibility relations, including identity of properties, identity of inventory, compatibility of inventory, chronological, physical, taxonomic, analytical, logical, and linguistic compatibility; their variations can be useful to distinguish between different (non-)fictional genres.

fictional worlds can in principle derive from texts in any medium). To recall Umberto Eco, while possible worlds of logic are taken as bare sets, fictional worlds come to the readers already “*overfurnished*” (1984, 218). Their objects, entities, and states of affairs are what matters: as readers, we are interested in how that world functions, and what goes on inside it. In line with Elaine Scarry, a text thus becomes a “set of instructions” (Doležel 1998, 21) to construct fictional worlds.²⁴ Taking the discursive voice into account, texts can be considered as performative speech acts which have the effect of making the possible actual in fiction: “If uttered felicitously, the literary performative changes a possible entity into a fictional fact. In other words, fictional fact is a possible entity authenticated by a felicitous literary speech act” (146). This means that the nature of the speaker (e.g., the narrator in the narrative case) is fundamentally implicated in the ontological confirmation (or rejection) of the world.²⁵ In addition, according to Marie-Laure Ryan’s “principle of minimal departure” (1991, 48-60), again inspired by Lewis, textual instructions are integrated with common knowledge about the actual world: unless they are explicitly informed of a difference or have reason to believe otherwise (e.g., because the text has specific genre conventions, or instils ontological doubts), readers would consider a fictional world as functioning like the actual world.²⁶

²⁴ Marie-Laure Ryan specifically distinguishes between a “Textual Reference World” (TRW) and a “Textual Actual World” (TAW): “TAW is offered as the accurate image of a world TRW, which is assumed (really or in make-believe) to exist independently of TAW” (1991, 25). While the two usually collide in fiction, in cases such as that of an unreliable narrator the TAW will not correspond to the TRW.

²⁵ In this sense, limiting the description to narrative fiction, Doležel distinguishes between a *dyadic authentication*, represented by the absolute authority of the omniscient narrator on the one hand, and the voices of the characters on the other; and a *graded authentication*, including all other cases in which the narrator’s status leads to a less certain (or disrupted) authentication of the world (1998, ch. 6). In line with her recentering theory, and considering fiction with the help of make-believe, Marie-Laure Ryan regards the sender/speech actor as pertaining to the same world of the fiction and of the recentred receiver. With regards to fictional texts, her model involves an actual speaker and an actual hearer (author and reader) in the actual world, the former pretending to be a speaker speech-acting in the fictional world to an audience, the latter accepting such dynamics and usually, but not always (think, e.g., of an epistolary novel), considering himself or herself as part of the audience (1991, 61-76).

²⁶ In Umberto Eco’s words, “[a] fictional text abundantly overlaps the world of the reader’s encyclopedia” (1984, 221). Pavel (1986, 102) talks about the “porosity to actual world information” that a text has in variable quantity. Importantly, the encyclopaedia of a certain culture is historically variable, which changes both what a text’s “model

Being mental constructs taken, in Ronen's words, as "concrete *worlds*" (1994, 46), the entire structure of fictional worlds is sustained by, and profits from, the readers' imagination. Therefore, although fictional worlds theory is first and foremost a methodology for textual interpretation, imagination and the related questions posed by *what if* scenarios, mental simulation, and sense-reference relations sustain the entire analysis. Doležel is quite explicit: "Having reconstructed the fictional world as a mental image, the reader can ponder it and make it a part of his experience, just as he experientially appropriates the actual world" (1998, 21). Marie-Laure Ryan, too, oftentimes used the term "world-image" in her first work (Ryan 1991, e.g. 26), and later on linked fictional worlds theory to more cognitive approaches (David Herman's in particular) through the notion of *storyworld*. She underlined that "the association between storyworld/cognitive approach and fictional world/ontological approach should not be taken in an exclusive sense, for storyworlds can raise ontological issues, and the recognition and evaluation of fictional worlds involve cognitive operations" (2016, 12). The main difference between the two concepts, as she later explained (2019, 62 ff.), is that a storyworld can also be an image of the actual world produced by a text, and that it must ensure narrativity. Otherwise, the two can in large part be considered as one theoretical entity (and I will often use the terms interchangeably in my work):

One can imagine a purely descriptive fictional world lacking a temporal dimension, but this world would not be a storyworld. The relation between storyworlds and fictional worlds is thus one of overlap: some storyworlds are not fictional, some fictional worlds are not storyworlds, but most imaginary worlds are both.

(63)²⁷

reader" is expected to know and what kind of entities in a fictional world are considered as possible in the actual world: "The actual world as well as the relation of accessibility are different for the authors of medieval miracle plays compared to the author of a modern mystery novel" (Pavel 1986, 47).

²⁷ Ryan continues by saying that, as mental constructs, both storyworlds and fictional worlds can be considered as having only "loose relations" with their texts, and proposes three possible special cases: a narrative can produce several worlds, for example by presenting opposite outcomes for the same situation as ontologically equal; a single world can have many unconnected stories; and the same world can be represented by many different texts (2019, 64). The third case, in its various versions, has been especially studied by Doležel (1998, 199-226).

The question of experience and imagination is also linked to the last differences between possible and fictional worlds that I will address. First, possible worlds are taken to be maximally complete, which means that every proposition about them must be either true or false; fictional worlds, on the other hand, are by necessity incomplete: “It would take a text of infinite length to construct a complete fictional world” (Doležel 1998, 169, see also 15-16). Arguably, however, the same can be said for the actual world from a human perspective, even more so when quantum physics comes to the fore of the issue.²⁸ Moreover, the lack of clear answers regarding unspecified particulars does not necessarily impair the reader’s experience of the world as complete, but can be treated, within the suspension of disbelief, simply as missing information (Marie-Laure Ryan 2019, 75). Secondly, and on a similar note, possible worlds and fictional worlds process the notions of possibility and impossibility differently. As well summarised by Ronen (1994, 48-57), possible worlds, as constructs to evaluate the actual world, are taken to be the latter’s alternative yet non-actualised versions. Instead, fictional worlds are in principle completely autonomous, and can be of whatever kind and nature: “The thing about fictional events is that they do not take place in the world (and are not necessarily possible relative to the world), but they may take place in the world of fiction” (51).

This means that fiction may include events that can be physically, or even logically, impossible, as well as completely different sets of possibilities orbiting around the actualised fictional world. To use Doležel’s categories (1998, 31-33), a fictional world possess at least its own “states” of absolute and eternal logic, to which can be added its own natural laws and natural and material world in general, termed “N-force,” and its own (one or more) people (not necessarily human). It also possesses certain specific alethic, axiological, deontic, and epistemic modal systems, generating specific constraints (113-28). To add Marie-Laure Ryan’s constructs, its sentient beings will, in their

²⁸ And Nicholas Rescher (1999) has given a similar objection for the pragmatic use of possible worlds’ completeness.

turn, produce their own alternative worlds made of their beliefs, obligations, wishes, and fantasies, at times in conflict with each other or with their actual world (1991, 113-19).

All these elements contribute to define worlds that are generally consistent: one way or another, they *make sense*. I would argue, preliminarily, that there can be some sense even in the nonsense, and I will come back to this in my analysis of quantum physics and literature. For now, I want to emphasise with David Herman that “[s]toryworlds [and fictional worlds] are global mental representations enabling interpreters to frame inferences about the situations, characters, and occurrences either explicitly mentioned in or implied by a narrative text or discourse” (2009, 106).²⁹ The inferential character of fictional worlds and storyworlds is valid at every level: in Eco’s terms, readers have to take “inferential walks” (1984, 31-33), recalling their knowledge and beliefs, at every junction of a narrative, creating a continuously evolving system of expectations that fuels the narration.³⁰

Fictional worlds are thus artifacts to produce inferences, they keep asking to be reflected on while and after reading, they hint at what might come next and at what might generally be behind their very structure. In the words of Thomas Pavel, “explanatory models being constantly judged, fictions must struggle in order to have their truth recognized and accepted. Therefore fiction feels free to explore hypotheses, to construct models deliberately offered for public appreciation” (1986, 132). Again Pavel (95), moreover, has noted that inference is usually controlled by the text, so that readers are not led to ponder about everything, just about what is or seems related to the story. Fictional worlds, thus, are constructed to point us towards certain hermeneutic directions. The process of making sense of a mentally devised world is a crucial point and it is also what leads, inevitably, to connect fictional worlds to the actual. Even when fiction tries to detach itself from reality, once we are back to the actual world, we cannot escape the comparison: the fictional world is now part of our

²⁹ When it comes to suspension of disbelief, after all, fictional information is processed as if it were real (Pavel 1986, 89; Schaeffer 2010, 87-88).

³⁰ As Eco notes, “this dialectic of forecasts and proofs . . . is in fact unpredictably distributed all along the interpretative journey, but it definitely concerns the world structure of the text, that is, the deep extensional level, and only at that level can it be rigorously analyzed” (1984, 32).

past experience. This is even more valuable in artworks, such as those of modernism, which look at reality as a goal to be discovered by taking fictional detours.

What I have said should make clear that storyworlds and fictional worlds generally start from a series of initial conditions involving referents that are taken to be actual, and result in a controlled mental simulation of how those conditions play out. Moreover, they invite their audience to predict, reflect on, and in some way understand them, and eventually can be examined in comparison to the real world. I would argue that all these aspects point towards a connection between fiction and possibly the most imaginative side of science: thought experiments. A thought experiment (or *Gedankenexperiment* in Ernst Mach's terminology)³¹ is an experiment conducted in imagination, usually described in text, and produced in order to raise or respond to questions rationally (Sorensen 1992, and esp. 205). It can be used both in philosophy and in science, for teaching, explaining, or analysing theories. Most importantly, and most mysteriously, however, thought experiments are considered means of discovery, which have been profitably used in physics since at least Galileo, and particularly, as we will see, in early 20th century, by Einstein, Heisenberg and Bohr among others.

Thought experiments spare with the need of setting up an equipment, allow to consider apparatuses that could not be obtained in reality (in that moment, or even ever), and can also be used to envision paradoxical situations, in order to work out a solution *ab absurdo*. Most of the times, they do not require quantitative data. And many times, they also ask those involved to reposition themselves in imaginative surroundings (such as Einstein's famous train and platform), and to take up certain perspectives. As ways to play out the result of a new paradigm, thought experiments are also, in the opinion of Thomas Kuhn, "one of the essential analytic tools which are deployed during [scientific] crisis and which then help to promote basic conceptual reform" (1977, 263), which is why they are frequent in the work of the protagonists of philosophical and scientific revolutions (264).

³¹ Although Mach is usually credited with inventing the word "thought experiment" in his 1883 *Die Mechanik in ihrer Entwicklung: Historisch-Kritisch Dargestellt* ("The Science of Mechanics; a Critical and Historical Account of Its Development"), the term had actually been used in various cases before: see Brown and Fehige (2023) for an overview.

The idea that fiction is a thought experiment is not necessarily new,³² especially when it comes to modern literature. In studying Italian authors, including Gadda, and science, Pierpaolo Antonello emphasises that “[l]a letteratura allestisce micro-scenari osservativi, ‘verifiche sperimentali,’ inventa *gedankenexperimente*, lavora induttivamente e deduttivamente, mettendo alla prova circostanze, situazioni, limiti etici, conoscitivi e pragmatici dell’umano” (2005, 7).³³ Allen Thiher frequently uses the concept to describe the works by Musil (2005, 92), Kafka (145 ff.), Joyce, along with Woolf, Faulkner and Borges; he proposes that “since Joyce and Kafka, the notion of experiment is accurate to describe the way some fiction tests science” (214), specifying that:

By experimental fiction, I mean literary works that embody thought experiments. If both fiction writers and scientists can be said to undertake thought experiments, it is because the following proposition can be applied to both scientists and writers: a thought experiment is an experiment worked out in the imagination, usually by supposing the truth of a given model or theory and then imagining the consequences of the application of that model or theory. (214-15)

Catherine Elgin similarly highlights the two-way connection between fiction and thought experiments. She considers the latter as involving narrative structure, suspension of disbelief, and an oftentimes not univocal interpretation (2014, 230-31); the former allowing for the selection and isolation of particulars and states of affairs (232) and enabling readers “to treat . . . information as evidence” (238), thus providing a cognitive upshot.

³² One of the first such literary investigations, quite large in scope, is by Walter Moser (1989). At other times, the idea is presented for specific works, like Doležel does for Defoe’s 1719 *Robinson Crusoe* (1998, 37); or comes to include entire genres, like Isabelle Stengers’ analysis of science fiction as thought experiment “experimenting with the metamorphic effect of an operation of dishabituation, that is, of the destabilization of the settled, authoritative distribution between the possible and the impossible, the acceptable and the unacceptable” (2018, 32).

³³ “Literature sets up observational micro-scenarios, ‘experimental verifications,’ invents *gedankenexperimente*, works inductively and deductively, putting to the test circumstances, situations, ethical, epistemological, and pragmatical limits of the human.”

Laterally, it should be noted that Thiher's and Elgin's works reflect a recent interest in philosophy of science, where the question of the cognitive role of imagination is oftentimes linked to the value of thought experiments. While some deny any role to the imagination³⁴ and others reach for the Hyperuranion to propose the intervention of Platonic ideas,³⁵ there are also those, like Tamar Gendler, who take the middle road and consider that in thought experiments "the presence of a mental image may play a crucial cognitive role" in forming new beliefs (2004, 1154). Nancy Nersessian, too, takes thought experiment as a "mental model" which is "non propositional in form" (1992, 293) – though it does not necessarily require a mind's eye picture (it can be an analogical model too). More recently, she has stressed the probable role of motor representations and kinaesthesia in the simulative process (2017, esp. 317-19); this provides a parallel to Starr's work on aesthetic feeling. Although Nersessian is uncomfortable with regarding thought experiments as fiction, many others, along with Thiher and Elgin, have proposed such a view.³⁶

Some of these comparisons can prove useful for my analysis. Geordie McComb, for example, has provided a five-point analogical model based on Wittgenstein-inspired "family resemblances" to define thought experiments as a multidisciplinary category. In his view, a proper thought experiment should include at least four out of five fundamental characteristics.³⁷ On such an account, having a

³⁴ The most extreme case being John Norton, for whom thought experiments are simply arguments positing counterfactual situations and adding ultimately irrelevant imaginative particulars (e.g. 1996).

³⁵ It's the case of James Robert Brown (1991).

³⁶ These includes accounts based on Walton's theory of make-believe, such as those of Letitia Meynell (2014); and Fiora Salis and Roman Frigg (2020). Talking about the application of Walton's theory to scientific models, Amie Thomasson has noted that "Walton, however, takes all discourse apparently involving reference to fictional characters to be best understood as (at least implicitly) in the context of a game of make-believe" (2020, 58), which leads to problems in discussions about mental models, requiring serious ontological commitment. As an alternative, she proposes an artifactualist approach which considers fictional entities as abstract artifacts. Thomasson's argument could be extended to fictional accounts of thought experiments and, if I am allowed an outsider perspective, it seems that a storyworlds theory would provide a good implementation for an artifactualism of thought experiments.

³⁷ That is, they should involve 1) a hypothetical element (such as a state or scenario); 2) an imaginable in a sensory modality; 3) a personal mental activity; 4) a well-defined cognitive upshot; 5) no new empirical data for its justification (2013, 209-10).

specific cognitive upshot is a contributing factor, but not a necessary one, and a complex literary fiction such as William Styron's 1979 *Sophie's Choice* passes the test as thought experiment (2013, 218). Alice Murphy makes a similar claim when she writes that the interpretation of a thought experiment can be contested like that of an artwork, giving the example of the Einstein-Podolsky-Rosen paper (2020a, 158-59; but see here ch. 3.4, 307 ff.). Importantly, she also precises that thought experiments, being performative, fundamentally blur the distinction between discovery and justification (156).

All these elements point to the fact that, in taking a thought-experiment view of fiction, fictional worlds theory can help turn an intuition or a comparison into a strong interpretative framework. The focus on fictional referents and on their imaginative playing out, the principle of minimal departure, the inferential processes extended to world-structures, and the accessibility relations drawn with the actual world are all points in favour. Fictional worlds provide a mental-laboratorial setting based on immersion, and also allow for its analysis "from the outside" in the actual world. At the same time, focusing on the thought-experiment dimension of fictional worlds leads to emphasise a certain kind of interpretation over other possible uses of the theory: one that ultimately aims at a world, what or how we can know about it, and what this says about our own. Scientific frameworks, in this sense, would provide the perfect blueprint for interpretation (though one that, as I have noted, asks to be refashioned and transformed once it enters literary discourse).

When it comes to literary thought experiments, there are also a few differences. First, the focus will not only be on natural phenomena, but on all that concerns human affairs, and in particular the human mind. Secondly, as a consequence to this, the cognitive upshot will be less clearly definable, and the role of the reader/interpreter will be pivotal. This does not mean, however, that all inferences can be deemed correct, or that, even though not necessarily definitive, some inferences cannot be taken as justified. Thirdly, intertextuality will play a stronger interpretative role than in scientific

thought experiments.³⁸ Finally, the focus on reference has to be mediated by sense. Doležel refashions the two concepts in terms of intension and extension. The latter is, as is generally taken, what an expression refers to (1998, 136), yet the former is directly linked to texture, i.e., the exact words used in the text (137). As Doležel remarks, “[i]n its semantics, literature (poetry) aims in the direction opposite to science: it is a communicative system for activating and putting to maximal use the resources of intensionality in language” (138). Intension can be studied by analysing the very form of a text (at all levels, from phonetics to macrostructure), and is to be taken as a semantic device generating “‘emergent’ meaning by a totalizing projection of linear constituents” (138).

When considering the role of imagination in both thought experiments and fiction, it should be remembered that, even though propositional imagination can play a large (to some the only) part in the simulation, imagistic imagination provides with the advantages already mentioned. In particular, thought-experimental fiction can help deploying and “running in simulation” certain objects or states of affairs that, in their vividness, invite inferential (in this case inductive) exploration. Such objects, which at times can be tentative imaginations of the unimaginable, may thus hold the structure of their world within themselves. This is a strong connection between physics and literature: in the words of the physicist Giovanni Vignale, describing the ways in which physics resembles fiction, “in physics there is only a small set of charismatic concepts, which are deemed sufficiently strong to serve as building blocks for theories of the real world” including “particles, fields, rays, vortexes, and now strings” (2021, 143). These things, I would say, acquire their importance not in their quiddity, but in

³⁸ Though, arguably, intertextual relations play a part in science too. Think of Galileo’s thought experiment inside a moving ship with constant velocity with no access to the outside, and Einstein’s thought experiment of a scientist in a closed chest pulled in space with constant acceleration (see ch. 2.1, 133 n. 4). Galileo wanted to make his readers understand that there is no absolute difference between rest and uniform motion, whereas Einstein that there is no difference between constant acceleration and gravity. In setting his experiment in conditions inspired by Galileo, however, Einstein clearly connected the two experiments, and made the readers cognisant that his work had to be considered in light of that of his predecessor.

their interconnection to the rest: the systems that they generate, though explored from the surface, hint at deeper structures.³⁹

It should be clear, by now, in which ways Einstein's idea of visualising a theory can be paralleled to the reading of a novel. My methodology, to recapitulate, will be pointed towards a comparative close reading of literary fiction, in order to explore the relations between physical theories and fictional works, and draw the most from both isomorphic features and direct connections, through the methods of literature and science. The research will be focused on how Valéry, Woolf, and Gadda could lead their readers to imagine the world and its epistemic conditions, along with the beings in it in their mutual interconnections. Contemporary science will provide frameworks for such interpretations, while fictional worlds theory, taken with an emphasis on the thought-experimental character that it postulates for fiction, will serve as general approach to highlight how fictions produce general inferences that can lead to ontological and epistemological conclusions. My expectation is that a science-inspired framework may provide novel and insightful readings of these authors' works, all of which were experimental and/or unconventional for their time, and thus show a new side of their commitment to the exploration of reality. This framework will also help defining the epistemic role of literary imagination and its possible hermeneutic uses, while presenting specific cases of how science is transformed and reshaped by literature. Before I begin, I will summarise my work's structure.

Overview of the chapters

My work is divided into three main sections, along with this introduction and a conclusion.

³⁹ Vignale would refer to this as physics' "holographic principle," according to which "the surface becomes the whole world, but this world owes its characteristic properties to an underlying bulk, which remains unobserved and unseen" (2021, 141). Indeed, fiction extends the realm of the observable (for example to the inner thoughts of the characters) but can in turn refer to even deeper structures.

Section 1, entitled “Mind and Matter,” will be dedicated to presenting the literary authors, Valéry, Woolf, and Gadda, with a particular emphasis on their ideas regarding the relations and interconnections between mind and matter, as they are expressed in non-fictional and fictional works. My analysis will hinge upon various metaphors and analogies taken from contemporary science, leading to the possibility of modelling mental phenomena through physical frames. Special attention will be given to those discoveries and theorisations that, since the turn of the 19th century, led to the success of the atomic model of matter and to a related weakening of the duality between matter and energy. I will argue that such frameworks were customised by the studied authors and remained productive throughout their career. In fact, these concepts will work as a basis to integrate further ideas throughout my research. This section is thus fundamentally preparatory, the most general in scope, and therefore the less reliant on fictional worlds theory and close reading. After an expository introduction in chapter 1.1, chapter 1.2 will be dedicated to Valéry’s early theories of mind and their evolution, with a focus on the analogical role of thermodynamics and atomic theories. Chapter 1.3 will discuss the metaphorical and analogical role played by atoms in Woolf’s ideas of literature and human perception, and show what results from these ideas in some of her short stories written throughout various years. It will also serve to link atomic theories to descriptions of human erotic relations, as a way of defining the nature of human beings. Chapter 1.4 will be dedicated to explaining the main tenets of Gadda’s physics-inspired systemics, as well as the role of physics in his interpretation of Freudian *libido* as one of the main actors behind historical events. In this latter sense, the analysis will focus particularly on the non-fictional 1944-45 *Eros e Priapo* (“*Eros and Priapo*”), the text most apt to show this physical-Freudian model, which will be pivotal for the subsequent interpretations.

Under the title “Literature and Relativity,” section 2 is centred on relativity theory from a variety of points of view, but particularly as a theory of the continuum. In chapter 2.1, I will briefly introduce the topic and the role of imagination for Einstein; chapter 2.2 will be an analysis of Valéry’s 1921 *Eupalinos ou l’Architecte* (“*Eupalinos or the Architect*”), underlining the importance of perspective,

body-mind-world symmetry, and proprioception in artistic creation and world-definition through Valéry's personal interpretation of general relativity. It will also introduce the concept of spacetime image as object or situation that allows to derive a world-structure from its own formal properties. Chapter 2.3 will investigate Woolf's *To the Lighthouse* (1927) through a framework tailored from Minkowski's spacetime representation as it was filtered by English philosophy. I will use it to study the novel's concerns with spacetime and its role in meaning-making, memory, and the relations between life and death. Here, too, symmetry and continuity between mind, body, and world will play a pivotal role, and artistic creation will be taken as a spacetime image revealing such interconnections, both in the structure of the novel and in the fictional example of the painting by the character Lily Briscoe. In chapter 2.4, finally, I will examine Gadda's 1943 *L'Adalgisa* ("The Adalgisa"), a collection of short stories derived in part from other unfinished novels from the thirties; the analysis will be developed especially from the point of view of general relativity, to show Gadda's satirical view on Milan's bourgeois society. Centred around the attack to the illusion of absolute perspective, Gadda's work portrays such illusion's comical results (shown by spacetime images) on the one hand, while searching for invariant conditions for all living beings on the other.

Section 3 is entitled "Literature and Quantum Physics." Here, I profit from a scientific framework opposite to that of section 2, focusing on epistemological and ontological discontinuity, and the end of the possibility of a coherent and complete knowledge of the world. Given the complexity of the topic in scientific and philosophical terms, chapter 3.1 will present a general exposition of the theories and their discussion until the 1930s, including the role of thought experiments in them. Chapter 3.2 will consider Valéry's 1941-45 play *Mon Faust* ("My Faust") with particular attention to the concept of wave function. This will be linked to the role of possibility both in aesthetics and in human experience. I will also discuss the problem of the imaginative crisis brought about by the new science and the feasible indirect literary ways of visualising non-enacted possibility and incapsulating fundamental breaks in ontological structures. I will call these quantum images, and use the concept throughout the section. Chapter 3.3 will look at Woolf's *Between the Acts* (1938-41)

from the point of view of quantum complementarity, building on a parallel with Woolf's ideas related to a similar complementarity of fact and fiction as idealisations which is thematised in the novel. I will show the role that such complementarity plays in shaping human actions and history, and the possibilities inherent in the interruption/disruption of one or the other idealisation. Chapter 3.4 is dedicated to the analysis of Gadda's *Quer pasticciaccio brutto de via Merulana* ("That Awful Mess on the Via Merulana"; 1957. See here 8 n. 7) through quantum indeterminacy. The chapter will underline the ontological role of chance in Gadda's storyworld, the epistemic disruption that it inevitably brings about, and the ethical consequences of such a world-image.

I conclude this thesis by recapitulating the results of the research, coming back to the presence of opposite frameworks of continuity and discontinuity (which parallels the physical methodology) in modernist literary texts. Moreover, I argue for the key role of ontological incompleteness in quantum novels, and consider in more depth the complexity of the transformations of scientific concepts when they move to the literary discourse.

SECTION 1

MIND AND MATTER

Atomism and Energy in Connection to the Mind

This section will serve a double purpose. On the one hand, it will introduce the literary authors, Valéry, Woolf, and Gadda, giving particular emphasis on the character of their involvement with late 19th century and early 20th century physics. On the other hand, and starting from such engagement, it will explore these authors' preoccupations with the Cartesian issue of mind and matter, the *res cogitans* and the *res extensa*, in their mutual involvement, in both their theoretical and their literary writings. While the analysis will highlight a series of commonalities, it shall also portray the peculiar kinds of intersections that each of the authors entertained with the scientific discourse. In this sense, it will prove fundamental to show the distinct and personal ways in which their epistemological and ontological theorisations were infused in their literature.

Between the end of the 19th and the beginning of the 20th century, physics was confronted with a series of discoveries that led to a new framework for defining materiality.¹ At the beginning of the 1890s, atomistic views were decreasing in popularity, and the actual existence of atoms could still be denied, or at least considered a useless or counterproductive assumption, by such figures as Wilhelm Ostwald, Pierre Duhem, and Ernst Mach.² In the next 20 years, however, not only did atoms become a fact, but their nature was revealed to be completely different from what had been imagined up to

¹ For the history of physics in this period (including atomic theories, Brownian motion, and the first quantum theories) see, among others, Peter Clark (1976); Crease and Mann (1996, 12-33); Pesic (2002, 85-99); Müller (2007, esp. 273-81); and Chalmers (2019).

² On the three and their opposition to Ludwig Boltzmann's atomistic positions, see e.g. Zahar (2003); more generally, see Peter Clark (1976, esp. 88-93).

then: they were deeply entangled with the concept of energy and left matter quite less solid than before. The discovery of X-rays by Wilhelm Conrad Röntgen at the end of 1895, and its diffusion since the first days of the next year, showed a kind of radiation that could pass through some types of matter, providing a way to dissolve the substantiality of the flesh and show the bare bones within it on a photographic plate.³ A few months later, experimenting with the new finding, Henri Becquerel found, in a quite fortuitous way, that rocks containing uranium released X-rays spontaneously, along with other frequencies of radiation, thus apparently producing energy from their own matter: it was the first detection of radioactivity. In 1897, experimenting with cathode-ray tubes in which vacuum was created, J. J. Thomson in Cambridge proved that electricity is composed of negatively charged corpuscles (later named electrons) whose mass-to-charge ratio was much smaller than hydrogen. He concluded that they were “matter in a new state . . . this matter being the substance from which all the chemical elements are built up” (1897, 312).⁴ In the same laboratory, and then in Montreal from the following year, Ernest Rutherford found that radiation from radioactive decay came in various kinds: alpha rays were recognised as positively charged helium atoms, while beta rays as fast electrons. By 1900, a third type of radiation, soon called gamma rays, was detected by Paul Villard and identified as highly penetrating electromagnetic waves. In the meantime, at the end of 1898, the Curies had discovered radium.

Rutherford kept experimenting with alpha rays (moving to Manchester in 1907, where he was helped by Ernest Marsden and Hans Wilhelm Geiger) by shooting them against a gold foil and noting how they usually passed through undisturbed yet, more or less once in 8000 times, bounced back. He concluded that, contrary to Thomson’s initial hypothesis, atoms were not spheres of positive charge with electrons stuck inside (the so-called plum pudding model; see Thomson 1904), but possessed a

³ The first radiography was of the hand of Röntgen’s wife, and was published in the article relating the discovery: see Röntgen (1896).

⁴ The charge, thus also the mass, of the electrons (as the particles were soon rebaptised) will be precisely calculated by Robert Millikan by 1910.

heavy positive nucleus surrounded by orbiting electrons, and void space between, in the shape of a solar system that we are now used to imagine.⁵ The new atomic model was first presented in 1911 (see Rutherford 1911), and soon implemented by Bohr through the newly developing quantum theories. Starting from the work of Max Planck in 1900, Einstein had hypothesised in 1905 (in one of the four papers published that year: [1905] 1990b) that light was composed of energy-packets, or light quanta (later called photons), whose energy was always a multiple of a fixed quantity. Bohr understood that electrons were distributed in stable and similarly quantised energy levels, and jumped to a more external level when receiving enough energy (in the form of packet-like electromagnetic radiation, or by collision with other particles), only to give it back almost instantaneously in the same way, coming back to their position. The lines of fixed frequency, characteristic of each element, that were found in the spectroscopical analysis of the electromagnetic radiations produced by atoms derived from such processes (see Bohr 1913).⁶ By 1920, Rutherford could also clearly say that hydrogen nuclei were the basic particles composing all atomic nuclei: he dubbed them protons. The discovery of neutrons only came in 1932 thanks to James Chadwick. Thus, by devoting themselves to the observation of light flashes, electric phenomena, light spectra, and marks on photographic plates, traces left by invisible objects and radiations, physicists were beginning to picture the very components of reality.

In the same years in which Rutherford and Bohr developed their model, the reality of atoms was confirmed by the studies on Brownian motion: the chaotic movement of small particles in emulsions, caused by what was at first only hypothesised to be the disordered collisions with the particles of the medium. Another paper published by Einstein in 1905 ([1905] 1990d) proposed to interpret such motion as a kind of thermal agitation. Similar interpretations were proposed by Marian von Smoluchowski and Paul Langevin. In the following years, Jean Perrin, one of Valéry's close friends, proved the theory experimentally (see Chalmers 2019, sec. 6.1). This confirmed the conception of

⁵ I come back to Thomson's cathode-ray experiment and Rutherford's gold-foil experiment in ch. 1.3, 76 ff.

⁶ For quantum theories, see ch. 3.1.

heat as a stochastic motion of particles, thus substantiating the kinetic theory of gases developed especially by Maxwell and Boltzmann and, with it, the statistical interpretation of thermodynamics. Entropy was declassified from an absolute law to the description of the most probable (indeed almost certain) evolution of a system.

Meanwhile, radioactive decay gave the idea that matter contained (or rather inherently was) enormous quantities of energy, and the news had quite a diffusion among the general public. As reconstructed by Alan Friedman and Carol Donley (1985, 154-71), the idea itself was entertained already before Einstein's famous 1905 equivalence between mass and energy $E = mc^2$ (see [1905] 1990a), and popularised way before Einstein became famous in 1919 (see ch. 2.1 and 2.2): in the UK, the main popular publication was Frederick Soddy's 1909 *The Interpretation of Radium*. Apart from the generally large diffusion of the theory, the book itself was of inspiration to literary writers too, first and foremost H. G. Wells, who took inspiration from it to write his 1914 *The World Set Free* (Friedman and Donley 1985, 165). Soddy's equivalent in France was probably the 1913 popularisation *Les atomes* ("The Atoms") by Perrin. This justifies both Woolf and Valéry's cultural background. Gadda specifically bought good technical accounts that he could consult.⁷ All these theories redescribed atoms as systems in chaotic motion, individual yet complex, creating immaterial force fields that interacted with each other, substantial yet spatially vacuous. The research on their nature involved and influenced the whole of previous physics, from mechanics to optics to thermodynamics to electromagnetism. All the discoveries spelled the equivalence between matter and energy. As Gaston Bachelard summarised:

Instead of . . . simple addition of energy to an unaltered object, modern physics imagines an ontological dialectics of matter and energy. The atom not only atomizes all atomic-scale phenomena but also structures whatever energy it emits. It is subject to discontinuous transformation stemming from discontinuous

⁷ As an example, he possessed the 1925 manual by Leo Graetz and Carlo Rossi, *Le nuove teorie atomiche e la costituzione della materia* ("The New Atomic Theories and the Constitution of Matter"). See Alcini and Giuffrida (2022, 143).

absorption or emission of energy. Hence we cannot simply say that matter is known to us through energy as substance is known to us through phenomena. Not should we say that matter *has* energy, but rather that matter *is* energy and, conversely, energy *is* matter. ([1934] 1984, 67)

Bachelard continued by describing how the new framework allowed to obtain a quantitative description for many phenomena that had been imprecisely qualitative up to then. It is undoubted that quantitative reasoning was to some an advantage – and we will see this in Valéry and Gadda. Yet, as all cases, and Woolf's in particular, will demonstrate, the new discoveries could be as much valuable in qualitative terms to non-scientists, entering in complex and at times playful connections with other theories and world-visions, and being transformed and adapted as a consequence. Apart from such systems that were external to the scientific discourse proper, in this section, atoms, their properties, and their components will be considered in relation to thermodynamics (including the kinetic theory of gases that preceded their experimental confirmation) in Valéry; to atomic physics in Woolf; and to electrodynamics in Gadda. Not only were atoms “a rich source of . . . metaphors for the self” (Whitworth 2001, 147), but the equivalence of matter and energy, their stochastic character, and the contemporaneous affirming and weakening of their material borders could serve as a powerful analogical source to reflect, describe, or picture the relations between material and mental phenomena.

The analysis and modelling of the mind-matter relations inevitably led, in our literary authors, to certain preoccupations over language and expression, as a weakening of the borders of matter and the affirmation of its field-like properties inevitably involves the question of the relations between subject and object. Katherine Hayles has suggested that in new scientific theories, in particular relativity and quantum physics, “[o]ne of the most important . . . implications is that the Cartesian dichotomy between the *res cogitans* and the *res extensa*, the thinking mind and the physical object, is not absolute, but an arbitrary product of the human mind” (1984, 31). This was accompanied by a strong self-consciousness about the way language is supposed to talk about what is “out there,” since

no such thing seems to exist independently anymore. I would argue that this issue, at least in our authors, came up already in the consideration of the atomic nature of matter, and stemmed from a diffused analogy between the energetic character of atomic systems (even before radioactivity, in the case of Valéry) and the internal energy of living beings, be it of a generally mental kind or of a more specifically erotic, or *libido*-like character (see ch. 1.3 and 1.4). As written by Linda Henderson (2007), the theories and discoveries that preceded the scientific revolutions of relativity and post-1927 quantum mechanics should be considered as accurately as the latter in the study of Modernist literature, as they had almost as strong an impact and were widely popularised. As it will be seen, moreover, such theories usually laid the ground for the reception and literary use of the subsequent and even more complex positions in physics.

As anticipated, much of this section will hinge upon the concepts of analogy and metaphor. In so doing, I do not wish to take part in the millennial debate on the nature of metaphor, as this would require, as so often does, a specific study.⁸ The fact that, as I believe, metaphors seem to take different roles and features depending on whether they are used in literary, scientific, or other kinds of discourse does not simplify the matter. More importantly, I am interested in how the literary authors under scrutiny each specifically used metaphors and analogies, and what value they assigned to them, though, in the case in which productive parallels could be drawn between their own use and other theoretical positions, I will not refrain from highlighting them.

Nonetheless, I will consider metaphors as possessing some fundamental traits. First of all, I would agree with Marie-Laure Ryan that “metaphor is not inherently fiction or nonfiction, but shares the fictional status of the surrounding discourse” (1991, 82-83). Secondly, metaphors should be taken as epistemically productive, which makes them a sort of condensed analogical reasoning in the making.⁹ In such reasoning, and this is the third point, the reader is asked (in the literary case at least)

⁸ See at least Hills (2022) for a general summary.

⁹ But not a condensed analogical arguments, at least in the sense given by Paul Bartha, that is the “explicit representation of analogical reasoning that cites accepted similarities between two systems in support of the conclusion

to actively participate. Epistemic productiveness in particular is a trait that seems to be agreed upon by almost all modern and contemporary theories. It is so in semantic accounts such as Max Black's now classical interaction view (1962, 25-47), which sees metaphor as operating an extension of meaning by inviting a dynamic application of a system of commonplaces from a "subsidiary subject" onto a "principal subject." And it is so in linguistic and/or cognitive accounts – from Lakoff and Johnson's conceptual metaphors (1980), describing metaphor as a matter of *thinking* about one thing in terms of another, to Fauconnier and Turner's conceptual blending (2002) which turns metaphors into a sample of a more general cognitive process (see ch. 1.3, 82 ff.). Epistemic gain is also emphasised in accounts pertaining to the framework of possible worlds theory (Hintikka and Sandu [1990]; Martin [2004, 123-52]),¹⁰ seeing metaphors in terms of cross-world semantic connection (so-called "meaning lines") between entities; not to mention studies on the epistemic role of metaphor in science.¹¹ Fourthly and finally, in sustaining the connection between metaphors and analogical reasoning, I will not consider metaphors as isolated phenomena, pertaining to the micro-system of the sentence, but as systemic interconnections which involve various instances along entire texts (and, oftentimes, within the whole authorial macrotext), and possibly including variations in the vehicles that are linked to the same tenor. It is in this protracted recalling and partial deviation, I believe, that

that some further similarity exists" (2010, 1). Even more than the inherent semantic implicitness of metaphors, it is the role of the reader, with his or her own contributions, that prevents us from considering metaphors in this way.

¹⁰ A cognitive value of metaphor has been recognised even in the face of the negation of a specific cognitive *content*, in the well-known account by Donald Davidson, according to which a metaphor directs our attention not to language but "to what language is about" (1978, 37), i.e., the world. On Davidson's idea of metaphors as perspective-taking, see at least also Moran (1989); and Lepore and Stone (2010).

¹¹ Highlighted at least since Boyd ([1979] 1993), who set in stone the distinction between "exegetical or pedagogical" metaphors and "theory-constitutive" metaphors; and Kuhn ([1979] 1993), who argued against some of Boyd's more objectivist assumptions and defended the theory-constitutive character of the solar-system atomic model (538). Contemporary examples are, to name but a few, Burwell (2018), on conceptual metaphors in quantum mechanics, and more generally Camp (2020); Levy (2020); and Kompa (2021). Camp in particular distinguishes metaphors from analogies for the higher freedom in the choice of the features that are matched and the less systematic way in which these matches are enforced, which makes metaphors' "interpretation more imaginatively intuitive and holistic" (2020, 318). In this sense, she defends both analogies' and metaphors' value in scientific discourse, finding the epistemic value of metaphors in their higher need for clarification (324-31).

metaphors manage to involve readers in the epistemic process, while guiding them to a certain extent in the direction that the author intended through the activation of different frames, without necessarily forcing them towards an impossible unanimous interpretation.

*From Entropy to Creation**Paul Valéry, Imagination, Thermodynamics*

Tempest outside, tempest within. A stormy, sleepless night in Genoa, between the 4th and the 5th of October 1892, signs the beginning of Paul Valéry’s new intellectual life. Unrequited love, and a crushing feeling of inadequacy before unreachable artistic models – Poe, Wagner, Rimbaud and, most of all, his master Mallarmé – lead Valéry to a twenty-year-long desertion of literature,¹ and the beginning of a lifelong personal research of the human mind, the *esprit*, and its involvement with reality. Such effort was actualised in several hours dedicated every early morning (usually from 4 am), from 1894 until the end of his life, to jotting down his reflections in his notebooks, the *Cahiers*. Coming back to poetry, after such apprenticeship, in 1912, and after five years of composition, the publication of “La jeune Parque” (“The Young Fate”) in 1917 turned Valéry from a secretary unknown outside artistic circles to one of the most famous poets in France. Although he only wrote poetry actively until 1922, his status was such that he was appointed, among other things, member of the Académie Française in 1925, as well as of the League of Nations in the same year, director of the Centre Universitaire Méditerranéen of Nice in 1933, and professor of “poetics” at the Sorbonne in 1937.²

¹ With few exceptions, such as the 1896 poems “Été” (“Summer”) and “Vue” (“View”) on the review *Centaure* (“*Centaur*”), and the 1897 “Valvins,” as a present to Mallarmé.

² Many of his course notes and integral transcriptions of his classes have been recently published under the supervision of William Marx, Andrei Minzétanu and Céline Surprenant: see Valéry (2023).

Whether we accept the myth of the *nuit de Gênes* (“Genoa night”) as sudden conversion or, like Michel Jarrety (2008, 111-17), consider it a signpost of a much longer and thoughtful process, it is undoubted that Valéry reached an unconventional and highly interdisciplinary worldview, encompassing science and the arts in the same system. His scientific interests focused mainly on mathematics and physics (with the addition of neurology in later years). The former began with the teachings of his friend Pierre Féline since 1889, the latter with the reading of Poe’s *Eureka* in 1891. As Judith Robinson-Valéry summarised (1998, 73-76), his early interests ranged from set theory, topology, study of functions, and non-Euclidean geometries (especially Riemann’s), to classical physics in its most modern expressions (such as the theories of Maxwell, Kelvin, and Faraday). His commitment with physics never faltered, leading him to follow the discipline’s relativistic and quantum revolutions. He developed many contacts and some strong friendships among the main actors in the field, including Jean Perrin, Pierre Langevin, Maurice and Louis De Broglie, Marie Skłodowska-Curie, Albert Einstein, Niels Bohr, and Patrick Blackett (77-78), and could sustain conversations on scientific topics that revealed him, if not a professional, a full-fledged philosopher of science (see Auger 1983).

Although raised to fame by poetry, Valéry was an even more prolific writer of prose, which included somewhat peculiar works of fiction. My analysis will be dedicated to some of the latter, to the particular kind of fictional worlds that they produce, and to their connections to physics. This first chapter will serve as a general introduction. Starting from the existing critical literature, I will draw the focus on the role of imagination in Valéry’s theory of science, art, and literature; its relationship to language and his necessity to rely on scientific technical jargon; the subsequent role of interdisciplinary analogical and metaphorical thought; and how this intertwined with the issue of mind-matter dualism. I will consider mainly those texts that have accompanied him throughout his life: apart from the *Cahiers*, the *Introduction à la méthode de Léonard de Vinci* (“*Introduction to the Method of Leonardo da Vinci*”), an essay first published in 1895, republished with an introductory *Note et digression* (“*Note and Digression*”) in 1919, and again with additional commentary to both

parts in 1931;³ and the fictional cycle of *Monsieur Teste*, started in 1896 with “La Soirée avec Monsieur Teste” (“The Evening with Monsieur Teste”) and then republished several times (1926, 1931, and posthumously in 1946) with increasing additions. This will both serve to single out common practices encountered in the fusion/confusion of science and literary thought, and to highlight some of Valéry’s own peculiarities.

Mental Images in Art and Science

Paul Valéry’s lifetime objective was the analysis of the *esprit*, the human mind, by means of the representation of its internal mechanisms and dynamics. Representation, here, is directly opposed to explanation: “La psychologie ne doit pas être *explicative*, mais seulement représentative” (*C* 3:392; *Pl* 1:786; written in 1903).⁴ Indeed, Valéry refused any metaphysical or final definition: in a neo-positivistic fashion, he conceived knowledge as verifiable (hence perpetually correctible), yet never final (see at least Robinson 1963, 45 ff.; and Pasquino 1979, 28 ff.).⁵ The ideal role of his early “système” (i.e. system) was that of a model, a series of operations defined exactly by a hypercontrolled language. We see, after having barely started, the importance that he assigned to a plastic and formal (if not directly visual) kind of imagination for thought.

This is already apparent in the first work written after the *nuît de Gênes*, the *Introduction à la méthode de Léonard de Vinci*. Far from being a historical reconstruction, the essay points at delineating an ideal Leonardo, incarnation of a thinking system entertained in both artistic and scientific creation. Its main trait is imagination, not as static contemplation of mental objects, but as

³ In the 1919 edition, the title of the new part was *Note et Digressions*, the second word turning to singular in the final version. The 1931 comments were written the year before.

⁴ “Psychology should not *explain*, but simply represent” (*C/N* 5:45).

⁵ As Pasquino also noted, Valéry’s thought can be ascribed to the class of “filosofie della presenza, da Cartesio al neopositivismo” (“philosophies of presence, from Descartes to neo-positivism”; 1979, 28), but opens up to the influx of the non-present in his later years (77-93). I believe that quantum mechanics played a part in this: see ch. 3.2.

conscious following of their sequence. Thinking, for the young Valéry, can be described as “[d]rame, aventures, agitations” (CE 1:871).⁶ Its actors are “images mentales,” not important in themselves, but in “leur succession, leur fréquence, leur périodicité, leur facilité diverse d’association, leur durée enfin” (872),⁷ i.e., in their quantitative relations which, transposed in a physical terminology, delineate a mechanics of consciousness.⁸ Such extremely general character of thought as image variation signs for Valéry the commonality of science and arts: the two “ne diffèrent qu’après les variations d’un fond commun” (871).⁹ Valéry calls this spontaneous succession of concepts and images “self-variance.” As he recorded in 1928:

La self-variance (comme je disais en 95) – la dissolution continue, spontanée des objets de la conscience qui est d’ailleurs l’aspect fonctionnel et l’effet des associations

est le fait fondamental *formel* [margin: Ce changement fondamental n’est pas continu] – car cette substitution perpétuelle fait de toutes choses des éléments identiquement produits, émis et résorbés. C’est un processus d’égalité. Donc les inégalités (le *significatif*) requièrent des propriétés toutes autres et inconstantes, des *potentielles* ou de l’énergie *actuelle*. Il faut pour *inégaliser* ou valeurs excitantes particulières à telle élément, ou action actuelle. (C 12:912; Pl 1:1007)¹⁰

⁶ “Drama, adventure, agitation” (CW 8:10).

⁷ “[M]ental images”; “their succession, frequency, periodicity, varying capacity for association, and finally their duration” (CW 8:11).

⁸ *En passant*, this visual characterisation of thought is quite similar to that described more than fifty years later by Einstein: see ch. 2.1, 132.

⁹ “[D]iffer only in their variations from a common basis” (CW 8:9).

¹⁰ “Self-variance (as I used to say in ’95) – the constant, spontaneous dissolving of the objects of consciousness, which is moreover the functional aspect and effect of associations –

is the fundamental *formal* phenomenon [Added: This fundamental change is not continuous] – for this permanent substitution turns everything into elements produced, emitted and resorbed identically. It’s an *equalizing* process. Thus inequalities (the *significant*) require quite different and erratic properties, *potentials* or *present energy*. To achieve *inequality*, a particular element requires either specific stimulant values, or present action” (C/N 3:156-57 and n. 96).

We can see that consciousness is conceived, by means of analogical reasoning, as an *energetic* system, made from the interaction of *physically discontinuous* elements¹¹ which are all to be considered as substantially equal in order to be studied formally. Meaning-production is obtained by recognising particular elements that stand out from the form, which requires in turn an energy variation (e.g., a superior frequency) obtained either from the outside (through “valeurs excitantes”) or in a conscious internal effort (“action actuelle”). This shows another component of Valéry’s system, the distinction (introduced some years after the *Léonard*) between mutually influencing laws of form and of meaning (“*formel*” and “*significatif*”). As Valéry struggled to recognise the inevitable openness of his system, a third parameter, the accidental (“*accidentel*”) was soon added and with time acquired increasing value.

If conscious thought derives from isolation of elements in motion within the mind, self-consciousness (another basilar issue of his system), as both the study and the actual control of thought-processes, becomes in Leonardo a form of statistical analysis. As Masahiko Kimura noted (2008, 147), the *Léonard* is written under the sign of Laplace’s *Essai philosophique sur les probabilités* (“*Philosophical Essay on Probabilities*”; 1814). If chaos is the mind’s rule, what you need to achieve order is more chaos: “Les événements les plus surprenants et les plus *asymétriques* par rapport au cours des instants voisins rentrent dans un semblant d’ordre par rapport à de plus vastes périodes . . . [l]a connaissance des combinaisons régulières appartient aux sciences diverses, et, lorsqu’il n’a pas pu s’en constituer, au calcul des probabilités” (*CE* 1:888).¹² The result is a form of “*continuité*” (889),¹³ not in the mathematical sense – as Valéry takes pains to specify¹⁴ – but as an

¹¹ This is more important than it looks, and partially explains Valéry’s future interest for quantum mechanics: see ch. 3.2, 249 ff.

¹² “The most surprising events, and the most *asymmetrical* in relation to neighboring moments, return to a semblance of order when considered in relation to longer periods . . . The knowledge of regular combinations is divided among the different sciences; or, where none can be established, it comes under the calculation of probabilities” (*CW* 8:28-29).

¹³ “[C]ontinuity” (*CW* 8:29).

¹⁴ In a note, he precises that “[c]e mot n’est pas au sens des mathématiciens . . . il ne s’agit que de l’intuition naïve, d’objets qui font penser à des lois, des lois qui parlent aux yeux” (*CE* 1:889) (“Here the word is not employed in its

intuitive general law that allows to isolate and describe certain formal patterns. Therefore, in brief, Valéry's ideal mind (incarnated in his Leonardo) is both a chaotic system and the apparatus that observes and influences it.

If formal analysis is self-analysis, it can only be conducted through metalanguage to escape its own clutches. In other words, every process attempting to create some order in the mind *must be* either analogical or presented in a conventionally engineered language: “Le sûr est que toutes les spéculations ont pour fondement et pour but l’extension de la continuité à l’aide de métaphores, d’abstractions et de langages” (891).¹⁵ This is valid for both art and sciences, as they result from the organisation of perceptions *within* the mind. In the *Léonard*, Valéry limits himself to discussing visual arts and music, but, to a certain extent, he probably had poetry in mind too. His take is conscious of the receptive as much as of the creative side. First, artists must receive sensations as they come.¹⁶ If “[l]a plupart des gens . . . perçoivent plutôt selon un lexique que d’après leur rétine” (880),¹⁷ the artist must recognise the actual mental process leading to the final concept, follow it impression by impression, and reproduce its modality. The new sequence will be appreciated in itself, apart from the single elements, as a formal rule, a bounded regularity reduced to its minimal terms that Valéry defines as “*ornement*” (i.e. “ornament”). The latter leads to the appreciation of an organised system in the audience, which spurs in turn its mental replication. In a sense, ornament has the same role in the arts that mathematics has in the sciences (903), as a purely syntactic contemplation of mental images, while giving, at the same time, a mental blueprint for the audience’s own self-variance (more on this later).¹⁸ Art is thus a specific use of the mind as apparatus, created by “abstraction” and

mathematical sense . . . it is only a question of simple intuition, of objects that suggest laws, of laws that are evident to the eyes”; *CW* 8:29). See also 47, n. 10, in this chapter.

¹⁵ “It is certain, in any case, that the basis and aim of every speculation is the extension of continuity with the help of metaphors, abstractions, and special languages” (*CW* 8:31).

¹⁶ A necessity equally recognised by Woolf, though from the point of view of the novel: see ch. 1.3, 76 ff.

¹⁷ “Most people . . . perceive with a dictionary rather than with the retina” (*CW* 8:19).

¹⁸ Ornament is a foundational concept of Valéry’s, as it connects force with form and (creative) act with design in a mutual influence, the appraisal of one causing the other and vice-versa. Morphology, geometry, and syntax drive and are

resulting in a “production d’images mentales . . . plus ou moins énergique” (904).¹⁹ Similarly, in science, mental images allow, through their connection in imagination, to find formal rules behind phenomena. Leonardo, as *homo universalis*, is the perfect prototype to show this process in both domains, but Valéry adds contemporary samples. Faraday, e.g., “voyait des systèmes de lignes unissant tous les corps, remplissant tout l’espace, pour *expliquer* les phénomènes électriques et même la gravitation” (915),²⁰ and similarly Kelvin felt the need to “exprimer les plus subtiles actions naturelles par une liaison mentale” (916).²¹ In their power to connect disparate mental elements and enclose them in systems regulated by common laws, both art and science can be said to be enterprises of worldbuilding.

Thinking and Language

We have seen that imagination (intended as controlled mental sequencing) is for Valéry at the centre of thought, creation, and reception, both in art and science. Importantly, its value is set in the management and reproduction of sense-impressions. That is to say, linguistic codification seems relegated to a secondary role in cognition. The value of words is purely in their effect as mental reflexes, sparkers of determinate mental images. As Jacques Bouveresse wrote, the central thesis of Valéry’s early linguistic outlook is that “les mots n’ont pas de signification vraie ou réelle, qui serait constituée par quelque chose qui leur correspond en dehors du langage et de l’usage pratique” (1983,

driven by creation, mechanics, and dynamics. On the importance of the ornament in Valéry, see Jallat (1982, esp. 49-60), and Dahan-Gaida (2011).

¹⁹ “[A]bstraction”; “production of mental images . . . [which] demands more or less energy” (*CW* 8:46).

²⁰ “[H]e saw systems of lines uniting all bodies, filling the whole of space, and in this way explained electrical phenomena and even gravity” (*CW* 8:58).

²¹ “[T]o express even the subtlest of natural processes by mental images” (*CW* 8:59). See also Kimura (2008, 193-208) for the intertextual relations between the *Léonard* and the work of Faraday and Kelvin.

240).²² I.e., Valéry saw language as the result of an external convention, with no real connection to its referent. At least until the end of the 19th century, he categorically separated thought and expression as “deux moments distincts” (Lacorre 1987, 32).²³ Such attitude led to his despise of philosophy, deemed purely verbal a form of thought, focused on constructs without any actual correspondence: mental idols suffering, moreover, from anthropomorphic preconceptions (see Robinson 1963, 14-22).²⁴ Valéry’s objective for his system was to make a clean sweep of all false concepts and semantic imprecision, devising an artificial language modelled on the mathematical sciences, an *arithmetica universalis* where meaning is determined and controlled by syntax.

It should be noted, in passing, that Valéry’s preference to form and syntax seems to come from poetry as much as from mathematics. In the “Essai sur Stéphane Mallarmé,” began in 1897 and left incomplete after his master’s death, Valéry reflected on the latter’s ability to deploy “un langage qui évitait à chaque instant mes prévisions” ([1897] 1987, 118),²⁵ forcing him to constantly redevise the progression of his thoughts and focus on the nature of the words themselves. He started by limiting the semantic value of single words in reception: “L’action de l’individu sur le mot est nulle. Le dictionnaire nous est donné” (119).²⁶ He then gave his argument on linguistic conventionality (120-21) and proceeded to focus on the phrase as a configuration of elements, which are understood by the receiver “en remplissant les intervalles des mots (ou plutôt des impressions psychologiques nées des

²² “[W]ords have no true or real meaning, which would be constituted by something to which they correspond outside of language or practical use.” To Brian Stimpson, Valéry’s “méfiance” (“mistrust”) for language derived from the study of Leonardo’s work, in which he glimpsed “la possibilité d’une forme de réflexion non-verbale, d’une forme de pensée picturale” (“the possibility of a form of non-verbal reflection, of a form of pictural thought) (2007, 127-28).

²³ “[T]wo distinct moments.”

²⁴ The problem is thus mainly one of reference. Robinson (1963,22) has emphasised the (conceptual rather than genetic) connection between Valéry’s linguistic ideas and those of English analytic philosophy (Russel, Whitehead, Wittgenstein), and of logical positivism (the Vienna circle of Schlick, Carnap, Neurath, etc).

²⁵ “[A] language that defied my expectation at every instant.”

²⁶ “The action of the individual on the word is null. The dictionary is given to us.”

mots) à l'aide de ses propres idées" (123).²⁷ Such linguistic configuration – which, by the way, comes quite close to Umberto Eco's definition of the text as "lazy machine" (1984, 214) – is also a configuration of the self, as an unexpected system of words (hence of sparked images or sensations) will upset the receiver's internal expectations.²⁸ Literature becomes a domain in which all such possibilities are explored, to the point that the very nature of language as conventional means is made apparent. Thus, in poetry (and in Mallarmé's poetry especially), as in mathematics, syntax overrides and controls semantics, allowing to envision a metalanguage that, conscious of its conventionality, permits both analysis and self-analysis.

With time, as will be seen, Valéry's system evolved to accept and account for the inevitable imprecision of its references. Nonetheless, this necessity of syntactic primacy to reach, or get closer to, univocality, paired with the importance given to the visual/formal character of cognition, can be taken as the main cause of Valéry's turn towards mathematico-physical language to express the structure of his system. Mathematics stroke him as a language that, strong of its blatant conventionality, allowed to express not the mind's elements in their vacuous quiddity, but their formal relations: "Faire des mathématiques, – c'est-à-dire rendre visible et tangible tout le travail propre de l'esprit sur une question donnée – introduire éléments et opérations en pleine lumière" (*C* 2:74; *Pl* 2:779).²⁹ On a similar plane, physics allowed him to apply a strict formalisation to an envisioned mental dynamics, described in its operations more than in its essence: "Ce qu'il faut prendre aux Sciences ce n'est pas une vaine analogie de leur lois physiques avec celles de l'esprit – c'est leur rigueur, leur tension, leur difficulté pure, leurs bonnes manières de définir, leur recherche des

²⁷ "[B]y filling in the intervals between words (or, rather, of the psychological impressions born out of the words) with the help of their own ideas."

²⁸ In Eco's terms, Valéry's defied expectations would be at the level of his "discursive inferences" (e.g. the borders of his discursive frame) and have reverberations over his practice of textual decoding.

²⁹ "Doing mathematics, – that is, making visible and tangible all the distinctive workings of the mind faced with a given problem – introducing elements and operations in the full light of day" (*C/N* 4:179).

opérations” (C 2:552; PI 2:834).³⁰ The negative side of the latter quotation, dated 1902, should be attenuated by the fact that Valéry actually used a wealth of physical models (with a healthy dose of adaptations) to help himself better envision the mind’s working. This *penchant* for mental modeling was still recognised in 1941, when he noted how his “faible p[our] les analogies physiques et mécaniques” was explainable by the fact that “les idées physiques sont... des *idées!*, des isolement de phénomènes et images qui ont pour effets de rendre les phénomènes *assimilables*, digérables par l’esprit, et donc, *choses de l’esprit*” reducible to “schèmes d’opérations virtuelles” (C 25:328; PI 2:908).³¹ Although the fundamental aspect of such languages was their precision and strictness – which accounts for the fact that the *Cahiers* are replete with formulaic adaptations of the mind’s operations – Valéry equally enjoyed their potential for visualisation.

The kind of analogical (and metaphorical) reasoning that he relied on was shared, in his opinion, with the scientists. A couple of samples: in a 1893 letter to André Gide, he defined Maxwell’s *Treatise on Electricity and Magnetism* as based on a “métaphore originelle” (Gide and Valéry 1955, 191)³² – i.e., Faraday’s lines of force. And, in 1923, he considered Carnot’s theorem (on the efficiency of heat engines) as based on “une simple métaphore – la comparaison toute gratuite du froid et du bas, du chaud et du haut, le mot: chute” (C 9:375; PI 2:852).³³ Why not, after all? If language is but convention, and thought is formal connection of mental objects, then *any* kind of linguistic representation which can help forming such connections – whether in poetry or in science – is automatically valid, as long as it remains conscious of its artificial nature. As Laurence Dahan-Gaida

³⁰ “What should be adapted from the Sciences is not a vain analogy between their physical laws and those of the mind – it is their rigour, their tautness, their pure difficulty, their proper way of defining, their search for operations” (C/N 4:230).

³¹ “[S]oft spot for analogies with physics and mechanics”; “ideas in physics are... *ideas!*, that isolate phenomena and images in such a way as to make the phenomena *assimilable*, digestible by the mind, and thus, *things of the mind*”; “schemata of virtual operations” (C/N 4:295).

³² “[O]riginal metaphor.”

³³ “[A] simple metaphor – the totally unwarranted comparison between cold and low, hot and high; the word: fall! (C/N 4:246).

wrote: “[D]’un côté, [l’analogie] pose une égalité de rapports et donc elle calcule; de l’autre, elle met sous les yeux, c’est-à-dire qu’elle fait voir. Combinant calcul et imagination, elle fournit un cadre général à partir duquel la pensée, sous toutes ses formes, peut être appréhendée” (2011, 54).³⁴ Or, in the words of Huguette Laurenti, the connecting power of metaphors is an “application à refaire *artificiellement* ce que la pensée fait naturellement” (1987, 56).³⁵ Ultimately, it is this power of reproducing the ways of its object of study that makes analogical language so appealing: “Un langage! Un langage! Pour exprimer non les images mais leur construction, mais leur sort – et tout ce qui, quantité, forces, transformations réglées ou élémentaires,... le fait – *vivre*” (C 3:720; Pl 1:789).³⁶

The *Système*

After having looked at some formal aspects of Valéry’s system, it seems only fair to consider the latter in more detail. An ideally complete model of the mind and its varying relations, the system had a few fundamental traits. We have already come across the notion of *arithmetica universalis*. We have also seen that he conceived the mind as a fundamental and inescapable medium for the appraisal of both internal and external phenomena, characterised by self-variance and the interconnection of three laws (formal, significant, accidental). Most importantly for the present research, mathematico-physical analogies were employed to analyse the mind’s formal dynamics independently from the nature of its specific components.

³⁴ “[O]n the one hand [analogy] poses an equality of relations and therefore it calculates; on the other, it lays bare, that is, it makes one see. Combining calculation and imagination, it gives a general frame from which thought, in every form, can be understood.”

³⁵ “[A] commitment in redoing *artificially* what thought does naturally.”

³⁶ “A language! A language! To express not images but how they are constructed, what fate befalls them – along with everything, quantity, forces, regulated or elementary transformations, that... causes them – *to come into being*” (C/N 5:48).

On the mathematical side, Valéry made use mainly of non-Euclidean geometry,³⁷ topology, and group theory (see Robinson 1963, 70-71; Pasquino 1979, 17-21; Krauthausen 2010, 237 ff.). Topology, or *analysis situs* (as Poincaré defined it in a seminal paper in 1895), studies spatial properties that remain invariant under transformation. It can be applied to geometrical figures in any number of dimensions, as it is strongly intertwined with non-Euclidean geometry. On the latter's side, Valéry was particularly interested in the theories of Bernhard Riemann (later used by Einstein for his general relativity: see ch. 2.2, 139) which allowed for a generalisation of geometrical elements in any number of dimensions through the notion of manifolds.³⁸ Mathematical groups, themselves linked to topology³⁹ are sets of *any kind of* elements characterised by an operation which is such that, when applied to any two elements, the result will still be an element of the group. Groups also enjoy the associative property;⁴⁰ an invariant element (which does not modify other elements in operations);⁴¹ and the fact that each element has its inverse within the group.⁴² As well explained by Steven Cassedy, the importance of groups resides in the fact that they are a “closed, bounded collection of elements, where it is not the elements in and for themselves that are important, but rather the functional principle defining their relation to one another. This is essentially the notion of a system, but with the requirement that the system be self-contained, closed on itself” (1986, 80).⁴³ A group can also contain all the possible transformations that maintain certain elements invariant.

³⁷ Which was developed, in the 19th century, from the negation of Euclid's fifth postulate by such mathematicians as Carl Friedrich Gauss, Nikolai Lobachevsky, János Bolyai, and Bernhard Riemann.

³⁸ On this, and on Valéry's problems with continuity in such model, see ch. 3.2, 250.

³⁹ As they contribute to the definition of topological spaces: see Poincaré ([1895] 2009, 54-60).

⁴⁰ The order of operation does not matter. For example, with addition as the operation, $(a + b) + c = a + (b + c)$.

⁴¹ In the case of the set of real numbers, it could be 1 with product as operation, or 0 with addition/subtraction.

⁴² When an element and its inverse are plugged in an operation, whatever the order, the result is the invariant element.

⁴³ Cassedy, however, fails to recognise the importance of the analogical method for Valéry and, apart from not considering physical analogies at all, poses this kind of reflections as a sort of game (in a negative sense), suspecting that Valéry “did not take his ideas too seriously” (1986, 78). As we have seen, however, analogical reasoning was a much more valuable (and much more elastic) component of Valéry's thought (to which, by the way, he stucked to for 50 years).

These theories allowed for the description of a number of properties and their transformations within a closed mental space, and for analysing the internal structure of a mental space seen as a multidimensional entity in continuous change. Since 1892, Valéry defined such internal hidden relations behind self-variance (in a sense, their transformation group) as “nombres plus subtils” (“more subtle numbers”):

n + s

Ce chiffre de ma première pensée, vers 92 –, cachait mon idée secrète que l’esprit est commune mesure de toutes choses.

Exactement: que les transactions entre tant de choses et de toute nature supposent cette possibilité d’échange, de combinaison, d’association de choses aussi hétérogènes qu’elles le soient et sans doute aussi une nature de ces choses mêmes que s’y prêtent.

L’ensemble de toutes choses comprenant toutes leurs relations définit cet esprit. (C 5:894; Pl 1:798)⁴⁴

Along with this, the presence and focus on an invariant property reflected the search for that essential element that provided unity to a mind, the very nucleus of a self – persisting unmodified by any possible thought and to all of them opposing their inverse – which Valéry will soon define as *Moi pur*, and which is the main topic of the 1919 addition to the *Léonard*, the *Note et digression*.

The system drew its component from physics as much as from mathematics. As we have seen, the mind for Valéry can be described dynamically by referencing to its internal energy. The main model through which Valéry channels this image is atomistic thermodynamics. In the *Léonard*’s first version, the discipline was evoked indirectly through the names of Maxwell and Kelvin (915-16), and

⁴⁴ “n + s

This cypher for my first way of thinking, around ’92 –, concealed my secret idea that the mind is the common measure of all things.

More precisely: that the way so many quite disparate things interact with each other, implies the possibility of exchange, of combination and association between them, however heterogeneous they may be, and doubtless suggests certain characteristics of those things that lend themselves to such a possibility.

The mind is defined by a set of all things including all their relations” (C/N 5:56).

the description of the mind as an energetic and chaotic system already followed the logic of the statistical thermodynamics derived from the kinetic theory of gases.⁴⁵ In *Note et digression*, Valéry is much more explicit. Transformation acquires here a more physical meaning from heat, efficiency, and dissipation, as the mind becomes a thermodynamical machine. Creativity, for example, becomes the art of profiting from such mental energy, which can be put to use only when the chaotic movement of its thoughts/particles is properly bridled: “Quelque grande que soit la puissance du feu, elle ne devient utile et motrice que par les machines où l’art l’engage; il faut que des gênes bien placées fassent obstacle à sa dissipation totale” (*Œ* 1:828).⁴⁶ The randomisation of thought led to the total negation of Romantic inspiration: if “nos plus grandes lumières sont intimement mêlées à nos plus grandes chances d’erreur” (833), the real work of the artist is one of energy control. In this sense, as William Marx has recounted in his introduction to Valéry’s *Cours de poétique*, Valéry’s thermodynamical artwork “exprime paradoxalement un idéal plus haut que les aspirations romantiques à l’expression lyrique du moi, un idéal de type existentiel, celui d’une drogue cognitive visant à la dépersonnalisation du sujet” (Valéry 2023, 1:33).⁴⁷ This, to Marx, took Valéry’s poetics quite close to surrealism. The importance, thus, is not laid on the author’s individual personality, but in the sure standing of his/her mental life’s self-analysis. Valéry’s ideal mind becomes, more than 40 years before Schrödinger’s *What is life* (1944), a system that works against the natural entropy of thought, an ordering machine; this in a period, such as the end of the 19th century, in which entropy as a concept led, in literature, mostly to images of thermal death (see Bruni 2011, 227-28).

⁴⁵ Again in 1933-34, Valéry considered coming back to “mon idée (1892) de considérer *tout le psychisme* (ψ) en bloc comme on regarde la quantité de chaleur d’un système ou une forme q[uelcon]q[ue] de «l’énergie»” (*C* 16:813; *Pl* 1:838) (“[M]y idea (1892) of looking at *the entire psyche* (ψ) en bloc, in the same way that you regard a system’s quantity of heat or some form of ‘energy’”; *C/N* 5:92). Although considering energy as a fundamental component could be ascribed to Ostwald’s energetics, and indeed in 1892 the debate on atoms was far from concluded, the stochastic value of thought in Valéry’s ideas inevitably leads to postulating a primary role of statistical thermodynamics.

⁴⁶ “However great the energy of fire, it becomes useful and a motive force only by virtue of the engines in which it is confined by human skill. There must be well-placed restraints to keep it from being wasted” (*CW* 8:71).

⁴⁷ “[P]aradoxically expresses a higher ideal than the romantic aspirations to the lyrical expression of the self, an ideal of an existential type, that of a cognitive drug aiming at the subject’s depersonalisation.”

Another model, strictly connected with the “nombres plus subtils,” was provided, since 1902, by the concept of Gibbs’ phase (see at least Robinson 1963, 65-67; Pasquino 1979, 25-26), i.e., the idea that conscience, in its heterogeneity, passed through a closed cycle of phases (such as attention or distraction, wakefulness and sleep, in analogy with a passage from solid, to liquid, to gaseous phases) which determined its own possible states. Finally, coming back to the *Moi pur*, and considering both thermodynamics and electrodynamics, the *Note et digression*, as anticipated, shows how a mind such as Leonardo’s, in the ultimate search for its purest component, untouched by its continuous modifications, becomes an image of Kirchhoff’s ideal black body: “[T]ant elle s’est reculée et placée hors du tout, et tant elle s’est appliquée à ne jamais figurer dans quoi que ce soit qu’elle puisse concevoir ou se répondre. Ce n’est plus qu’un corps noir qui tout absorbe et ne rend rien” (*CE* 1:850).⁴⁸ As I will show in ch. 3.2, this concept provided the first link for Valéry to move from a fundamentally thermodynamical to a quantic conception of the mind.

The Relations between Mind and Matter in the Evolving System

While, between the end of the 19th and the first years of the 20th century, statistical thermodynamics was Valéry’s main source of physical metaphors, it was by no means the only one. Electrodynamics too played an important role in his system, often in connection with the nervous system,⁴⁹ as did atomic theories. Valéry was conscious of the recent physical discoveries in the field

⁴⁸ [S]o far has it drawn aside from all things, so great are the pains it has taken *never to be part of anything it might conceive, or of any answer it might find*. It is reduced to a [black body] that absorbs all and gives nothing back” (*C/W* 8:94). The original translation gave (improperly) “dark mass” for the technical term “corps noir.”

⁴⁹ A sample from the 1903-5 *Cahiers*: “Il y aurait dans le corps des masses en connexion réciproque ou non, et d’autres (ou les mêmes par d’autres endroits) sans connexions.

Il y aurait donc des systèmes conducteurs et de systèmes diélectriques.

Alors les courants de conduction seraient la règle – les courants de déplacement seraient – conscience . . .” (*C* 3:454; *PI* 1:787).

(“The body might be considered to be made up of masses, some of which are reciprocally or unilaterally connected, and others (or the same ones in different places) without connection.

of atomic physics, and of the complex relations between matter, energy and radiation (see ch. 1.1), as much from his readings (such as the 1913 *Les Atomes* by his friend Perrin) as from his personal connections.⁵⁰ Thermodynamics already allowed him (and, in part, led him) to consider the mind as a structure whose state was defined by the internal energy derived from the unending processing of ideas/images taken as single chaotic components (like gas particles in a tank). In this sense, encounter with external matter (in the form of sense-impressions) was already hand in glove with modifications of internal energy.⁵¹ Additionally, mental and sensorial impressions shared the same nature in the mind. The successive physical theories could not but strengthen this link, as matter, too, was now characterised by internal movement. Referring to the contemporary atomic theories in his 1922 “Au sujet d’*Eurêka*” (“On Poe’s *Eureka*”), Valéry wrote:

Toute la physique moderne . . . nous montre que la matière est étrangement diverse et comme indéfiniment surprenante; qu’elle est un assemblage de transformations qui se poursuivent et se perdent dans la petitesse, même, dans les abîmes de cette petitesse . . . Il y a une fièvre éternelle dans les corps.

A présent, nous ne savons plus ce que peut, ou ce que ne peut pas, contenir ou produire, dans l’instant ou dans la suite, un fragment d’un corps quelconque. L’idée même de matière se distingue aussi peu que l’on veut de celle d’énergie. Tout s’approfondit en agitations, en rotations, en échanges et en rayonnements. (*Œ* 1:775-76)⁵²

There would be conductive systems and dielectric systems.

In which case, conduction currents would be the rule – the displacement currents would be – consciousness”; *C/N* 5:47). Valéry also often considered the human nervous system as a dynamo: see, for ex. *C* 6:83; *Pl* 2:948.

⁵⁰ See Robinson (1963, 89-90, n. 6).

⁵¹ As a sample, to Michael Whitworth (studying the case of D. H. Lawrence) thermodynamics, and in particular the ideal nature of its second principle (on the inevitable increase of entropy in isolated systems), paired with the actual inevitable permeability of non-ideal machines, automatically raises the existential question “whether a couple, or even an individual, can exist in a perfectly contained system, completely insulated from the outside world” (2001, 66).

⁵² “[M]odern physics has persuaded us . . . that matter is strangely diverse and endlessly surprising; that it is an assemblage of transformations which continue on a smaller scale until they are lost in smallness, in the very abysses of smallness . . . There is an eternal fever in substances. At present we no longer know what a fragment of any given substance may or may not contain or produce, now or in the future. The very idea of matter is distinguished as little as you will from that of energy. Everything at a deeper level consists of agitations, rotations, exchanges, radiations” (*C/W* 8:166-67).

As Robinson argued, matter and mind became “deux aspects différents d’un même phénomène très élémentaire” (1963, 94).⁵³ The issue is strongly connected to the relations of mental phenomena to language: the two dualities form in fact a triad. On the one hand, the mind is the only medium through which reality can be accessed,⁵⁴ while one’s reality is automatically reconfigured by mental forms. On the other hand, mental phenomena are, most often than not, and always imperfectly, linked to conventional language, so that a word can conjure a mental phenomenon (be it genuine or illusory) by its simple presence. This leads to the connection between linguistic organisation and sensorial expectations that Valéry, in the *Léonard*, called perceiving “with a dictionary more than with the retina.” The inherent adaptability of this kind of system derives from a world-vision that recognises both the existence of a reality outside (the particle framework) and the mutual influence – if not the uniformity of nature – between external reality and mental phenomena (the mass-energy framework, with its common behaviours and bilateral exchanges).

If Karin Krauthausen finds a parallel of Valéry’s thought in the 19th century psychophysiology and psychophysics – from Johann Friedrich Herbart to Théodule-Armand Ribot, Wilhelm Wundt, and Ernst Mach (2010, 234) – his own system, allowing for the conservation of energy and its transformation in a complex or chaotic fashion, seems in fact closer (although quite certainly not genetically connected) to certain energetic conceptions of Freud. Michel Serres defined Freud’s psychoanalytic view as inherently thermodynamical, anticipating the complex dynamics of information theory: he described the unconscious as a black box that, by negentropic action (the same that Valéry calls forth in the *Léonard*), temporarily transforms entropic noise into information (1982,

⁵³ “[T]wo different aspects of a single, most elementary phenomenon.” On the refuse of the mind-body dualism, see also Lhermitte (1983, 114), who notices the particularity of Valéry’s thought with respect to contemporary philosophy (and especially Bergson); and Gheno and Pasquino (2015, 40-41), who contrast Valéry’s thought to Descartes distinction between *res cogitans* and *res extensa*.

⁵⁴ “Parler de la réalité du monde extérieure, c’est vouloir mesurer le mètre étalon. Quelle est la longueur de l’étalon de longueur?” (*C* 7:698; *Pl* 1:564) (“Speaking about the reality of the external world is wanting to measure the yard-stick. How long is the standard for measuring a yard?”; *C/N* 5:197).

esp. 82). Although Valéry assigned to language much less value than Freud (as language was to him but the conventional ulterior medium of a more direct medium), their systems apply similar energetic worldviews. Their formal similarity is even closer when Freud deals with phenomena that are less dependent on language: as an important example, Andrea Pasquino has noted the extreme parallelism between Valéry's energetic mind and Freud's energetic *libido* (1979, 25). Whatever the value assigned to language, the world described by thermo- and electrodynamics, especially after the development of atomic physics, forces a connection between mind and matter, and in that way between communication and world-vision. As will be seen in ch. 1.3 and 1.4, both Woolf and Gadda would share such vision: Gadda from a more precisely Freudian and electrodynamic point of view; Woolf less from a Freudian than a more generical fusion between thought and energy, enclosed within a genuinely atomistic view.

Mathematics and physics create two parallel and at times complementary domains for the development of Valéry's system. As anticipated, rigour and symbolisation seem to be only half of the story: Valéry's analogical work taps into a wealth of concepts that make mental structures and internal relations more easily visualisable and manageable. This also means that his system evolved both by itself and thanks to the parallel evolution of the scientific theoretical landscape. While Valéry's mathematical outlook remained quite constant, he profited from the revolutionary growth in physics in the later years. One just has to skim through the 1930 additional commentaries to the *Léonard* to see how he corrected, adjusted, and expanded his past views by referencing to relativity and quantum theories.⁵⁵ In addition, a growing concern for the body as an actor in the game between mind and world led him to move from the first form of his system to a more complex organisation, what he

⁵⁵ Relativity is already named *en passant* in the 1919 *Note et digression* (*CE* 1:858). It gives him a way to perfect his notions regarding space, now inseparable from time and its own contents (894), to reflect on the symmetry of mathematical formulae as a new kind of formal order (891-92) and to update Faraday's lines of force to worldlines (915). Quantum mechanics, at that chronological height, both strengthened the importance of probability calculus (888) and made him doubt that mental images could still be utilised to describe subatomic reality (890-91; 908), which he described as an "*autre monde*" (916) ("*another world*"; *CW* 8:59). See also ch. 3.2 for the further evolution of his thought.

defined the *CEM* (“corps, esprit, monde,” i.e., “body, mind, world”) triad. This new investment in the body is normally connected to his meeting with Catherine Pozzi in 1920, with whom he had a tormented love story until 1928, and was formalised in the *Cahiers* in the following years (see Michelucci 2003, 95-99). Nonetheless, as I will argue in ch. 2.2, the body seems to be already integrated in the system by the composition of *Eupalinos* in October 1920, and profits as much from the newly discovered relativity theory than from Valéry’s personal relations.

The increased complexity of the system’s dynamics throughout the years is paralleled by the end of its linguistic conservatism. Valéry’s *arithmetica universalis* should have been able to unambiguously describe the internal operations between a closed set of constituents. Yet, as Pasquino wrote (1979, 43-49), throughout his linguistic explorations, Valéry started to perceive the intrinsic ambiguity of language. This led to a fuller and freer employ of analogies and metaphors. If Pasquino shows this change by quoting a note from 1911, Pascal Michelucci goes as back as 1900 to note the first “lueur d’une prise de conscience” (2003, 135).⁵⁶ Metaphor evolved from a means to search for a precise language to an object providing both a momentary meaning in the phrase and the spark for a linguistic dynamics in a line of reasoning (136-38). Through analogy and metaphor, language itself became a part of that same transformational movement hypothesised in the *Léonard* for mental images. In fact, metaphors’ semantic fuzziness and connectivity allowed to maintain that very plasticity that is required to avoid the sterile conventional preconceptions which lead most people to “see with the dictionary.” A sample of this view is found in the 1903-5 *Cahiers*: “Je me tiens toujours en relation avec l’informe, comme degré le plus pur du réel – du non interprété. C’est comme le carrefour des métaphores” (*C* 3:364; *PI* 1:34-35);⁵⁷ in 1929, it is fully developed:

L’introduction de *symétries* dans le discours, soit par le son (pieds, césures, rimes) soit dans les idées (métaphores) donne au discours l’aspect de n’être plus *moyen*, acte de circonstance; mais d’exister en soi, de

⁵⁶ “[G]limmer of a realisation.”

⁵⁷ “I remain always in relation with the unformed, as the purest degree of reality – of the non-interpreted. It’s like the crossroads of metaphors” (*C/N* 1:71).

valoir par des qualités intrinsèques – par *plusieurs liaisons de ses moments* – dont chacun a plus d’une relation avec chaque autre. Ainsi une vie humaine, construction d’une personnalité – dont les réactions successives aux événements quelconques font peu à peu une *figure*, un quelqu’un (pour soi et pour autrui). (C 14:301; *Pl* 2:313)⁵⁸

This last passage clarifies the connections between language and mind, in art, theoretical reflection, and identity construction. Differently from the older analysis of Mallarmé’s poetry, language does not reveal itself as a pure means, but as an object that is passible of analysis and further linkages, to be treated itself as a theoretical system.

The value of metaphors for Valéry (and of the analogical reasoning connected to them) is thus fundamentally epistemic and semantically expansive, pointing to complexification more than simplification (in the sense of modern systemics), and to progression more than settling.⁵⁹ In this sense, as Benedetta Zaccarello convincingly argued, Valéry’s system has more epistemic value in its state as a mind’s *analogon* than in its theory’s actual development. His pure language “devient insensiblement moins un code d’abstraction qu’un réseau d’images susceptibles de se traduire les unes dans les autres” (2011, 33),⁶⁰ thus reproducing the mind’s functioning in itself, in an endless evolution. The *Cahiers* themselves (and Valéry’s work in general), following Zaccarello, could then be considered as representations *in fieri*: “L’analyse d’une conscience à l’œuvre ne semble pouvoir se faire . . . que dans une pratique quasi mimétique d’écriture” (36).⁶¹ Continuous and all-exploring,

⁵⁸ “The introduction of *symmetries* into discourse, either through sound (metric feet, caesura, rhymes) or through ideas (metaphors) makes discourse appear to be no longer a *means*, a circumstantial act; but to exist in its own rights, to have its *various moments* – each having more than one connection with another. Thus also a human life, the construction of a personality – whose successive reactions to events of any sort little by little make up a figure, a someone (for oneself and others)” (*C/N* 1:352).

⁵⁹ See also Michelucci (2003, 42-44), who exalts the transitory character of Valéry’s metaphor in the search for the right formalisation. It seems to me, nonetheless, that Valéry’s protean metaphors, at least in their later form, do not seem to be actually pointing towards a specific end.

⁶⁰ “[G]radually becomes less a code of abstraction than a net of images that can be translated one into each other.”

⁶¹ “The analysis of a conscience at work seems to be only doable . . . through an almost mimetic writing practice.”

such transformative process cannot but possess what Pasquino calls a “libertà ludica” (1979, 129)⁶² which ends up rediscovering the metaphorical value of those very scientific and apparently precise elements from which it started. It would thus be useless to evaluate Valéry’s analogies and metaphors by an absolute compliance to the specifics of scientific language. Their potential is rather expressed in the variety of forms they deploy to describe the same phenomenon: the mind and its processes.

From Poetry to Storyworlds: Consistency

As we have seen from the *Cahiers*, metaphors eventually come to contribute to an analysis of poetic products as systems in themselves, reproducing and enhancing the human mind’s behaviour. Despite his evolving linguistic theory, Valéry always reserved such a possibility to poetry alone (in parallel to scientific language), spurning prose, and the novel in particular, for the random character of its events and formal structure. In his 1927 conference entitled “Propos sur la poésie” (“Remarks on Poetry”), published a year later, he defined the effect that poetic emotion has on its audience by its sparking of a “*sensation d’univers*” (*CE* 1:1726):⁶³

J’ai voulu dire que l’état ou émotion poétique me semble consister . . . dans une tendance à percevoir un *monde*, ou système complet de rapports, dans lequel les êtres, les choses, les événements et les actes, s’ils ressemblent, *chacun à chacun*, à ceux qui peuplent et composent le monde sensible, le monde immédiat duquel ils sont empruntés, sont, d’autre part, dans une relation indéfinissable, mais merveilleusement juste, avec les modes et les lois de notre sensibilité générale. Alors, ces objets et ces êtres connus changent en quelque sorte de valeur. Ils s’appellent les uns les autres, ils s’associent tout autrement que dans les conditions ordinaires. Ils se trouvent, – permettez-moi cette expression, – *musicalisés*, devenus commensurables, résonants l’un par l’autre. (1726)⁶⁴

⁶² “[P]layful freedom.”

⁶³ “[S]ensation of a universe.”

⁶⁴ “I meant that the state of poetic emotions seems to me to be consisting . . . of a tendency to perceive a *world*, or a complete system of relations, in which beings, things, events and acts, although they resemble, *each to each*, to those

In this sense, music, for Valéry akin to mathematics, is the art that can best allow for such pure organisation, as every sound is crafted perfectly by instruments “qui sont, en réalité, des *instruments de mesure*” (1730),⁶⁵ and calls for an external system of connections which is already in place: “*un son qui se produit évoque à soi seul tout l’univers musical*” (1731).⁶⁶ Human language, having been created for pragmatic purposes (1730), is much more rough-and-ready: each word allows not only for different pronunciations (according to the speaker’s accent) but also for “[p]lusieurs sens, car les images que chaque mot nous suggère sont généralement assez différentes” (1732).⁶⁷ Poetry thus becomes an attempt to produce music with words, inducing the feeling of a closed system – while prose focuses on meaning transmission and on the conveyance of an “illusion de la réalité” (1738).⁶⁸ Valéry shows here a contempt for what we now call immersion, defining it as “une sorte d’aliénation” and a “*crise de crédulité*” (1738),⁶⁹ thus confining prose’s reception to a linear flowing of concepts.

Valéry’s “sensation d’univers” seems very close to Paul Ricoeur’s ideas regarding the epistemic properties of poetry. Not only does Ricoeur take inspiration from Valéry by defining poetry as a “prolonged oscillation between sense and sound” which “converts language into matter” ([1975] 2003, 265), he also draws a parallel between poetry and scientific models by focusing, like Valéry did, on the relations of sense imposed by metaphors. Starting from the work on Max Black and of Mary Hesse, Ricoeur interprets scientific models as particular *ways of talking* about an object of study, and emphasises the role of metaphors in the otherwise impossible connection that they draw between

which populate and compose the sensory world, the immediate world from which they are derived, they are, on the other hand, in a relation which is indefinable, yet marvellously right, with the ways and laws of our general sensibility. Then, these known objects and beings somewhat change in value. They call each other, they associate in quite different conditions from the ordinary. They find themselves – allow me this expression – musicalized, they become comparable, resonating one with the other.”

⁶⁵ “[W]hich are, in fact, *measurement instruments*.”

⁶⁶ “[A] *sound which is produced evokes by itself the whole musical universe*.”

⁶⁷ “[M]any meanings, as the images suggested by each word are in general quite varied.”

⁶⁸ “[I]llusion of reality.”

⁶⁹ “[A] kind of alienation”; “*credulity crisis*.”

what is explained and the language that explains it, so that “to have recourse to models is to interpret rules of correspondence in terms of extension of the language of observation through metaphorical usage” (286). In this way, metaphorical language shows its epistemic potential by changing the way to look at the objects, providing “*redescription*” (287). In a similar process, poetry obtains epistemic results similar to those of a scientific model not through the single metaphors but through the entire “metaphoric network” that is instantiated by the poem as a whole. Extending the Aristotelian relation between *mimesis* and *mythos* (i.e., between denotation and poetic fiction) to poetry in general, Ricoeur argues that it is through the “elevation of feeling to fiction” (290) that poetry can become mimetic. By forming metaphorical networks that link inner life and external world, “[p]oetic feeling in its metaphorical expressions bespeaks the lack of distinction between interior and exterior” (291). This scheme parallels Valéry’s correspondence between poetic structure and the audience’s “sensibilité générale,” and highlights the value of metaphorical reference in poetry and its link to mental phenomena and imagination. It provides a fictional interpretation of poetry that comes very close to that of fictional worlds, in that it assigns to poetic creation an artefactual value as imaginary construction, and links it to the actual world by accessibility relations based on sensibility.

What about prose? When it comes to the novel, Valéry’s amateurism has become proverbial. As Silvio Yeschua argued, Valéry “produit son idée du roman beaucoup moins par l’analyse poussée ou méticuleuse d’un ou des plusieurs romans donnés, que comme ‘*réponse*’ à son idée de la poésie pure” (1976, 140).⁷⁰ His conception, in fact, is much more based on a generic idea of 19th century realism than on what was actually happening in literature in his time. Moreover, despite his own official position, Valéry did not spurn prose at all. In fact, he experimented with it even more continuously than with poetry – through essays, personal notes, fictional dialogues, drama, and brief narratives such as his *Monsieur Teste* and his *Histoires Brisées* (“*Broken Stories*”). In Brian Stimpson’s words, his short stories are a form of “counter-fiction,” being “metonymic, partial, indicative, unconstructed,

⁷⁰ “[P]roduces his own idea of the novel much less from the driven or meticulous analysis of one or more given novels, than as a ‘reaction’ to his idea of pure poetry.”

disjointed” (1998, 142), and spurning the possibility of reaching a completely objective system, a “reality” outside the mind. Alternatively, his prose sometimes tries to reproduce (as in fact did his ideal poetry) the chaotic bundle of the esprit’s possibilities. Therefore, fiction also allows Valéry to “envisage [the] hypothetical resolution” (142) of his system’s problems. That is, prose too creates complete structures that, if not as grounded on phonetics and syntax as poetry, are to be numbered among the hyper-organised, strongly interrelated, and complex storyworlds which surge from modernist fiction.

A sample of Valéry’s fictional experimentation is the cycle of *Monsieur Teste*. “[C]réature exceptionnelle d’un moment exceptionnel” (that of the crisis following the *nuit de Gênes*) whose existence “ne pourrait se prolonger dans le réel pendant plus de quelques quarts d’heure” (*Œ* 1:1012),⁷¹ Monsieur Teste is what Lubomír Doležel would call an “alethic alien” (1998, 119), a figure whose (in this case mental) capacities are aberrant with respect to his own world. He is, in fact, the main element of difference between his storyworld and the actual world. Modelled on Edgar Allan Poe’s monsieur Dupin (see Blüher 2006, 69), Teste is the impossible realisation of Valéry’s closed system, a being that can completely follow and control the mechanism of his own mind: “Il était l’être absorbé dans sa variation, celui qui devient son système” (*Œ* 1:1019).⁷² He is the closest being possible to an automaton which, as Jed Deppman wrote, “self-transforms through self-seeing” (2003, 205) because he sees, perfectly, his thought through his own thought: “Je suis étant, et me voyant; me voyant me voir, et ainsi de suite” (*Œ* 1:1028).⁷³

Fictional solution to Valéry’s theoretical issues, experimental model of a thinking practice, Teste follows the evolution of his creator. In “La Soirée avec Monsieur Teste” (1896), he is described by the homodiegetic narrator as an isolated system, a genius who avoids the dissipation of his internal

⁷¹ “[E]xceptional creature of an exceptional moment”; “could not survive in reality for more than a few quarters of an hour” (*CW* 6:5).

⁷² “He was a man absorbed in his own variations, one who becomes his own system” (*CW* 6:12).

⁷³ “I am being and seeing myself; seeing me see myself, and so forth” (*CW* 6:21).

energy through his social seclusion: fame can only result in “*énergie dissipée à se transmettre*” (1016).⁷⁴ Together with the narrator at the theatre, he sees not the events on stage, but the mental dynamics resulting from the artwork’s reception in the spectators’ minds (1021-24). In 1924, following Valéry’s increasing interest in the body as an actor in the *CEM* system, the “Lettre de Madame Émilie Teste” (“A Letter from Madame Émilie Teste”) describes a new Teste who, behind his usual mental domain, shows signs of opening, in the form of erotic desire as discovery (1034-35), and of love as the power to “*être bêtes ensemble*” (1037).⁷⁵ His increasing interest in the *Moi pur*, as seen from the *Note et digression*, is reflected a year later in the “Extraits du Log-book de Monsieur Teste” (“Extracts from Monsieur Teste’s Logbook”), where the hidden part of the self is described in a prayer as “ce noir que je regard quand je pense” (1042),⁷⁶ thus coming back to the notion of the black body. As Valéry’s system increasingly moves from a thermodynamical to an atomic description, the “Lettre d’un ami” (“Letter from a Friend”; first published in 1924) portrays the *esprit*’s variation in the face of the *Moi pur* as the polarity between an electron and a proton – “un gros *électron positif*” (1056).⁷⁷ The former continually points at the varying of sensation and thought, while the latter incessantly repeats its own invariant existence.

The *Léonard* can be taken as a more general case, and reveals the link between the poetic “sensation d’univers” and the worldmaking practices of fiction. Behind the essayistic form and the homage to a historical person lies the creation of a fictional character: Valéry ventures to “imaginer un homme” and comments, in 1930, that his character came from a personal reflection on “*le pouvoir de l’esprit*” (*Œ* 1:867).⁷⁸ Being a *homo universalis*, Leonardo’s mind is *in itself* a world-hypothesis, a *Gedankenexperiment* that produces a worldview, which is in turn reproduced by the text. Imagining Leonardo’s mind engenders the imagination of the world in which Leonardo lives, not an objective

⁷⁴ “[E]nergy [dissipated] in conveying himself” (*CW* 6:9).

⁷⁵ “[B]eing silly beasts together” (*CW* 6:30).

⁷⁶ “[T]hat darkness [but, more literally, “that black”] I look into when I think” (*CW* 6:35).

⁷⁷ “[A] large *positive electron*” (*CW* 6:51).

⁷⁸ “[I]magine a man”; “the power of the *mind*” (*CW* 8:5).

world from a totally omniscient viewpoint, but one examined by envisioning an all-encompassing, yet human, viewpoint, which includes and describes its own functioning mechanism. To someone refuting Cartesian dualism, hence strong objectivity, like Valéry, it is the best possible outcome:

Nous arrivons à nous représenter le monde comme se laissant réduire, çà et là, en éléments intelligibles . . . Les tentatives demeurent lacunaires. C'est ici le royaume de notre héros *Il a un sens extraordinaire de la symétrie* qui lui fait problème de tout. A toute fissure de compréhension s'introduit la production de son esprit. On voit de quelle commodité il peut être. *Il est comme une hypothèse physique*. Il faudrait l'inventer, mais il existe; l'homme universel peut maintenant s'imaginer." (891; my emphasis)⁷⁹

Leonardo's "sense of symmetry" parallels the role of poetic language in the domain of mental creation. Valéry took it from Edgar Allan Poe's idea of consistency. As he explained in "Au sujet d'*Eurêka*," "[d]ans le système de Poe, la *consistance* est à la fois le moyen de la découverte, et la découverte elle-même . . . L'univers est construit sur un plan dont la symétrie profonde est, en quelque sorte, présente dans l'intime structure de notre esprit" (774).⁸⁰ Consistency connects the *locus* of truth to the structure of the human mind, starting from the premise that universe and mind are of the same nature. We are back to the mind and matter confusion at the centre of the modernist enterprise. Yet, importantly, Poe's system secured its own objectivity by deriving from God's creation (and arriving in fact at a pantheistic worldview: see Poe [1848] 1984, 1357-59; and Scapolo 2011, par 16-17). Valéry's system, as our other authors', instead, accepted the mind's structuring because, despite the conviction that there is a world *out there*, it is only through the mind that we can access it. No absolute truth to be found, only experimentation. Fictionality is thus not a problem in itself, for Valéry: as

⁷⁹ "We have arrived at the conception that parts of the world let themselves be reduced, here and there, to intelligible elements . . . The attempts remain lacunary. It is here that we find the kingdom of our hero. *He has an extraordinary sense of symmetry* that makes him regard everything as a problem. Wherever the understanding breaks off he introduces the productions of his mind. It is evident how extremely convenient he can be. *He is like a scientific hypothesis*. We should have to invent him, but he exists; the universal man can now be imagined" (*CW* 8:31-32; my emphasis).

⁸⁰ "In Poe's system, *consistency* is both the means of discovery and the discovery itself . . . Poe's universe is formed on a plan the profound symmetry of which is present, to some degree, in the inner structure of our minds" (*CW* 8:164).

Rossana Gheno writes, “come le matematiche, anche la letteratura è un esercizio della mente, e non la descrizione del mondo reale” (2015, 67);⁸¹ thought experiments share this same property. The problem that Valéry finds in (his idea of) the novel is, rather, the imposition of a certain random sequence as inevitably and objectively true.

Consistency (with the given corrections to avoid the trap of pure objectivity) will remain a central concept throughout this study. I would go as far as to say that consistency is a fundamental character of any storyworld that allows itself to be analysed in its general structure. Notably, its particular kind of symmetry is strictly linked to the property of a part to roughly reproduce, or hint at, the whole’s formal character (as the interconnection of Leonardo’s mind reproduces the interconnection of Leonardo’s world, and Teste’s automaton mind contemplates its own ideal form): a property which draws a lot of its power from analogical linkage. This was already typical of Poe’s universe in *Eureka*, as he considered galactic systems as roughly analogous in their behaviour to the atoms that composed them ([1848] 1984, 1324). The works (and the physical theories) analysed in section 2 and 3 of this study will similarly spark particular mental images, usually in the form of objects, that will hint at the deeper structure of the world in which they (cannot but) exist, thus enforcing the thought-experimental character that I have described in the “Introduction.” They will not possess such characters in themselves, according to a “strong objectivity” view, but show them by observation or interaction (of/with the characters as much as the readers). Most importantly, they will also contain points of singularity, of irresolvable character, allowing to glimpse at the main problems that their own fictional worlds (having lost the assurance of God’s perfection) are trying to make apparent. In this sense, it is consistency that drives the reader to find an answer, to fill in the blanks like Leonardo.⁸² This is reflected in a common interest, for our three authors, in the readers’ hermeneutic activity, and

⁸¹ [L]ike mathematics, literature too is an exercise of the mind, and not the description of the real world.”

⁸² A consistency that can hit, in Gadda’s case at least, the very nerve of the impossibility of dealing with the complexity of interconnections, as interconnection itself, in its constant reconfiguration, becomes the grounding symmetry of the world.

in their willingness to *actively* solve (or being induced to solve), or, when impossible, at least to formalise, the issues presented by a storyworld. In Valéry's case, as Barbara Scapolo wrote, this translates in a view of thought as an act, and of the artwork as a step in that act, to seize a reality that keeps leaving a space for integration:

Ce qui donne sa consistance à l'œuvre et à l'auteur, c'est la capacité de résistance de l'œuvre elle-même. On peut donc affirmer que plus une œuvre échappe au déchiffrement (qui correspond toujours à une réduction), plus la part de réalisme qu'elle renferme est grande. C'est seulement de cette façon que l'œuvre parviendra à satisfaire 'l'idéal de l'écrivain': contenir aussi bien une 'valeur excitante' qu'une 'valeur répondante,' autrement dit, se présenter à la fois comme 'excitant et aliment.' (2011, par. 12)⁸³

We have seen the main aspects of Valéry's world-vision: his collapse of the material and the mental; his atomistic, energy-driven model to describe the mind in relation to the real; and the kind of relationship established between linguistic and mental phenomena, emphasised by a continuous practice of analogical reasoning. The result of such interconnected and dynamic model is directly reflected in his artworks. As will become apparent in the next two chapters, both Woolf and Gadda will share many of these premises, and develop them in their own personal fashion.

⁸³ "What gives consistency to the artwork and its author is the artwork's own capacity of resistance. It could thus be affirmed that the more a work averts deciphering (which always corresponds to reduction), the bigger is the element of realism that it contains. Only in such a way will the work manage to satisfy the 'ideal of the writer': to contain an 'exciting value' as well as a 'responding value,' in other words, to present itself as 'stimulant' and 'nourishment' at the same time."

*Atomic Epiphanies**Virginia Woolf, Lucretius, Radioactivity*

On the 18th of April 1939, starting her fragmentary memoir *A Sketch of the Past*, Virginia Woolf recounted three episodes of revelation (what her readers have come to know as “moments of being”) which struck and paralysed her during her childhood. Older and more resilient, Woolf considered such visions as a “token of some real thing behind appearances” to be made “whole” by “putting it into words” (*MB* 72). From this, she reached “what I might call a philosophy”

that behind the cotton wool is hidden a pattern; that we – I mean all human beings – are connected with this; that the whole world is a work of art; that we are parts of the work of art. *Hamlet* or a Beethoven quartet is the truth about this vast mass that we call the world. But there is no Shakespeare, there is no Beethoven; certainly and emphatically there is no God; we are the words; we are the music; we are the thing itself. (72)

For Woolf, writing was a way not only of coping with the shock of exceptional or traumatic moments, but also, and more importantly, of searching for the hidden connections of the real, invisible at first sight, and requiring alternative representations. She partook, in this sense, in the common strive that characterised all the disciplines of her society, and to which she was always intensely receptive. As Gillian Beer wrote, “her relations to her daily surroundings, to the streets and conversations of London, to the books she reviews, the parties she records, to political events, and to philosophy, science, Dante, Montaigne, are all equally appetitive” (1996b, 3).

Born in 1882 from a wealthy Victorian family, daughter of the eminent humanist Leslie Stephen, she experienced a series of deaths from young age: her mother Julia Duckworth in 1895, her half-sister Stella in 1897, her father in 1904, and her brother Thoby in 1906.¹ To these traumas were added the sexual abuses by her half-brothers, George and Gerald Duckworth. The death of her mother seems to have been the occasion of her first nervous breakdown, and a more severe case occurred after her father's demise: throughout her life, Woolf had to struggle with her mental conditions (see Lee 1997, 171-96). Nonetheless, she became one of the most important modernist writers of her time, an influential activist for women's rights, and one of the central figures of the famous Bloomsbury group, publishing several novels and short stories, as well as a huge number of reviews and literary essays, along with her work for Hogarth Press, founded in 1917 with her husband Leonard Woolf.

Her prose can be considered as one of the most visual of her century, and was probably influenced by her closeness to painters and art critics such as her sister Vanessa Bell and her husband Clive Bell, but most of all by her close relationship with Roger Fry. Woolf considered Fry's exhibition on *Manet and the Post-Impressionists* (from November 1910 to January 1911) as a milestone in the modernist cultural revolution and a final detachment from the Victorian era. As she wrote in her 1924 essay "Characters in Fiction" – reprinted one year later as "Mr. Bennett and Mrs. Brown" – "on or about December 1910 human character changed" (*E* 3:421). As we will see throughout this work, the unmistakable vividness of Woolf's narration translates into a network of images – in the form of literal or metaphorical descriptions, interior monologues, or epiphanic moments – that, like brushstrokes on a canvas, pile up and harmonise to create complete systems, in the effort not only of bringing about aesthetic feelings, but also of searching for that hidden "pattern" beyond the veil of appearances. Woolf's work is then, as much as Valéry's and Gadda's, part of an epistemic enterprise that is aimed at the structures of reality. I will be looking at Woolf's relations with physics as either a parallel and similarly invested activity, or as something which, as much as, and often through the lens

¹ For Woolf's biography, see the work of Hermione Lee (1997).

of, art and philosophy, contributed to Woolf's literary work. In so doing, I am taking into account the fact that physics was but a piece of Woolf's diverse interests, and that she certainly made a free and completely independent use of it.

With this in mind, I will start my journey through Woolf's literary visualisations by having a look at the imagery related to atoms in some of her short stories.² Atoms are a good example of an unpicturable quid, their presence being discernible only through the analysis of the trace they leave. The advancements in their study were appreciated by Woolf's contemporaries since Thomson's discovery of the electron in the Cavendish Laboratory at Cambridge in 1897 (see ch. 1.1). Before that, atoms had been variously pictured in science and in philosophy. Regarding Woolf's repertoire, limiting the choice to a selection of short stories will provide a good specimen of her work, both for the chronological span they encompass, and because of their character as representational thought experiments. As Laura Marcus suggests, short stories were "the arena in which Woolf tested out the visuality of writing, and the connections between word and image" (2016, 35). Moreover, as has been often recognised, their very structure is best suited to enclose epiphanies, or "moments of being," usually in the form of visions in the eyes of the characters. While mental depictions can be developed both in mimesis and diegesis, through literal or metaphorical content, epiphanies come to the fore as the most vivid kind of representation, encompassing a story's epistemic core.

Given these premises, I will try to answer several questions, all related to the issues on literature, science and representation that we are tackling in this section: first of all, what is the value of atomic imagery in Woolf's narrative, and how is it connected to her literary style? Secondly, what inferences can be drawn from such representations simultaneously deriving from different cultural areas, and what kind of world-vision derives from this analogical process? And at last, is there a persistence in Woolf's atomic imagery throughout her literary career? To provide an answer, I will first focus on

² Woolf's short stories have become a topic of interest especially in the last fifteen years. For general further reading, apart from the works quoted in this article, see Drewery (2011); on the poetics of objects in the short stories, see Gasston (2014); on posthumanism: Swanson (2012).

one of Woolf's best-known references to atoms, presented in the essay "Modern Novels" (1919), to show how she combines scientific contemporary atomistic views with the classical one pictured in Lucretius' *De rerum natura*. The results of this first inquiry will guide the actual interpretations of Woolf's short stories, to prove the importance of such blending, and its value for Woolf's narrative in general. Moreover, my reading will highlight the prominence, in Woolf, of a model using atomic and energetic views to look at the phenomenon of love and erotic attraction that will also be important as a comparison to Gadda. To do so, I will also take a brief detour in the storyworld of *To the Lighthouse* (1927), which will however be analysed more in detail in the next section.

Raining atoms

"Modern Novels" came out in the *Times Literary Supplement* on April 10th, 1919, and was then republished with some modifications as "Modern Fiction" in the collection *The Common Reader* by Virginia and Leonard's Hogarth Press in 1925. This short essay is one of the main expositions of Woolf's poetics. In it, Woolf laments the state of affairs of British fiction, whose long history does not seem to be connected with an increase in expertise. In particular, she sets out to refuse the tenets of the contemporary literary field, dominated by what she defines "materialist" writers, namely H. G. Wells, Arnold Bennett, and John Galsworthy. As a counterpoint, she proposes James Joyce, whose *Ulysses* was being serialised in the American *The Little Review*, as a new model of spiritual writing. The main problem she finds in the materialist trio is their compliance to, and endorsement of, novelistic conventions which defy plausibility while invariably forcing writers to represent "scenes of tragedy, comedy, and excitement, an air of probability so impeccable that if all his figures were to come to life they would find themselves dressed down to the last button in the fashion of the hour" (*E* 3:33). Real life, she asserts, is much messier, much more difficult to encapsulate:

The mind, exposed to the ordinary course of life, receives upon its surface a myriad impressions – trivial, fantastic, evanescent, or engraved with the sharpness of steel. From all sides they come, an incessant shower of innumerable atoms, composing in their sum what we might venture to call life itself; and to figure further as the semi-transparent envelope, or luminous halo, surrounding us from the beginning of consciousness to the end. Is it not perhaps the chief task of the novelist to convey this incessantly varying spirit with whatever stress or sudden deviation it may display, and as little admixture of the alien and external as possible? (33)

Various scholars have already examined the use of the term “atoms” here, usually taken as a metaphor. Michael Whitworth considers it as “merely rhetorical pseudo-science” (2001, 106) that colours Woolf’s style in substitution of a plainer “perceptions.” Craig A. Gordon, in linking Woolf’s reflections to the coeval research in bioscience, suggests instead that she “chooses her language carefully” in order “to approach the space of psychological interiority upon which so much rides in terms not simply of the mind, but of the atomic interactions that constitute the bodily processes upon which consciousness depends” (2007, 138). He thus sees (I would say correctly) a link between mind, body, and environment, defined in his view through a psycho-physical terminology connected to the nervous system. Even though the strong visuality of the concept proposed calls his attention, he simply compares it to the idea of the “Heraclitean stream” (139) – although what we have here is a “shower” – to construct a link with William James’ stream of consciousness. Finally, and on a completely different note, Morag Shiach studies the article through the “year-study” methodology, to define a network of connections between different authors and scientists in 1919. Her work delineates the importance of atomic theory in the culture of the time, especially represented by Ernest Rutherford’s research, and in coeval literature. On such basis, Shiach refuses Gordon’s materialist reading, seeing instead a tentative redefinition of modern novels’ object of interest. To her, Woolf is emphasising “that the most compelling aspects of life that the novelist should capture are best understood as the cumulative effect of multiple minute sensations and experiences rather than as a solid and readily quantifiable experience of the material” (2018, 61). This reveals the “importance of abstract pattern . . . to the processes underpinning human cognition” (61). In this claim, the atom

plays a paramount but ambivalent role, as Shiach defines it both as an image and a metaphor, and its visual aspect, linked to the “substance of water” (61), brings some uncertainty. In spite of this, she sees too much proof towards her interpretation.

Apart from Whitworth’s quick dismissal, both Gordon and Shiach recognise how Woolf’s illustration somehow involves chaos and water. In fact, Woolf’s portrayal of the nature of reality strikes for its vividness also because it is inspired by one of the most pictorial works of poetry of the classical period: Lucretius’ *De rerum natura* (first century b.C.), an exposition of the universe according to the Epicurean philosophy. In Lucretius’ view, reality is composed of a mixture of void and matter, the latter being reducible to various shapes of indestructible atoms. In their falling down, the minuscule particles are subject to infinitesimal stochastic deviations (a phenomenon called *clinamen*, the Latin translation for the Epicurean term *παρέγκλισις*, “*parénklisis*”), which lead to changes in their direction and therefore to their aggregation and disaggregation. To explain this invisible process to his reader, Lucretius resorts exactly to an image of the rain, which we find reconfigured in Woolf’s “shower of atoms.” I am quoting from a copy of the edition and translation possessed by Virginia:³

quod nisi declinare solerent, omnia deorsum,
imbris uti guttae, caderent per inane profundum,
nec foret offensus natus nec plaga creata

³ Among the books owned by Leonard and Virginia, now in the Washington State University Libraries, there are five copies of the poem. One of them, edited and translated by H. A. J. Munro (see Lucretius 1864) is signed with the initials “VW” and presents Woolf’s personal annotations. I decided, in search of correspondences, but with no hope of being exhaustive, to quote from a copy of the latter edition. For the sake of clarity, I specify both the book and verses of the quoted passages, and the page of the text (which is both in original and in translation). The text is freely accessible in the *Internet Archive* (Accessed in December 2023). See <https://archive.org/stream/titulucretiarid01lucr?ref=ol#page/n7/mode/2up>. For the Washington State University Libraries’ archive, see King and Miletic-Vejzovic (2003).

principiis: ita nil umquam natura creasset. (1864, 61; 2.221-24; my emphasis)⁴

There is no doubt that, although they swerve in every direction, Woolf's atoms are acting as rain. A few lines after the quoted passage, she encourages her readers (and most of all the novelists among them) to use their mind as a screen, capturing the traces of the atoms hitting it: "Let us record the atoms as they *fall* upon the mind in the order in which they fall, let us *trace the pattern*, however disconnected and incoherent in appearance, which each sight or incident *scores* upon the conscience" (*E* 3:33-34; my emphasis). Note, already at this chronological height, the reference to the "pattern." Regarding the analogy between mind and surface, although Woolf is not explicit, it should be noticed that a fluorescent screen was a typical tool for both X-ray imaging and for the analysis of atomic components shot from radioactive material. Fluorescent material on the end of the positive side of a cathode-ray tube, for example, was used by J. J. Thomson in 1897 in Cambridge's Cavendish laboratory, to help proving that cathode-rays were actually composed of particles (the electrons). Rutherford and his team in Manchester, instead, used a metal plate for their gold-foil experiments between 1908 and 1913. Once hit by alpha particles which were ejected by radium and either passed through, or were rebound by, a gold foil, the plate would emit a flash (technically called a scintillation). After receiving there his bachelor in 1897, Rutherford rejoined Cambridge in 1919 (although probably after Woolf's writing of "Modern Novels").⁵ Not only were radioactivity and X-ray imaging famous worldwide and already used in literature (the former by H. G. Wells, for example, see ch. 1.1, 39),⁶ but Woolf would also have been cognisant of the kind of experiments happening in Cambridge from her family and friends' connection with the university (see Banfield

⁴ "If they were not used to swerve, they all would fall down, like drops of rain, through the deep void, and no clashing would have been begotten, nor blow produced among the first-beginnings: thus nature never would have produced aught" (Lucretius 1864, 61).

⁵ On Thomson and Rutherford experiments, and the equipment used in them, see Crease and Mann (1996, 12-19).

⁶ Additionally, as Whitworth noted from Woolf's early diaries (2001, 150), in 1897 Woolf ended up accidentally at a conference on X-rays.

2014). In April 1918, Woolf also noted in her diary how Walter Lamb “[t]old us stories about J. J. Thompson [*sic*], whose mother keeps a small shop where Watty used to buy sweets as a boy” (*D* 1:138), which highlights her knowledge of and indirect connections with the physicist. These elements can be added to those already underlined by Shiach showing the large popularisation of the experiments (2018, 62-64). Together, they strengthen a physical interpretation of the mind-surface metaphor, showing that Woolf was reading Lucretius through modern physics, and mixing the characters of the two theories.

Coming back to the second part of Woolf’s passage on the shower of atoms, the almost phantasmal “semi-transparent envelope, or luminous halo” that surrounds us – for so she asks the readers to “figure” it – is in direct relation to another lively verbal depiction, that of the *simulacra*, i.e., atomic emanations that

quasi membranae summo de corpore rerum
dereptae, volitant ultroque citroque per auras,
atque eadem nobis vigilantibus obvia mentes
terrificant atque in somnis . . . (Lucretius 1864, 154; 4.31-34)⁷

This passage in particular has been already commented on, although *en passant*, by Susanna Rich (1999-2000, 253), who analysed the intertextual relations between *The Waves* and the *De rerum natura*. At this point, it should be clear to the reader that Woolf’s “sudden deviation” of the atoms represent the *clinamen*, and that her depiction of the life of the mind and the senses reflects the Epicurean one.

If the link-by-image is not enough, poignant verbal correspondences can be added. “Modern Novels” starts with the question if literature has improved in any way during the years. Woolf’s worries that writers simply “keep moving . . . with a circular tendency should the whole course of the

⁷ “[L]ike films peeled off from the surface of things, fly to and fro through the air, and do likewise frighten our minds when they present themselves to us awake as well as in sleep” (Lucretius 1864, 154).

track be viewed from a sufficiently lofty pinnacle,” but that such a view is impossible, everybody being “on the flat” and envying the writers of the past “whose battle is won and whose achievements wear so serene an air of accomplishment” (*E* 3:31). This opening passage repeats the same terms used by Munro in his translation of the proem of Lucretius’ second book, the well-known description of the blissful condition of the sage, for whom nothing is sweeter “bene quam munita tenere / edita doctrina sapientum templa serena, / despiciere unde queas alios passimque videre / errare” (1864, 51; 2.7-10).⁸ Other passages in Lucretius, moreover, refer to the link between atomic deviation and human freedom, as well as human creativity.⁹ In conclusion, the whole essay starts and develops under the sign of Lucretius, and hardly the contemporary educated readers would have failed to notice these references. On the other hand, the link to contemporary physics seems equally present but less explicit. Another hint that Woolf had in mind, but refused to openly show, physics’ atoms in her essay (apart from the aforementioned mind-as-surface metaphor) is the modification of her comments on Joyce’s “Hades” episode of *Ulysses* from the journal version to the collection *The Common Reader*. In 1919, she describes what appears in the narration as “so much that, in its restless scintillations, in its irrelevance, its flashes of deep significance succeeded by incoherent inanities, seems to be life itself” (*E* 3:34). Here “scintillations” might refer to the aforementioned flash of light released by mediums such as metal plates after the passage of a charged particle. The term disappears from the 1925 version “Modern Fiction” and is substituted with “brilliancy,” while the flashes are specified as “lightning flashes” (*E* 4:161). This reference to lightning, by the way, inclines me towards an interpretation of “scintillation” in atomic instead of astronomical sense. It is as if Woolf changed the term to avoid non-literary references, but still wished to retain the image that came with it.¹⁰

⁸ “[T]han to hold the *lofty* and *serene* positions well fortified by the learning of the wise, from which you may look down upon others and see them wandering” (1864, 51; my emphasis).

⁹ The clinamen is linked to free will: see Lucretius (1864 62; 2.251-61). Moreover, the innumerable simulacra that float in the void are considered to be what produces mental images, so that their unusual combination sometimes brings to mind the imagination of mythical creatures (185-86; 4.722-48).

¹⁰ It seems clear that, if Woolf allows for the presence of some scientific terms in her texts, she does not want science to be *directly and unambiguously* explanatory. This is not only apparent from the kind of use that she makes of science,

Let us recall the mental picture proposed in Woolf's quotation. What does it bring to the fore in ontological and epistemological terms? First of all, it involves an idea of actuality as chaotic composition of parts. If the *clinamen* makes so that what one perceives arrives "[f]rom all sides," one loses any privileged point of view. In addition, not only are human beings on the receiving side of the "shower," indeed they are part of it, being made of the same substance (Lucretius' distinction is instead on form) and contributing with their own emanations to the general "luminous halo" of life's simulacra (nothing but atoms are the latter, for there is nothing but atoms and void). Thirdly, as Woolf repeats more than once, these atoms are falling directly on our minds (on their "surface": spatial outline is paramount to text-driven imagination) and even though Lucretius himself uses the term "mentes," it is hard to overlook that the senses are bypassed – or better said, are included within the system of the mind itself, which we can observe introspectively. And finally, as I have already hinted, hardly could we consider the representation as a one-way stream: if things have a general direction, they can also come back by deviation.

Putting these characters together, what we have is an ontological system of beings that are in direct contact with each other, willingly or not, human and non-human, animate and inanimate, looking at the world from within their mental borders but extending their presence and influence beyond their individuality. As Michel Serres – who brilliantly analysed Lucretius' poem as a full-fledged treatise of natural philosophy – put it, "[t]he theory of simulacra is a theory of communication: edges, envelopes, wraps, flying through object space, as objects or from transmitters to receptors . . . Knowledge is not seeing, it is entering into contact, directly, with things; and besides, they come to us" (2000, 106-7). And if, for Serres, all senses, sight in the first place, are thus reducible

but also by her theoretical claims. In the 1920 essay "Freudian Fiction," she gives an argument against the latter genre by denying any interest in a kind of literature that is sacrificed to external and all-explanatory theories: "Yes, says the scientific side of the brain, that is interesting; that explains a great deal. No, says the artistic side of the brain, that is dull and has no human significance whatever. Snubbed and discouraged, the artist retreats; and before the end of the book the medical man is left in possession of the field; all the characters have become cases; and our diagnosis is now so assured that a boy of six has scarcely opened his lips before we detect in him unmistakable symptoms of the prevailing disease" (*E* 3:197).

to touch – as the simulacra are films – for Woolf senses are catalysed “on the surface” of the mind: touch sparks mental vision. To this, we should add the fact that Woolf is here interested in proposing a practice of fictional writing as epistemic and experimentalist exercise: that is, she is linking the novel to the analysis of sensation, with the goal of finding some clue to the world’s structure (its pattern). Both internal sensation and external objects are thus to be expressed through language, and language has, symmetrically, to be first and foremost a tool of direct representation. Woolf too, like Valéry (and, we will see, Gadda), is trying to present a world unhinged from any conventional compromise: to bring back a kind of primary textual seeing that is not, in Valeryan terms, hidden behind the dictionary. What seemed at first a simple metaphor is in fact the surface appearance of a deep analogical reasoning, a declaration that breaks the borders between poetics and ontology. Gordon is therefore right, at least in principle: whether we accept or not that Woolf is directly referring to the turn-of-the-century neurophysiology and psychology, she indisputably linked the mind with the material world that surrounds it. As he hints on various occasions, it is indeed possible that her own psychophysical condition influenced this worldview.

Yet, how could the atoms of Lucretius connect with those of contemporary physics? We should consider Gillian Beer’s remark that “[a] term may inhabit very different intellectual-historical periods simultaneously within a specific reader” (1989, 5): as was made clear, atoms were part of the contemporary discourse and could not be overlooked. Importantly, however, they bore both similarities to and differences with Lucretius’ particles, so that a conceptual blending of the two frameworks, the Latin and the modern, could result very profitable in literary and philosophical terms. I am using the term conceptual blending, here and in the future, in the sense given by Fauconnier and Turner (2002), not necessarily to endorse their claims in neuropsychological terms, but because the model provides a clear way to present the structural aspects of Woolf’s atomic metaphors. Blending is a process involving imagination, analogical reasoning and metaphor at its core, and as such can include what we have analysed of Valéry’s model of the mind (and what we will see of Gadda’s own systemics). Nonetheless, Woolf’s atomic model, being a bit more straightforward, is also the most apt

to be looked at from such a framework. In Fauconnier and Turner's terms, blending, or conceptual integration, is a mental cross-space mapping involving various mental spaces:¹¹ two (or more) input spaces, containing the frames of the concepts, a generic space which hosts the common elements of the inputs, and a blended space. The latter contains certain, but not necessarily all, elements coming from both inputs, but also an emergent structure that is not in the two inputs and only derives from the analogical process. It is the emergent structure that makes blending (and thus analogical reasoning and metaphors, which are samples of it) epistemically valuable, as it produces new concepts that can, moreover, be projected back onto the input spaces (see 2002, 39-50). Blends can be of various types, depending on the complexity of the network that is constructed, but I would say that Woolf's blending between Lucretius' atoms and the atoms of contemporary physics can be considered as a double-scope network, in which the inputs have "different (and often clashing) organizing frames" each giving "central contributions to the blends" and proving "rich clashes" that make for "highly creative" results (131).¹² In this sense, the frame "Epicurean/Lucretian atom" provides the concepts of water-like motion (connectable to Brownian movement), of simulacra, and, as will be seen, of the latter's connection with love, which were central in Lucretius' fourth book of the *De rerum natura*; on the other hand, the frame "physical atoms" allows for non-material field-like relations, energy in the form of radiation, and the analysis of internal properties through atomic emissions. Therefore, when Woolf applies her atomic metaphors (be it explicitly or by using some of its visual characters), thus producing in fact a blending (as metaphors are the result of a blending, and probably the most

¹¹ Mental spaces are "small conceptual packets" that "contain elements and are typically structured by frames" and would correspond neurologically to "sets of activated neuronal assemblies" (Fauconnier and Turner 2002, 40).

¹² Despite both frames deploying the term "atom," I would not consider this a "mirror network," i.e. a simpler network in which both inputs share the same frame (see Fauconnier and Turner 2002, 121-26). Indeed, the differences between Epicurean philosophy and atomic physics are too big to allow for it, first and foremost because the former's atoms are indivisible and eternal (Lucretius 1864, 22-27; 1.483-598).

characteristic kind, in Fauconnier and Turner's view), the "atom" input space is oftentimes already the result of a precedent blend between Epicurean philosophy and physics.¹³

In the following part, after precisising a bit more the physical side of the atomic blending, I will attempt to explore it in Woolf's short fiction, maintaining the focus on her guidance to the reader's imaginative act.

Visions and Nuclei

On the Lucretian side of atomic imagination, we have water, rain, multiplicity, and chaos. Some of these elements are in line with the modern framework: the common matrix of substance, the ideally infinite quantity of particles, the fast chaotic movement. But the physical side provides a more complex kind of internal configuration, the equivalence between mass and energy (and therefore light, or "lightning flashes") brought about, even before Einstein's famous formula, by radioactivity, and the great space between the components of the atoms. On this last issue Bertrand Russell opened his 1923 *ABC of Atoms*. After having proposed the classic image of the dinner-table as apparently substantial, he quickly disavowed it:

Science, however, compels us to accept a quite different conception of what we are pleased to call "solid" matter; it is, in fact, something much more like the Irishman's definition of a net, "a number of holes tied together with pieces of string." Only it would be necessary to imagine the strings cut away until only the knots were left. (1923, 1)

¹³ In sticking to the theoretical bases of Fauconnier and Turner to avoid complications, I am nonetheless aware that conceptual blending has been already used in plenty of occasions by scholars of narratology or literary cognitive studies, to analyse both poetry and prose. In the specific case of Woolf, for example, Sarah Copland has provided an analysis of *The Waves* based on the concept (see Copland 2014, but also the entire collection of which Copland is a chapter).

Such defilement of solidity is followed by the classic description of the atom as a solar system. Since neutrons would be discovered only in 1932, up to then the structure of the nucleus (incredibly small, heavy, and energy-loaded) was instead – again Russell – “not simple except in the case of hydrogen; in all other cases, . . . a complicated system consisting, in all likelihood, of electrons and hydrogen nuclei (or protons, as they are also called)” (2). This, by the way, led to a wealth of problems in terms of charge/mass ratios. Most of the times, despite Rutherford’s 1920 neologism, protons would often be simply called “hydrogen nuclei.” Modelled on ancient Greek, the word hydrogen means, literally, “water generator”: I would like the reader to keep this information for later.

Did Woolf know this? The already quoted primary sources and critical literature hints that she did. I would add that, from the short stories, she appears to be up to date in terms of the phases of the scientific advancements. In “A Society” (1920), whose first part is set in 1914, one of the protagonists quotes, among the “marvels of civilisation,” that “man . . . penetrates to the heart of an atom” (*HH* 125). The expression might come from the title of a newspaper article about a conference by Rutherford in June 1920, few months before Woolf set out to write the story.¹⁴ If this is the case, then the reference hints directly to Rutherford’s gold-foil experiments taking place in Manchester until 1913. It should be now added that, apart from the interest in the purely scientific research, atomic and early quantum theories also had a role in the philosophical questions that were discussed within the Bloomsbury group, especially in terms of the classic idealism/realism debate. As Banfield explained (2000, 5-7), the question was posed by the stunning differences between what physics described and what instead the senses perceived, and came to Bloomsbury mainly through the work of Bertrand Russell and Alfred North Whitehead. When Woolf urged writers to pay attention to the atoms composing life, she was indeed referring to the fundamental, if hidden, character of reality. This leads back to Lucretius and the simulacra, since for him what was perceived was matter itself, and if the atoms composing it could not be distinguished, due to humans’ imperfect perception, they could still

¹⁴ See “Heart of the Atom.” *Times*, 4 June 1920, 11.

be pictured in the mind. In fact, even Russell seems to have had Lucretius as a model to describe particle behaviours. Once again in *ABC of Atoms*, single particles are “liable to *sudden deviations* when they find themselves very near to the electrons or nuclei of atoms that stand in their way” (23; my emphasis). Here the *clinamen* is adapted to electromagnetic influences, but maintains its stochastic essence.

As I wrote, epiphanies are paradigmatic moments of narrative imagination, where reader and character share a perspective which reveals a secret side of existence. Therefore, within the small and hyper-focused storyworlds portrayed by the short stories, epiphanies can concentrate in a single vision the ontological standpoint conveyed by the text. Before I go back to Woolf’s earlier stories, I would like to look at a sort of counterexample. Written in 1931, “Scenes from the Life of a Naval Officer” is a caricature portraying the dehumanising and dystopic character of the English navy. Julia Briggs, without making any reference to physics, has quoted it to emphasise the “significance of ‘seeing’, of perception and viewpoint in Woolf’s work” (2006, 178). Indeed, that of Captain Brace is a sort of negative epiphany, which confers vision (and control) over the world but is not accompanied by an actual comprehension of it, if not in utilitarian terms. He resembles a sort of Laplace’s demon: his calculations based on the reading of an “invisible substance” arrive at “a design of such immense elaboration and exactness that each stroke seemed to create an immortal object that would endure precisely so for ever” (*HH* 226-27). Even more striking than this parody of the artwork *aere perennius* is the ability of his eyes: “Whatever came before them – wall, mirror, brass rod – they passed through as if nothing had any solidity to intercept them. So he marched as if he followed in the wake of the beam cast by his eyes up an iron ladder onto a platform” (227). Indeed, the beam could be X-rays (as Whitworth would say: see 2001, 159 ff.) or even Rutherford’s alpha rays, yet it is clear that the parodied captain sees the space between the components of the atoms. Nonetheless, this supernatural quality paradoxically lessens him. He is ultimately an “idol” (226), a human instrument (fusing, at the end, with a telescope).

That of declared solidity, or actual lack of it, as linked to opposite perspectives (we could call them the materialist and the spiritualist, using the terminology of “Modern Novels”), is one of Woolf’s oldest preoccupations. Already in 1906, this opposition is defined in terms of distinction/confusion of beings. In “Phyllis and Rosamund,” the former of the two sisters is reassured in her Victorian frame of mind while talking to an old man at a party: “he told her facts, and she was glad to realise that the world was full of solid things, which were independent of her life” (23). On the other side of the barricade, and from the summer of the same year, Miss Mary V. of “The Strange Case of Miss V.” is united to the autodiegetic narrator by a “tie of blood” not despite, but because of her apparent lack of solidity: when the narrator turns her back to her at a party, “she seemed to melt into some armchair or chest of drawers,” while meeting her on the street is described as “to run against her – or pass through her or dissipate her, whatever the phrase might be” (31). Although the character is described as insignificant, the narrator wakes up crying out her name on the day of her death.¹⁵

While these few metaphors hint at a non-materialistic view of reality (since Miss V. is not completely solid, as if on the verge of dissolution into the chaotic cloud of the world, and comes back to her friend’s mind – epiphanic moment – as a sort of emanation), the reference is still to non-subatomic particles: molecular arrangements into solid, liquid and gas. At this early stage, Woolf seems to be tentatively looking for a language to express her own world-vision, experimenting with simple physical concepts. In this sense, it is interesting to note that, a few months after writing this story, just after Thoby’s death in November, Woolf will read the *De Rerum Natura* (see Lee 1997, 228).

More than ten years later, when atoms and radioactivity were more solidly integrated into the public discourse, Woolf’s textual illustrations align Lucretian confusion with atomic lack of solidity and, importantly, internal energy. The question of the mutual influence between the human and the non-human pops up more frequently, as her stories venture to present dreamlike scenarios that open

¹⁵ As proof of the long-lasting value of the short stories for Woolf’s major works, Mary V. shares the same immaterial connection to the story’s protagonist as Mrs. Ramsay to Lily Briscoe in *To the Lighthouse* (see ch. 2.3, 189 ff.).

alternative interpretations of world's phenomena while exploring the possibilities of the interior monologue. Since atoms fall directly, as she wrote in "Modern Novels," on the surface of the mind, it is the latter that makes sense of them: every reality is therefore personal. In "The Evening Party" (probably from 1918, and in any case with 1921 as *terminus ad quem*), the first-person narrator guides the reader in a world made out of such confusion, where the solid and the evanescent collide. The whole text starts with a mixture of visual elements, from a point of view that is impossible to clearly define, and ends with a mixture of voices that we cannot attach to concrete people. The result is a long succession of textual pictures that strike with their vividness – many elements, from gauzes to flowers, are among those that Scarry (2001) recognises as ways to solidify the dream-by-the-book – while referring to the same topics discussed in "Modern Novels." Indeed, it is a narrative counterpart of the "shower of atoms," amplified by the loss of density in which the mind of the narrator melts. Let us limit ourselves to this passage:

Can it always look like this? – is this not the essence – the spirit? Something has dissolved my face. Through the mist of silver candle light it scarcely appears. People pass me without seeing me. They have faces. In their faces the stars seem to shine through rose coloured flesh. The room is full of vivid yet unsubstantial figures . . .

'Wonderful! Wonderful human beings! Spiritual and wonderful!'

'But they don't exist. Don't you see the pond through the Professor's head? Don't you see the swan swimming through Mary's skirt?'

'I can fancy little burning roses dotted about them.'

'The little burning roses are only like the fireflies we've seen together in Florence, sprinkled in the wistaria, floating atoms of fire, burning as they float – burning, not thinking.' (90-91)

How should we read this? If the narrator and her companion are watching from outside (and this we can but surmise, as the text does not certainly help) it could be interpretable as the play of reflections in the windowpanes, so that the two protagonists mix with the crowd inside, which in turn fuses with the sky and the pond outside, while the lights of their cigarettes move about in their hands.

In this way, we would distinguish the solid things, re-establish the borders, and bring some materialist sense into such confusion. “Yet how sad a thing is sense! How vast a renunciation it represents!” (93): the utterance of the narrator’s friend seems directed at once at her and at the reader. Refusing commonsense rationalisation means finding the commonality of the matter composing the universe and its ultimately unsubstantial character. The atomic essence of the people at the party is revealed, and they are not only imagined as fused with the water, but they burn with energy. The systemic connection goes further, across time, as the “floating atoms of fire” lead to a shared remembrance of the two characters.

A similar association between insects, flowers, water, remembrance, and the apparently a-logical connection of the world’s system was already present a few months before in “Kew Gardens” (1917). There, one of the characters visually recalls his failed proposal upon a lake in the same park, with a dragonfly close to him and the lady he used to love: “the whole of her seemed to be in her shoe. And my love, my desire, were in the dragon-fly; for some reason I thought that if it settled there, on that leaf, the broad one with the red flower in the middle of it, if the dragon-fly settled on the leaf she would say ‘Yes’ at once. But the dragon-fly went round and round” (85). As can be seen, the images evoked are similar in kind to those of “The Evening Party” and refer to the same framework that indissolubly connects the mind and the world. A few lines later, the character’s current wife identifies the people in the garden with the ghosts of her past. Another couple of characters, two old ladies walking, leads the reader to connect atoms, sensation, and words, reinforcing the parallel between reality and language. The discourse of the women is cut into pieces – “Nell, Bert, Lot, Chess, Phil, Pa, he says, I says, she says, I says . . .” – while one of the two, fixing her attention on some flowers, “stood there letting the words fall over her” (87). Again, the description comes back to the shower of “Modern Novels.”

I would argue, however, that Woolf’s use of the atomic energy model produced its best results in the expression of erotic feeling and creativity. To this we move.

Eros as Energy

We have seen the energetic nature of atoms expressed both in terms of watery fluidity and of fire-like radiancy. While the image of water can be derived from Lucretius' classical shower of atoms, light is more closely related to the properties of modern atoms. Russell, to give a contemporary example, explained the discovery of internal atomic energy thanks to radioactivity in the *ABC of Atoms*:

The amount of energy packed up in an atom is amazing, considering its minuteness. There is least energy in the outer electrons, which are concerned in chemical processes, and yield, for instance, the energy derived from combustion. There is more in the inner electrons, which yield X-rays. But there is most in the nucleus itself. This energy in the nucleus only came to be known through radio-activity; it is the energy which is used up in the performances of radium. (1923, 8)

The study of the energetic emissions of the atoms, through the spectroscopy of light and X-rays released from outer and inner electrons, as well as the analysis of the alpha, beta, and gamma rays from the nucleus after radioactive decay,¹⁶ were the only means to study the innermost structure of matter. Quoting Arnold Sommerfeld, Russell described the particles shot from atomic nuclei as “envoys from a world which is otherwise closed to us” (121). The idea of extreme energy and secrets contained in the “heart of the atom” spoke well for their use in the context of narration of epiphanies, and could also lead to an analogy with human interiority. Here more than ever, the two paradigms' combination deploys the emergent structure of the blending which feeds Woolf's atomic metaphors. The connection with Lucretius' atoms allows for a joint interpretation of radioactive emissions and

¹⁶ Alpha and beta rays are actually particles, the former are composed by two protons and two neutrons (thus are positively charged helium nuclei), the latter by a highly energetic electron or positron; gamma rays are instead highly penetrating radiations. See also ch. 1.1. As I wrote before, the fact that neutrons were unknown until 1932 led to the belief that atomic nuclei contained more protons than were actually present, along with some electrons (a neutron weights more or less as much as a proton and an electron).

simulacra, thus doubly justifying their value as information-bearers sparking mental phenomena. To this could be added the aforementioned reference to protons as “hydrogen nuclei,” which was still used in the twenties, and the etymological meaning of hydrogen: “water generator.” All these features are connected, in Woolf’s work, to the idea of eros as a form of energy linking human beings, which can be wasted and dispersed, or fuel knowledge and creativity. We should here make a sudden deviation to *To the Lighthouse* (1927), on which Woolf was working around 1926. We are in the first section of the novel, “The Window”: after spending most of his afternoon in the vain research for the next step in his ideas, now filled with self-doubt and with his ego at risk of instability, the philosopher Mr. Ramsay approaches his wife. The scene is seen from the perspective of their son James, in the form of an epiphany:

There he stood, demanding sympathy.

Mrs. Ramsay, who had been sitting loosely, folding her son in her arm, braced herself, and, half turning, seemed to raise herself with an effort, and at once to pour erect into the air a *rain of energy, a column of spray*, looking at the same time animated and alive *as if all her energies were being fused into force, burning and illuminating* (quietly though she sat, taking up her stocking again), and into this delicious fecundity, this *fountain and spray of life*, the fatal sterility of the male plunged itself, like a beak of brass, barren and bare. He wanted sympathy. (*TL* 42-43; my emphasis)

Talking while releasing light impulses by “flashing her needles” (43), Mrs. Ramsay restores her husband to his own narcissistic self-confidence by acting like an energy-radiating atom, losing its life through decay. Rain, energy, burning force, light, fountain: the blended atomic metaphor is here hidden behind all the elements that we have seen up to now more overtly in the short stories. Its presence is nonetheless made clear by the drafts: in the back of a first attempt at the scene, Woolf annotates: “She [i.e., Mrs. Ramsay] is pouring forth like radium from every cell. A prodigal waste of feeling” (*TLDrafts* 140). And waste indeed it is, as after having felt the “rupture of successful creation” Mrs. Ramsay feels “exhausted in the body” (*TL* 44) and is tormented by the idea that

someone might think her “finer than her husband” (45). Woolf is thus representing the woman’s emotional coercion and her waste of creativity within the bounds of traditional Victorian family. This is done by using a framework that allows to both recognise female individuality and dilute it in the immaterial contact between interiorities, therefore showing its very impermanence and ontological depletion in her contemporary society.

This kind of energetic model, connected to narcissistic egocentrism, seems close to Freud’s concept of libido (see ch. 1.4), but we should remember that Woolf did not read Freud seriously until 1939. Up to then, Woolf probably had both a cursory knowledge and a very low opinion of his theories, despite the fact that psychoanalysis was an intellectual cornerstone both of Bloomsbury and of the Hogarth Press.¹⁷ Moreover, as noted by Elizabeth Abel, in the novel Woolf seems to repropose James’ Freudian Oedipal narrative as an inherently repressive process, as the eventual Oedipal connection with his father leads him to renounce the “material/maternal” essence of Mrs. Ramsay for the sterile linguistic classifications of philosophy (1989, 57, but see 45-58). Freud’s presence in the novel seems thus more largely connected to Oedipus’ theme and, in general, refuted rather than asserted. Ann Banfield has cited Mrs. Ramsay’s scene, among other passages in Woolf’s literature, to argue for a connection between the egocentric male “I” and the phallus,¹⁸ interpreting Mrs. Ramsay’s connection to fluids as female ejaculation: “Ejaculation becomes the accomplishment of castration; the ‘I’’s reduction is a detumescence. It displaces both ejaculation and the depletion subsequent to erection onto the woman” (2000, 172). Connecting this elements to Bertrand Russell’s condemnation of the subjective “I” for empirical analysis, Banfield proposed a similar view in Woolf: the self must

¹⁷ Both her brother Adrian and his wife Karin, as well as James Strachey, brother of Lytton, and her wife Alix, were psychoanalysts. The latter two translated Freud’s texts for Hogarth Press, which was the first UK editor to publish the psychoanalyst’s complete works. Woolf collaborated to the publication but with scarce interest for the contents. She seemed to feel that psychoanalysis was ineffective as a cure and was threatened by its power as a narrative tool. On these topics see Abel (1989, esp. 13-21); and Platt (2010, 155-61).

¹⁸ The war against the I-phallus is a common objective both for Woolf and for Gadda, for whom “I” is “[i]l più lurido di tutti i pronomi” (“the most lurid of all pronouns”; *RR* 1:635) and the main source of evil in the study and functioning of reality.

be cut out to produce art, as “loss of personality is the condition of knowledge” (174). As Timothy Mackin counterargued, however, “Woolf clearly does have her suspicions of the ‘I,’ but that doesn’t mean she is willing to abandon the personal” (2010, 121): her interest and consideration of inner life seems to have a value both as an artistic object and as the producer of art (as we will clearly see in ch. 2.3).¹⁹

I would argue that the framework of atomic energy to describe inner life and desire helps clarifying this point, as it weakens the solidity (rigidity) of the I while maintaining the value of personality and internal drives as creative forces. This is seen even more clearly in the short story “Moments of Being: ‘Slater’s Pins Have No Points’” written in 1926-27, thus around the same period of *To the Lighthouse*,²⁰ and published in 1928. The story introduces Fanny Wilmot and her reflections over her piano teacher Julia Craye, building up to a love scene between the two:

All seemed transparent for a moment to the gaze of Fanny Wilmot, as if looking through Miss Craye, she saw the very fountain of her being spurt up in pure, silver drops. She saw back and back into the past behind her . . . She saw Julia open her arms; saw her blaze; saw her kindle. Out of the night she burnt like a dead white star. Julia kissed her. Julia possessed her. (*HH* 214)

Here, again, the blended atomic metaphor takes the form of a fountain of light, with Julia’s essence being transmitted and appearing to Fanny in the form of various scenes of her life, like simulacra or subatomic particles ejected from an atom. The reference to the “dead white star” not only plays on the analogy between the atomic model and the solar system (with the nucleus being the sun), but also on the fact that X-ray spectra were used to analyse the stars’ atomic compositions. It is

¹⁹ It should be noted that, deriving love from the effect of simulacra, Lucretius connects them to ejaculation (1864 198-99; 4.1030-57), only to later condemn love as folly with the classical Epicurean arguments. Here, instead (and in the next example) simulacra and ejaculation are made into a single creative effusion, so that the process acquires an opposite value.

²⁰ As Susan Dick wrote in her note, “Moments of Being” is among the “side stories” born out of *To the Lighthouse* which Woolf mentions in her diary: see *HH* 299 and *D* 3:106.

a moment of epiphany and knowledge which, however, does not translate here in a loss of life for the emitter. In fact, by giving away her inner energy, Julia manages to possess Fanny, breaking that isolation that, like a “pane of glass” (210), prevented her from fully enjoying aesthetic feelings: “It’s on the field, it’s on the pane, it’s in the sky – beauty; and I can’t get at it; I can’t have it” (211). Thus, once freed from the clutches of tradition, egotism, and heteronormative male dominance, inner feelings and desire become a form of energy fuelling connection, beauty, and knowledge.

In the ontological fight between realism and idealism, Woolf is compelled to recognise the truth of the shower of atoms as well as that of the mind upon which they fall. And if reality cannot be seen outside of the mind, and what the latter receives is real, then the two partake in life in such a way that they become indistinguishable. One’s thinking, one’s past, one’s remembrances, are as true as anything outside. Modern physics helps the case, in its venture to prove the common nature of matter and energy. Even without knowing the specifics of quantum theory, at this chronological height the concept of the atom, especially if coming from a blending between Lucretius’s model and the contemporary one, inevitably led to refute the distinction between *res cogitans* and *res extensa*. In the following years, the fusion of matter and mind, sometimes along with the relativity of space and time, will be variously conveyed. In some cases, as in “The searchlight” (1939), it is linked to light rays, in the form of a light shone upon the characters by a military aircraft exercising in the night sky, which brings back to Ms. Ivimey a memory of her past linked, again, to her experience with a telescope. In an in-depth analysis of the story, Holly Henry has interpreted the telescope (capturing the light reflected by objects and making them closer or further according to the side from which one looks) as a time machine (2003, 51-57). Finally, in “The symbol” (1941) written a few months before Woolf’s suicide, lack of solidity is instead connected to death and loss of meaning.

In conclusion, while this overview does not have the pretension to be complete, it is still sufficient to show that atoms play a fundamental part in Woolf’s work to provide a deeper understanding of human relations which, like in Valéry and in Gadda’s case, shuns superficial conventions. Atoms are fundamental not only to define Woolf’s poetics and epistemology, but also to

clarify some of her best textual visions, as they are the key to unlock the meaning of many of the epiphanies occurring in her narrative. They provide, moreover, a view connecting mind and matter through the equivalence between matter and energy given by both physical studies of atomic structure and radioactivity and Lucretius' philosophy of atomic simulacra. While this model is generally applied by her, it gives its best results when connected to the experience of erotic connection, considered from a non-heteronormative perspective as the fuel of creativity. As we will see in the next chapter, Gadda's own model is also strictly connected with the concept of physical energy, this time mixed with Freudian psychology, yet gives, for various reasons, quite different results.

*Physical Models and Erotic Drives**Carlo Emilio Gadda, Systemics, Freudian Libido*

Known at first for his literary works by a happy few, Carlo Emilio Gadda became a national success only after publishing the 1957 mystery novel *Quer pasticciaccio brutto de via Merulana* (“*That Awful Mess on the Via Merulana*”). Born from a bourgeois family of Milan, soon fallen into poverty for his father’s ill-advised commercial enterprises and untimely death, he was pressured (or so he liked to declare) by his mother, with whom he always had a difficult relation, to graduate in electrotechnical engineering at Milan’s Polytechnic University. The outbreak of the First World War interrupted his studies: at first a convinced interventionist, he enrolled in the Alpine regiment, but the war took his certainties, along with his brother’s life. Having been captured after Caporetto’s battle, he returned home only at the beginning of 1919, and graduated in 1920.¹ He worked as an engineer in Sardinia, Argentina, Vatican, but mainly for the company Ammonia Casale – which specialised in producing synthetic ammonia – travelling around Europe to supervise or promote its plants. He also tried to graduate in philosophy between 1924 and 1929 (see Lucchini 2000), but renounced just a step away from the degree.² He then moved first to Florence, in 1940, trying to survive on his own

¹ His wartime experience, as well as his transition from an interventionist position to a spite of the world conflict and the Italian disorganisation that led to senseless massacres, are described in the journal that he wrote in real time, *Giornale di guerra e di prigionia* (“*Journal of War and Imprisonment*”), which was published in its entirety only in 1992. Partial versions came out in 1955 and 1965 (see the note to the text: *SGF* 2:1103-25).

² For a biography of Gadda’s early life, until the beginning of the ‘30s, see Roscioni (1997).

writings, and afterwards, in 1950, to Rome, where he was employed by the RAI, the national public broadcasting company, until 1955.

Gadda's literary work comprises novels (mostly unfinished), short stories, and countless articles on the most disparate topics, among which one should mention 34 scientific and technical divulgations.³ His style has been recognised as one of the century's most peculiar, a baroque and macaronic pastiche that mixes the aulic, the technical, the regional, and the vulgar. He jealously (and somewhat maniacally) kept everything he wrote:⁴ the various archives containing his notes and drafts still reveal unexpected philological pearls. Many of his works are the result of a reorganisation of previous pieces, sometimes many years old, which were dug out, modified, and reconfigured into new stories. In fact, such entanglement reproduces the framework of his own world-vision, one that highlights connections and interactions between objects, texts, and disciplines. In this dissertation, for what concerns literary production, I will focus on Gadda's mature period, which will include literary works published between 1943 and 1957 (with the conscience that various texts were actually written before). It is there that Gadda's literary use of scientific language is mastered and used with most creative freedom, as noted by Paolo Zublena (2002, 46 ff.). If the reasons for this delayed evolution are not certain, I feel that, along with a disinterest for science in the Italian culture, more inclined towards idealism, to which he was addressing his texts (see Antonello 2012), the fascist dictatorship might have played a repressive role, especially when it came to both Einsteinian and Freudian theories, as he once stated in an interview to Alberto Arbasino (Gadda 1993, 92).

³ The topics include hydroelectric and thermoelectric plants, the production of metal alloys, the properties and uses of nitrogen, history of science, and more. Written mostly in the thirties, some of them engaged, at least in their form, in the modes of Fascist propaganda. 24 of them can be found in *SVP*, while other 10 were collected later and edited by Manuela Bertone (see Gadda 2005). These are also online: <https://www.gadda.ed.ac.uk/Pages/resources/essays/gaddafasind.php>.

⁴ He also made lists of his archival materials: the first available is from 1908, when he was only 13. See Gadda 2003, 7.

Gadda's reflections are informed by technical-scientific practice and characterised by a strong empiricist drive. As such, Pierpaolo Antonello has emphasised how Gadda's thought is pre-eminently technical and pragmatically oriented. Theoretical science, in his view, has a more general influence:

La scienza nell'opera di Gadda entra più come presupposto metodologico che come contenuto nozionale specifico (numerosi sono comunque i riferimenti alla neuro-fisiologia, alla geologia o alla chimica). Gli scienziati e il fare della scienza non popolano la sua prosa, ma contribuiscono a definire l'abito mentale della razionalità e dell'esattezza che conforma il suo metodo di indagine della realtà. (2005, 29)⁵

Physics, not listed here, seems brought together with technical engineering. Antonello's work (the best on the topic today) is on point for what concerns technique. However, as I hope to show – in part here, but especially in the next two sections – along with its methodological tenets, specific notions and models drawn from theoretical physics play a relevant part in Gadda's system and prose, although not always explicitly. This takes nothing away from Gadda's highly pragmatic view: simply put, theory is materialised (thus made imaginable), sometimes in most peculiar ways.

In this chapter, I will start by introducing the main element of Gadda's own philosophy, as has been put down in his only philosophical work, *Meditazione Milanese* ("Milanese meditation"; published posthumously in 1974), and consider its reverberations on the issue of mind and matter's duality. I will connect these traits to Gadda's own linguistic and stylistic theories, with particular attention to the role of metaphors and analogies, and a special eye for physics. I will emphasise the importance of these features within Gadda's artistic ideals, which aim at an epistemic use of literature. I will then explore this practice through the antifascist pamphlet *Eros e Priapo* ("Eros and Priapus"), in the original version from 1944-45 which was discovered and published only recently. The analysis

⁵ "Science in Gadda's work enters more as a methodological prerequisite than as specific notional content (numerous nonetheless are the references to neuro-physiology, to geology or to chemistry). Scientists and the performance of science do not populate his prose, but contribute to define the mental habitus of rationality and exactitude that characterises his method of investigation of reality."

will show Gadda's metaphorical practice in action, and emphasise his personal declination of certain themes of Freud's psychoanalysis through physics, which will prove fundamental for textual interpretation throughout my whole work.

Drunken Boats Sailing the Systemic Chaos

“Quando scriverò la Poetica, dovrà, ognuno che si proponga intenderla, rifarsi dal leggere l'Etica: e anzi la Poetica sarà poco più che un capitolo dell'Etica: e questa deriverà dalla Metafisica” (*SGF* 1:444).⁶ Gadda opened thus his “Meditazione breve circa il dire e il fare” (“Brief Meditation over Saying and Doing”), published in *Letteratura* (“*Literature*”) in 1937 and then collected in *I viaggi la morte* (“*The Voyages the Death*”; 1958). The declaration can be applied to his entire production: to him, philosophical, stylistic, and ethical concerns are indivisible. What he would have defined as his own metaphysics, i.e., his peculiar worldview, is therefore foundational to an informed textual analysis. Gadda's philosophy is almost entirely contained in one work, the *Meditazione milanese*, written in a first form between May the 2nd and June the 28th 1928, then in a second form, although abandoned after only four chapters, between July the 13th and August the 28th. By then, Gadda had passed all his philosophy exams, and interrupted his dissertation on Leibniz's *Nouveaux Essais* at its very beginning, resuming it only a year later yet never concluding it.⁷

I will now define the work's main themes; other issues will be specified when occasion arises. Its main models are Leibniz and Spinoza (along with a series of other lateral influences such as

⁶ “When I write the Poetics, one will have, among those who contemplate to penetrate it, to resort to reading the Ethics: and actually the Poetics will be hardly more than a chapter of the Ethics: and this will derive from the Metaphysics.”

⁷ For the specifics on the writing of the *Meditazione milanese*, see Paola Italia's philological notes in *SVP* 1299-310. For Gadda's philosophy thesis, entitled *La teoria della conoscenza nei «Nuovi saggi» di G. W. Leibniz*, see Gadda (2006b), and in particular Riccardo Stracuzzi's note to the text (39-44).

Bergson, Kant, Heraclitus, Lucretius and Bruno).⁸ Yet, they are declined in a peculiar way that is informed by the scientific spirit of the time. At the centre of Gadda's thought lies the notion of system. Everything, from the smallest element to the entire universe, is to be considered as such. Since the beginning, Gadda indicates the term's analogical nature: "La parola sistema è qui usata nel senso che ha nelle trattazioni meccaniche: 'Sistema = insieme di enti che godono di proprietà comuni': sistema di punti, di rette: sistemi deformabili, sistemi rigidi" (*SVP* 628, n. 1),⁹ later on specifying again that the sense is "fisico matematico" (670, n. 2).¹⁰ System is the (barely) known datum, as is, intuitively, all that lies beyond present knowledge. Gadda's is thus, first and foremost, a philosophy of relation. And such relations, which connect everything logically, epistemically, and ontologically, are continuously changing: any variation leads to a chain-reaction (but here the word chain sounds rather simplistic). Thus, elements within systems are not to be taken in their quiddity, but as "grovigli o nuclei o gomitoli di rapporti privi d'un contorno polito" (633)¹¹ which are in continuous deformation. In other words, Gadda transforms Leibniz's monads into complex and open objects: "La mia monade e il mio io sono delle baracche sconquassate rispetto alle pure sfere d'acciaio di Leibniz e hanno mille finestre e fessure" (832, n.1).¹² Complex, here, should be taken in the sense of hierarchical and multicomponent, dynamical and variable, with uncertain boundaries between its parts. A non-Cartesian framework where, as Gaston Bachelard said of modern science, "[t]here are no simple phenomena: every phenomenon is a fabric of relations" ([1934] 1984, 147).

⁸ References on some of these sources will be found along the way. See nonetheless Guglielmi (1997, 36-38); Lucchini (2000); Porro (2004; on Leibniz); Roscioni (1995, 159-96) – which also includes the interest on modern science, and the economic models of Vilfredo Pareto.

⁹ "The word system is used here in the sense that it has in mechanical treatises: 'System = set of entities which have common properties': system of points, of lines: deformable systems, rigid systems."

¹⁰ "[P]hysico-mathematical." The definition is repeated in the second version of the work: see *SVP* 861, n.1.

¹¹ "[T]angles or nuclei or knots of relationships without a polished contour."

¹² "Compared to Leibniz's pure steel spheres, my monad and my Ego are busted shacks and have a thousand windows and fissures."

The precariousness of such connections, debilitating the very stability of the analysed object up to the notion of substance, is in fact justified with the help of atomic physics: “Nella fisica moderna la sicurezza di un permanere della materia (sostanza fisica) . . . è una certezza. Però lo studio delle sostanze radioattive e considerazioni che qui non intendo richiamare hanno preso a scuoterla o a menomarla” (*SVP* 635-36).¹³ Moreover, as in Valéry, substance itself is not to be considered as inert, either logically or ontologically. Synchronically, the complex ramifications connecting everything to everything lead to what Gadda calls “Teorema della necessità della ricostruzione del coesistente: ‘La considerazione di un oggetto finito costringe la nostra mente a riconoscere l’esistenza di tutto il noto, di tutto il pensabile ed altro ancora’” (646).¹⁴ Importantly, this induces Gadda to extend (self-)consciousness to any possible system (822-27), as each operates in some way on the others and the choice of their borders is in any case arbitrary: “il sistema allaccia, annoda attualmente il reale, e in ciò è coscienza” (827).¹⁵ He arrives at imagining a kind of super-conscience (influenced by Bruno) possessing the (humanly unattainable) knowledge of the entire system, although with a certain irony:

[P]ropenderei . . . per l’idea d’un sistema categorico superumano che non fosse ancora e subito Dio. Ché mi spiacerebbe di spendere Dio per così poco: e cioè di consumare l’Infinito Universo per dar ragione di quattro macachi che impidocchiano la crosta ignominiosa della terra. (706)¹⁶

Diachronically, instead, deformation is interpreted, explicitly through Darwin (884), as a multifarious generation, a trying out of every single possibility. Out of matter comes “molteplicità,”

¹³ “In modern physics the permanence of matter (physical substance) . . . is a certainty. However, the study of radioactive substances and considerations that I do not intend to recall here have started to shake and cripple it.” I would say that those unrecalled considerations include contemporary quantum physics, with its wave-particle duality.

¹⁴ “Theorem of the necessity of the co-existent’s reconstruction: ‘The consideration of a finite object forces our mind to recognise the existence of all the known, all the thinkable and then some.’”

¹⁵ “The system ties, presently knots the real, and in that is conscience.”

¹⁶ “I’d be more inclined towards . . . the idea of a superhuman categorical system that would be not yet, or not right away, God. ‘Cos I’d rather not spend God for so little: that is to consume the Infinite Universe to explain four macaques that infest the ignominious crust of the Earth.’”

thought as “attuantesi a ogni attimo, e germinante come da una continua vibrazione dell’essere” (883).¹⁷ These notions severely hinder the idea of a limited self, destabilising at the same time the distinction between mind and matter, natural and cultural production. Since everything can be seen as a system, and all systems can refer to a conscience and are variously implicated with each other, constantly coming into being anew, even the distinction of subject and object ends up crumbling.

The variability of this systemics leads Gadda to shun any preconceived methodology, adopting an empiricist position that is nonetheless conscious of the historical and theoretical limitation of its basis: “Il terreno del filosofo è . . . la tolda di una nave trascinata dalla tempesta: è il ‘bateau ivre’ delle dissonanze umane, sul cui ponte, non che osservare e riferire, è difficile reggersi” (627-28).¹⁸ Additionally, complex interconnectivity forces him to reconsider the concept of cause-chain, postulating a plurality of causes representable as a “maglia o rete a dimensioni infinite” (650).¹⁹ Refuting the possibility of having a complete knowledge of any system (740-43), Gadda admits that any epistemic operation, bringing new connections to the investigated system, is itself a cause for deformation (668).²⁰ In such predicament, the only ground is what, from the limited range of human perspective, appears to be (temporarily) fixed with respect to the deformation’s flux. This is defined as datum: “Il dato o realtà è una pausa della deformazione in atto” (667).²¹ Any enterprise is thus focused on extending the known relations for a certain object, to find or construct new ones and enlarge the system (again, modifying all relations within it). Gadda names this process “euresi”

¹⁷ “[M]ultiplicity” as “actualising itself at each instant, and germinating from a sort of continuous vibration of being.” On Gadda’s relations to Darwin, with connections to Leibniz and, later on, Freud, see Antonello (2005, 38-51). Roscioni too considers Darwin as interpreted through Leibniz (1995, 38-39).

¹⁸ “The terrain of the philosopher is . . . the deck of a ship dragged by a tempest: it’s the ‘bateau ivre’ of human dissonances, on whose bridge, besides observing and referring, it’s difficult to stand.”

¹⁹ “[I]nfinite-dimensional mail or net.”

²⁰ For the parallels between this notions and quantum physics, see ch. 3.4, 312 ff.

²¹ “The datum or reality is a pause in the ongoing deformation.”

(“heuresis,” from the Greek εὑρεσις, “discovery, invention”)²² and defines it, with mathematical symbolism, as passing from a system n to a system $n+1$.

Not only does the system n , being the known datum, provide resistance to modification, it must also be considered in its temporary factuality, in order to progress. It represents a form of “indugio bruto” (636),²³ which leads to the inevitable imperfection of every project. As an engineer, Gadda explains this by exemplifying the difference between the blueprint and the actual machine (636). Further proof of the equivalence of mental and material, the machine is, for Gadda, a form of heuresis, the materialised solution of “un problema di collegamento logico fra i dati . . . ed i fini . . . e *crea* fra i primi e i secondi un sistema di rapporti” (637-38).²⁴ As Manuela Marchesini argued, “nel suo sistema di riferimento le macchine valgono per quanto, e solo per quanto, sta loro dietro, vale a dire per l'uomo” (1997, 243):²⁵ they are but an extension of human agency, sharing their minds (and body), as natural as anything else.²⁶

Gadda applies heuresis to any kind of progression, be it biological, social, or personal. From an epistemic point of view, this leads to the impermanence of any concept or category. New knowledge

²² See also the glossary term by Paola Italia (1998, 110-11). I use the neologism “heuresis” instead of heuristics to underline both the neologicistic nature of Gadda’s term and the peculiar character of his kind of discovery as tension towards larger systems.

²³ “[B]rute reluctance.”

²⁴ “[A] problem of logical link between data . . . and ends . . . and *creates* between the former and the latter a system of relations.”

²⁵ “[I]n his system of reference machines are worthy for what, and only for what, is behind them, which is the human.”

²⁶ In “L’uomo e la macchina” (“Man and the Machine”), collected in *Gli anni* (“The Years”; 1943), Gadda reiterates that machines “son mere propàggini pragmatifere del sistema pensante «uomo»” (“are mere pragmatiferous appendages of the thinking system ‘man’”; *SGF* 1:257). When it comes to the technician, instead of the designer, he frequently portrays artificial elements as extensions of human limbs. Thus, for example, in “Tecnica e poesia” (“Technology and poetry”), again in *Gli anni*, referring to experienced workers, he describes how “i bicipiti, i fasci muscolari, i flessi dell’avambraccio e della mano e di tutti i diti parevano ultimarsi dentro la virtù dell’utensile: questo si era fatto l’organo di una lor prassi istintiva” (“the biceps, the muscular fasciae, the joints of the forearm and the hand and of all the fingers appeared to terminate inside the virtue of the utensil: the latter had grown into the organ of some instinctual praxis of theirs”; *SVP* 1:246).

is pictured as an infinitesimal increment of an illuminated area, a lamplight gradually increasing its intensity in the darkness of the unknown (700), revealing things, in their new relations, as different than previously believed. Among the samples of epistemic impermanence, it is compelling to note that most reshaped or to-be-reshaped ideas come from the world of physics. Among these are the contrasting interpretations of electricity, stemming from Newton's corpuscular theory (revived in electrodynamics and atomic physics by the discovery of electrons) and Maxwell's field theory (704). They both derive from a lack of knowledge of the total system and have different uses depending on the situation (i.e., the investigated system's artificially imposed borders).²⁷

The relation between datum and progression, being and becoming – themselves creating a system – is considered as a form of polarity between n and $n+1$:

Così la stazione radio di terra, generando oscillazioni elettromagnetiche, lancerà verso la nave messaggi d'amore; ma egualmente la nave, che possiede una sua stazione radio, lancerà verso la terraferma messaggi d'amore. Questa è una ipotiposi analogica e simbolica. Veniamo invece ora ad un esempio. Il fulmine, che sembra scendere dal cielo alla terra, è una violenta scarica elettrostatica a corrente alternata (si ha cioè una inversione di ciclo e polarità elettrica). (808)²⁸

Polarity, in the physical sense of opposition/equilibrium between two forces, was, in fact, a theme that Gadda was reflecting on since his first works. In the 1925 notes titled "Abbozzi di temi per tesi di laurea" ("Sketches of themes for dissertation"), for example, he considered the notion as a starting point for a quite elastic analogical reasoning, to look at the evolution and equilibrium of opposite

²⁷ Electricity is later included among the categories of human understanding, along with others such as cause, but also atom (*SVP* 734-35). Needless to say that categories too are prey to deformation with time.

²⁸ "Thus the radio station on land, generating electromagnetic oscillations, will send love messages to the ship; yet equally the ship, which possesses its own radio station, will send love messages to the mainland. This is an analogical and symbolical hypotyposis. Let us now see an example. Lightning, which seems to descend from the sky to the earth, is a violent AC electrostatic discharge (that is, you have an inversion of cycle and electric polarity)."

instances in history (2006a, 49-57).²⁹ Still lacking the support of his systemics' main elements, the idea ran aground when considered from a diachronic point of view, as it clashed with the principle of cause (how can a polar phenomenon cause its opposite if it needs it to exist?). In the *Meditazione*, once adapted to the systemic interconnection of reality and the concept of heuresis, polarity became a field-like complex equilibrium of attractions in continuous infinitesimal change.³⁰

In ch. 3.4, I will argue that Gadda's notion of polarity and polarisation, in the framework of his philosophy, is robustly in line with (and might partially take inspiration from) Bohr's quantum philosophy of indeterminacy, and produces an aligned worldview in his later works. For now, I would limit myself to the connections to electrodynamics, as the polarity between being and becoming becomes the justification for defining a tension (in the technical sense) between the system n and the system $n+1$, to be taken into account in order to progress. In the *Meditazione*, Gadda described the heuristic stride towards the larger system $n+1$ as a sort of guided progress which, although not assured, still tends to happen due to an internal drive. He defined it as "intimo e schellingiano impulso, con una sua vis genetica" (*SVP* 781)³¹ leading all beings towards an end. He baptised it "sentimento, quello che ci dice per impulso 'sì, no,' 'è bene, è male'" and thus "esprime per un misterioso processo il rapporto essere-divenire" (795).³² Sentiment, connected to happiness (as an indicator of a system's well-functioning), guides towards the optimal progression for which reality imposes minimal resistance. It allows to tap, unconsciously, into the totality of reality's relations, of which it constitutes "il vettore risultante" (799).³³ Importantly for the analogy with electrical tension,

²⁹ The notion had already been applied in his 1924 notes for his first unfinished novel, *Racconto italiano di ignoto del novecento* ("Italian Tale of a Twentieth-Century Unknown"), to the field of ethics, in the form of the necessity of immorality, or of whatever is "ex lege," to sustain morality (*SVP* 407 ff.).

³⁰ For the specifics of the evolution of polarity as a phenomenon from the *Abbozzi* to the *Meditazione*, see Giansiracusa 2019, 39-48.

³¹ "An intimate and Schellingian impulse, with its own genetic *vis* [i.e. strength]."

³² "[S]entiment, that which tells us by impulse 'yes, no,' 'it's good, it's bad'" and thus "expresses by a mysterious process the being-becoming relation."

³³ "[T]he resulting vector."

Gadda defined it in a footnote added to one of his books as “il voltmetro dell’azione” (qtd. in Gadda 1974, 386).³⁴ Sentiment would thus be an intuitive recognition of the system’s mutual polarities, starting from a notion within Schelling’s philosophy³⁵ but gaining momentum through contemporary electromagnetism. This led, in the young and more optimistic Gadda of 1928, to a “fatalismo sì, ma alla rovescia: e cioè tutto avviene per necessità, ma in quanto noi siamo gli attori di questa necessità” (726).³⁶ something internally polarises us in the right direction, even though we are free to dismiss it.

While the notion of sentiment hints at an inherent positivistic pull in Gadda’s philosophy (at least at this stage), it should be noted that it does not prevail in all cases. In fact, Gadda dedicates various pages to the concept of evil, which he considers as the negation of his empiricist rule of thumb. Evil, in fact, is equated with unreality, i.e., with the dissolution of existent systemic links (from n to $n-1$; 758) or with postulation of inexistent systemic links (from $n+1$ back to n ; 763-64). This is, again, interpretable in biological, social, historical, or epistemic terms, and includes following false precepts and *idola mentis* (745). The heuristic progression, though somewhat expected, is neither certain nor linear.

A Spastic Use of Language

As noted, Gadda’s philosophy is thoroughly entangled with his aesthetics and his theory of language. Regarding the latter, Gadda’s heuristic empiricism extends to his ideas on referentiality: the constant deformation of life’s interconnecting systems results in a strong yet peculiar realistic

³⁴ “The voltmeter of action.”

³⁵ Schelling’s natural philosophy, which had at its basis the denial of a separation between the structures of mind and nature, considered nature as spontaneously productive by means of an ascending series of internal polar differences (having the magnet as the model) which prevent the process ever to fall into stasis (See Bowie 1993, 38-41). It seems only natural that Gadda, with his knowledge and interest in electrotechnical engineering, would have picked these notions and updated them through contemporary physics.

³⁶ “[F]atalism, indeed, but backwards: viz., everything happens by necessity, but inasmuch as we are the actors of this necessity.”

tendency. As written by Federico Bertoni, Gadda has “l’esigenza di trasformare il discorso letterario in un referto assolutamente veridico, quasi notarile, capace di aderire con la massima fedeltà a tutto il ribollente spettacolo della vita” (2001, 42-43).³⁷ Multilingualism, dialects, technical or aulic terms, neologisms, and in general macaronic or baroque language: all these linguistic features are to him a resource to express the infinite and interconnected vibrations of being. That is, “[l]a lingua, specchio del totale essere, e del totale pensiero, viene da una cospirazione di forze, intellettive o spontanee, razionali o istintive . . . Non esistono il troppo né il vano, per una lingua” (*SGF* 1:490).³⁸ Among all the possibilities, however, technical and scientific terms result particularly fitting. As he wrote in “Le belle lettere e i contributi espressivi delle tecniche” (“The *Belles Lettres* and the Expressive Contributions of Technologies”; 1929, then in *I viaggi la morte*), technical languages, being carefully elaborated by professional groups and extended from there to the whole society, allow to reach “in corpore veritatis” (i.e., in the very body of truth; 479) as they are directly connected to pragmatic necessities and precise expertise. As the most attuned to the concreteness of reality or the preciseness of definition, they are also, to him, the ones which most closely follow epistemic advancements. Such process, ideally, should be characteristic of language in general, as “il compito del disintegrare e del ricostruire l’espressione emana dalla funzione stessa della conoscenza: è euresi, è attività connaturata alla costruzione gnoseologica” (487).³⁹

If, for Valéry, scientific and mathematical language was to be preferred, at least in the beginning, as the most conscious of its own artificiality, in the hope of an *arithmetica universalis*, Gadda, coming from a later generation, applies right away his own realistic point of view to a strongly referential semantics. He stresses, at the same time, the modifications apported by linguistic evolution: instead

³⁷ “[T]he necessity to transform literary discourse in an absolutely veridic, almost notarial, report, one able to adhere with maximal fidelity to life’s whole bubbling spectacle.”

³⁸ “Language, mirror of the total being, and of the total thinking, comes from a conspiracy of forces, intellectual and spontaneous, rational and instinctive . . . there is neither excess nor sham, for a language.”

³⁹ “[T]he task of disintegrating and reconstructing expression emanates from the very function of knowledge: it is heuresis, it is an activity innate in epistemic construction.”

of rejecting common language for its imprecision, he reaffirms the importance of every semantic shade for expressing a particular side of reality, yet considers technical language as an optimum. He also has no problem with the fact that, as he writes in the *Meditazione*, “[l]a parola di oggi non è l’ultima, è una pausa o grado della conoscenza . . . semplicemente ‘la situazione del giorno’” (*SVP* 702),⁴⁰ and that linguistic reshaping includes scientific language, as a tool that needs to be adapted to every new epistemic turn.⁴¹

The scientific framework of Gadda and Valéry’s ideas on representation leads to a shared spite for non-referentiality. Gadda shaped it in the form of social and ethical preoccupations. As Antonello wrote, “la maccheronea . . . agisce contro l’abuso dei moduli, delle frasi e dei ragionamenti stereotipati” (2005, 37):⁴² it serves the need of contrasting false expressions and void rhetoric which, if taken for granted, thwarts reality and leads to evil in the systemic sense – the breaking of a true connection, or the positing of an inexistent one. Writing his “Meditazione breve” in a prose filled with references to Galilei’s dialogue,⁴³ Gadda reaffirmed the ontic power of language, “il suo contenuto magico” (*SVP* 1:453),⁴⁴ echoing the tenets of his previous *Meditazione milanese*: “il vaniloquio ingenera la non-vita, in chi vi si presta, cioè l’errore e la tenebra” (*SGF* 1:449).⁴⁵ In other words, language, when misused, is equivalent to preconceived methods that do not take into account reality’s unrestful character, simplifying what is changing and complex, and reaffirming an inexistent

⁴⁰ “[T]oday’s word is not the last, it is a pause or grade of knowledge . . . simply ‘the situation of the day’.”

⁴¹ Apart from what has been already said of the deformation of scientific concepts described in the *Meditazione*, I could quote a much older sample from 1956. In the educational article “Alessandro Volta e il metano” (“Alessandro Volta and Methane”), reconstructing the research of the Italian scientist on the gas from a series of letters, Gadda connected Volta’s theoretical mistakes on the matter with the imprecise terminology of the time (the consideration, that is, of methane as a kind of air). He affirmed: “È legge pressoché generale, nel meccanismo della conoscenza, che un errore di linguaggio, in quanto errore di rappresentazione, induca in altre rappresentazioni «sbagliate», in altri abbagli, in ulteriori stravaganze” (“It is almost a general law, in the mechanism of knowledge, that a mistake in language, being a mistake in representation, would induce in other ‘wrong’ representations, in other blunders, in further extravagances.”; *SVP* 201).

⁴² “Macaronic . . . acts against the abuse of stereotypical modules, phrases and reasonings.”

⁴³ On Gadda and Galilei, with an eye on some parallels with Feyerabend’s anti-positivism, see Porro (2008).

⁴⁴ “[I]ts magic content.”

⁴⁵ “[B]aldersdash generates non-life, in those who engage in it, that is error and darkness.”

power of the subject over its object. Macaronic and baroque multilingual experimentalism becomes an antidote to such practices, mimicking the multidirectional evolution of the world and adopting, as Segre wrote (1994, 90-91) the *Meditazione*'s belief that knowing is deforming.

In this way, language becomes not only a tool but an active participant in heuresis. Spurring any distinction between subject and object or mental and material, language contributes to reality's deformation and to the enterprise towards a system $n+1$. The article in which Gadda's linguistic epistemics is best exemplified is his 1950 "Come lavoro" ("How I work"; collected in *I viaggi la morte*, where it is dated 1949). There, Gadda dedicates several pages to demolishing the D'Annunzio-inspired model of the writer as "vate," or prophet – and its political parallel, Mussolini – guiding the people through idealistic (viz. void) and pretentious rhetoric. He then proposes baroque style (which, by then, characterised his prose for the public) as a reaction to the "ambianza bugiarda" (*SGF* 1:435)⁴⁶ and reiterates the historically compromised character of language: "La parola convocata sotto penna non è vergine mai" (436).⁴⁷ This leads him to declare the means of his linguistic heuresis. If words are "momenti-pause . . . d'una fluenza (o d'una ascensione) conoscitiva-espressiva," which change as history changes, cumulating meaning over meaning, the only choices of the writer are either to "rivivere *parodisticamente*" a meaning which does not correspond to reality anymore, or to utilise the word in a new sense (437).⁴⁸ Here lies the effect of deformation:

La frase e il vocabolo, sotto più esperta mano e più sottilmente operante, si spogliano delle tonalità loro parodistiche: venute in carta al cri-cri lieve della penna, si libera, ognuna, a un tono novo, a un timbro perverso. Si demanda loro novo incarico. La nova utilizzazione le strazia: la lor figura si deforma, comparativamente all'usato, come d'un elastico teso . . . lo «spasmo», «l'impiego spastico», può comportare una dissoluzione-rinnovazione del valore. (437)⁴⁹

⁴⁶ "[D]eceitful ambience."

⁴⁷ "Never is the word summoned under the pen virgin."

⁴⁸ "[M]oments-pauses of a cognitive-expressive fluency"; "live again *parodically*."

⁴⁹ "The phrase and the term, under a more expert and more subtly operating hand, undress of their parodic tonalities: come into paper with the soft cri-cri of the pen, it frees itself, each one of them, to a new tone, to a perverse timbre. They

Gadda's "spastic" use of language translates into a creative tendency that sets words ablaze in new combinations: an intersection of semantic fields through new syntactic relations. The best operators for such process are analogical reasoning and metaphors. It is the same kind of disciplinary crossing that informed the reasoning of the *Meditazione milanese*, which reworked scientific concepts into a philosophical framework.

When applied to literature, such move instantiates the tension between the resistance of the system n and the call of the system $n+1$. As Andrea Battistini wrote, when used metaphorically "il termine proprio non viene affatto sostituito ma convive proponendo soluzioni multiple" (2006, 20).⁵⁰ That is, the word is torn between the frame of its vehicle and that of its tenor. In this sense, if we accept Gadda's referential urgency, then his heuristic language must be taken as an *in fieri* process that, like Valéry's and Woolf's case, involves the readers, calling for their critical attention in an active perspective-taking (or imagination), to reach the yet undefined sense through a wider semantic organisation. Aimed at a larger system, metaphors in Gadda tend to call for other metaphors, recruiting the lexicon of different fields of knowledge (of which physics is but an example) and linguistic varieties that are spread throughout the text in order to maintain a sort of semantic fluidity around their objects, without reaching a right-away definitive answer.

Most of all, given Gadda's theorem of the necessity of the coexistent, the vertical relations of similarity called for by the metaphorical process turn out to be horizontal. That is, once the system $n+1$ is instantiated, the links between its objects have to be taken as actual connections, spreading across both the diachronic and the synchronic axes. Such character has been thoroughly studied, and seems to define Gadda's prose in all its discursive elements. Gian Carlo Roscioni has first indicated Gadda's tendency towards endless metonymy as epistemic necessity (1995, 8). Starting from this

are demanded a new office. Their new use lacerates them, their figure is deformed, in comparison to the usual, like an overstretched rubber band . . . the 'spasm,' the 'spastic use,' can entail a dissolution-renovation of the value."

⁵⁰ "The proper term is not at all substituted, but coexists while proposing multiple solutions."

Gaddian “kaleidoscope,” Emilio Manzotti, mainly from a syntactical point of view, has found two main types of description in Gadda’s prose, which he defined as “by alternatives” and “with comment.” The first type is a cumulation of descriptions around the same object, generating “variants, situations, and manifestations complementary to each other” (1997, 63); the second develops “non-homogeneous layers with respect to the textual type or level” (63) by means of multiple and at times cumulative digressions.

Based on Manzotti’s analysis, Inge Poelemans has stated that in Gadda’s prose “metonimia, metafora, iperbole e parodia sono concetti non distinguibili l’uno dall’altro” (2012, 55)⁵¹ as they participate in the same connective frenzy. What metaphors and analogies do best, however – as we will see soon and throughout this work – is inviting interdisciplinary connections: they are thus a tool for including scientific theories and models within the system of the narrated objects, and, as such, they allow to include the object within larger structured organisations. Moreover, in their research for the right match that might show the larger implication of their primary subject, metaphors and metonymies contribute to the direct and indirect visualisation of the represented quid, playing a role that is similar to another typically Gaddian figure: hypotyposis. As explained by Martha Kleinhans, “l’iconicità ha per [Gadda] una funzione epistemologica; la predominanza dell’immagine, nella sua scrittura scaturisce dal dubbio gnoseologico” (2004).⁵²

Before moving to the scientific metaphors in *Eros e Priapo*, it should be noted that Gadda’s metonymic tendency has also been interpreted as a way of retracting into purely subjective expression, reducing the object to a collateral element. From a psychoanalytic perspective, Robert Dombroski sees Gadda’s baroque not as an ontological affirmation of reality’s character, but as a “schizophrenic” relation in which the narrating instance envelops the object “in the constant flux of his moods and impulses” (1997, 54). As such, to Dombroski, the narrating psyche is “not made to

⁵¹ “Metonymy, metaphor, hyperbole and parody are concepts that cannot be distinguished from one another.”

⁵² “Iconicity has for [Gadda] an epistemological function; the predominance of the image, in his writing, sparks from epistemic doubt.”

exemplify in the least an indeterminate project of meaning production” but reduces the world to “one infinitely communicable experience . . . of ‘wordless pain within the monad’” (58).

Riccardo Stracuzzi, starting from a similar basis, has proposed to reduce Gadda’s true epistemic stride to one directed towards the subject, not as the actual person but as “soggetto nel linguaggio, che in letteratura equivale a un sigillo autoriale adibito alla riduzione dei *disiecta* di ogni testo entro l’unità dello stile” (2007).⁵³ That is, Gadda’s macrotext would have to be collapsed onto the repeated expression/analysis of the tragic subject’s looking at himself through the mirror of its discourse, *whatever its object*. Against such readings, it should be remembered that the inevitable and complex implication of the subject within the object and vice versa – thus of the mental and the material – was, as we have seen, part of the contemporary scientific framework,⁵⁴ and Gadda recognised this and extended it to all epistemic frameworks since the *Meditazione*. Finding insight on the subject within the chaotic relations of the external system, in this sense, is an inevitable consequence which does not reflect a lack of interest for the latter, even without the hope of achieving any definitive notion of it. Taking all this into account, the notorious difficulty of Gadda’s language reflects not a stylistic elitism or a defence mechanism, but a will to carefully portray every object in its relational essence. This translates into a resulting imaginary that mixes technical precision and semantic expressionism as part of the epistemic enterprise of systemic representation.

Eros e Priapo: Antifascist Misogyny.

Eros e Priapo was written between 1944 and 1945, in the context of the general editorial fervour of a Rome recently liberated by the Allied forces. However, the complete text never saw the light of

⁵³ “[S]ubject in the language, which in literature amounts to an authorial seal assigned to the reduction of the *disiecta* (i.e., the dispersed elements) of each text within the unity of the style.”

⁵⁴ But see also the following sections, ch. 2.4 and 3.4, where, apart from the mind-body dualism, the question of subject and object in Gadda is more directly considered.

publication until 1967 and, even then, only in a heavily modified and self-censored form, rewritten with the external help of Enzo Siciliano for the editor Garzanti. I will analyse the original version, which was only found in 2010 and published in 2016.⁵⁵ The reason for the late and mangled publication is the explosive obscenity of the work. Antifascist pamphlet written in a poisonous satirical style through a linguistic pastiche including popular Florentin, technical and aulic language, mock fascist lingo, and the crudest possible contumely, *Eros e Priapo* embarks on an analysis of twenty years of dictatorship through the lens of Freudian theory. Its objective is exposing the unconscious sexual drives, the “secrete vie della libidine” (2016, 24),⁵⁶ that led to its rise and fall, in order to avoid its future repetition. If Gadda, in a 1963 interview by Alberto Arbasino, declared that his interest in psychoanalysis started in 1926 (Gadda 1993, 93), critics have set the bulk of his readings, and most of all their assimilation, between the second half of the ‘30s and the ‘50s – the first Freudian piece being the short essay “Una tigre al parco” (“A Tiger at the Park”) from 1936 – and particularly in the period of *Eros e Priapo*.⁵⁷

⁵⁵ For the history of the work, see the editorial note by Paola Italia and Giorgio Pinotti in Gadda (2016, 345-451). Sections of the text, as usual in Gadda’s case, were fed to the writing and/or publication of other pieces. The third chapter of the original version was published in an increased but substantially faithful form in 1955 in *Officina* as “Il libro delle furie” (“The Book of the Furies”). Other parts were also used in “I miti del somaro” (“The Myths of the Ass”; first published posthumously in 1988) and in various other published and unpublished essays.

⁵⁶ “[S]ecret [but with a pun with secrete] ways of libido.”

⁵⁷ See Amigoni (1995, 11-13); Lucchini (1997, 177-78); Borali (2016, 39-41); and Italia and Pinotti in the editorial note (Gadda 2016, 383). Gadda possessed various essays and collections by Freud. Among them *Il disagio della civiltà* (“*Civilisation and Its Discontents*”; not dated); *Totem e tabù* (“*Totem and Taboo*”) in the 1946 translation by Edoardo Weiss; *Nuovi saggi di psicoanalisi. Al di là del principio del piacere. Psicologia delle masse e analisi dell’io. Rivelazione dell’inconscio: l’Io e l’Es* (“*New Essays on Psychoanalysis. Beyond the Pleasure Principle. Group Psychology and the Analysis of the Ego. Revelation of the Unconscious: The Ego and the Id*; 1947). Additionally, he possessed various French translations by Samuel Jankélévitch: *Essais de psychanalyse* (“*Essays on Psychoanalysis*”; 1929, but dated “1942” by Gadda on the first page); *Essais de psychanalyse appliquée* (“*Essays on Applied Psychoanalysis*”; 1933); *Introduction à la psychanalyse* (“*Introduction to Psychoanalysis*”; 1929); and *La psychopathologie de la vie quotidienne. Application de la psychanalyse à l’interprétation de ses actes* (“*The Psychopathology of Everyday Life: Application of Psychoanalysis to the Interpretation of Its Acts*”; 1926).

While Gadda’s copy of *Totem and Taboo* is dated 1946, the mentioning of it in his notes for *Eros e Priapo* (Gadda 2016, 231) and its punctual use reveals that he had already read the book before 1944. On this, see Borali (2016).

Some specifications are in order. The work crosses various genre boundaries, being a hybrid creature that shares characteristics with satire, treatise, and memoir. It does not constitute a fictional world properly, even though, following Marie-Laure Ryan's recent classification (2019, 63), it could be considered as an (unorthodox) non-fictional storyworld. Nonetheless, as Paolo Gervasi wrote, "la mancanza di controllo, la formalizzazione incompiuta e aperta, sembra fare luce su una zona profonda, originaria, della creatività di Gadda, evidenziando un rapporto ravvicinato tra la genesi dei fenomeni dello stile e la pressione che i fatti storici esercitano sulla psiche" (2016, 4).⁵⁸ In this sense, I have chosen to focus on this work as it is probably the most explicit example of Gadda's use of analogical reasoning and analogical-metaphorical expression merging physics (as one of Gadda's privileged analytical frameworks) with other theories. Moreover, its specific interaction between physics and Freudian psychology gives a model of the ego that will prove fundamental for all following textual analysis.

Gadda's extreme form of antifascism derives from a past involvement with, or at least adherence to, the regime, as he affiliated with the party since 1921. Although critics tend to disagree on when exactly Gadda developed his disillusion and repulsion for the regime,⁵⁹ it is generally concurred that

⁵⁸ "[T]he lack of control, the open and incomplete formalisation, seems to shed light on a deep, original region of Gadda's creativity, underlining a close relationship between the genesis of stylistic phenomena and the pressure that historical facts exert on the psyche."

⁵⁹ In 1968, Gadda declared to Dacia Maraini that he got to understand the dangers of fascism only in 1934, and that before he never cared for it. To this at the very least dubious affirmation, he added the blatant lie of having written *Eros e Priapo* already in 1928 (1993, 168). In fact, Gadda expressed an explicit (although possibly only formal) approbation of the regime's policy in quite a few of his technical divulgations even after the start of the war. The debate over Gadda's more or less convinced fascism thus orbits around the effective value of these works. At the extreme poles of the discussion, we find Peter Hainsworth (2003), for whom Gadda only realised his mistake in 1943, and generally maintained his previous ideas (which were rather unorthodox with respect to the regime's policy) with the exception of the acceptance of fascist rhetoric; and Aldo Pecoraro ([2002] 2019) who considers Gadda as antifascist already by the mid-twenties. Dombroski (2003) tends to agree with Hainsworth and sees *Eros e Priapo* (in the 1967 form) as a reaction from a conservative and solidly right-wing position. Raffaele Donnarumma (2002) puts the beginning of an active refusal in 1943, but notes that his opposition is clear at least since the writing of *La Cognizione del dolore* ("The Experience of Pain") in 1936, not as a political statement proper, but as the expression of "il disagio di un reazionario" ("the discomfort of a reactionary").

the latter is genuine. The original version of the pamphlet highlights its character as both denounce and self-denounce, as Italia and Pinotti have argued (Gadda 2016, 371-76). However, antifascist opposition is entangled with a fierce misogynistic perspective. Freudian theory is taken up in its analysis of libido, or eros, and its value at all social levels. In Gadda's view, this is indispensable for a true analysis of historical phenomenon. He affirms: "Eros è alle radici della vita e della personalità individua, come dell'istinto e della pragmatica d'ogni socialità e d'ogni associazione di fatto, d'ogni fenomeno collettivo" (28).⁶⁰ After such declaration, however, the second chapter, the longest of the work, centres on the use made by the hyper-narcissistic Mussolini of women as an "instrumentum regni" (41) – in Machiavellian terms – through their sexual impulses. By posing himself as "mastio de' mastii" (45),⁶¹ "eponimo della Patria" (48),⁶² "Io-fallo" (49)⁶³ and "detentore de i' barile unico e centrale dello sperma" (56),⁶⁴ the "kuce" (slurring of *duce* throughout the whole text) managed to obtain the adoration of Italian women, and through them of their male partners. Gadda takes the idea of a female receptive tendency opposed to a male constructive one to be "opinione corrente de' fisici, de' biologi" (48).⁶⁵ He distinguishes two biological impulses, split between female preservation/matter and male exploration/form, enacting a gendered version of what was in the

On the other side, Giuseppe Stellardi (2003) downplays the superficial rhetoric of Gadda's propagandistic bits as the attempts of a "povero diavolo" ("poor devil") to make a living with his writing in a condition of constant indigence, and reaffirms the "nessunissima conseguenza politica" ("absolute lack of political consequences") of that production; Italia and Pinotti (Gadda 2016, 372-74), too, underline the ambiguity of Gadda's relationship with the party. Stracuzzi (2007), following Manuela Bertone's introduction to Gadda's most propagandistic divulgations (Gadda 2005, 34), refuses to consider these works as a smoking gun for Gadda's hypothetically convinced fascism. Inge Poelemans (2012), as a final sample, insists on the importance of the Gaddian parodical or serious use of metaphors typical of fascist rhetoric (especially those connected with virility) and of literary style in general, as a way of solving the question, but refrains from a clear-cut standpoint on the matter.

⁶⁰ "Eros is at the roots of life and of the individual person, as well as of the instinct and of the pragmatics of every sociality and actual association, of every collective phenomenon."

⁶¹ "[M]an among all men."

⁶² "[E]ponym for the Motherland."

⁶³ "I-fallus." The expression connects Gadda's ideas on the I with Woolf's: see ch. 1.3, 92 ff.

⁶⁴ "Holder of the sole and central barrel of the sperm."

⁶⁵ "Current opinion of the physicists, of the biologists."

Meditazione the polar tension between the system n and the system $n+1$: “Il mastio è l’elemento euristico della specie, la femmina l’elemento cicatrizzante” (48).⁶⁶ On this base, the female “natural” tendency to uncreatively repeat both justifies female’s attraction and weakness to Mussolini’s narcissistic tendencies, and undermines as disastrous what Gadda sees as a female-centred state policy.

Recent studies have considered Gadda’s misogyny in its historical context, relating it not only to the environment of the turn-of-the-century positivistic Milan, but also to the contemporary influence of Otto Weininger’s *Sex and Character* (1903; see Amberson 2012, 127-30), which proposed a very similar distinction between male and female traits.⁶⁷ Importantly, starting from the work of Rodica Diaconescu-Blumenfeld (1999), many have also noted that Gadda’s use of gender categories is rather fluid. As highlighted by Manuela Marchesini (2014, 33-42), the latter are entangled, since at least the 1924 notes to *Racconto italiano di ignoto del novecento* (“*Italian Tale of a Twentieth-Century Unknown*”), to his idea of polarity. Gender in Gadda seems to change along with the subject-object relation: “Forse a noi appare di essere solamente maschi, ma in realtà, nei misteriosi fondi della natura, siamo semplicemente dei «polarizzati» e «potenzialmente» possiamo essere l’uno e l’altro” (*SVP* 463).⁶⁸ Marchesini defines this concept “onnipotenzialità” (“omnipotentiality”). In this sense, polarity and gender were already linked in the natural philosophy of Schelling,⁶⁹ whom Gadda had quoted as an inspiration for sentiment in the *Meditazione*. We can add the research of Deborah Amberson: “Gadda’s deployment of the categories of male and female veils a subject/object divide that opposes subjective agency to an objectified and moulded materiality” (2012, 133).

⁶⁶ “The man is the species’ heuristic element, the woman the cicatrising one.”

⁶⁷ To the philosophical and pseudoscientific theories, we should add Gadda’s reverence to certain stylistic models, including Machiavelli, Aretino, John’s *Apocalypse*, as well as the Latin comic-satirical veins, from Plautus to Terentius, from Tacitus to Suetonius (see the editorial note in Gadda 2016, 408) and, I would add, Juvenal.

⁶⁸ “Maybe it appears to us that we are only male, but in fact, in the mysterious groundworks of nature, we are simply ‘polarised’ and ‘potentially’ we can be one and the other.”

⁶⁹ Schelling’s natural polarity is undeniably connected to gender, but the results of his theory tend to be a little ambiguous and change with time. See the work of Alison Stone (2020).

Amberson's focus on embodiment reveals that Gadda's use of the female category is reserved for those bodies that are victims of societal control and alteration, be them organically male or female. *Eros e Priapo* is not an exception in this sense, as written by Alessandra Di Tella: "[N]ella sostanza, il trattamento riservato ai due sessi non risulta poi così dissimile, muovendo dalle medesime premesse teoriche e dalle stesse accuse di narcisismo non sublimato" (2017, 17).⁷⁰ Gadda invariantly describes the masses receiving the word of the "kuce" as female, and has no problem in saying that "anche gli uomini hanno un utero e un ovaio, più uterino e più ovarico di quello delle donne" (2016, 119-20),⁷¹ meaning with this a certain psychological receptivity to "male" influence.

It must also be noted that Gadda was, in all probability, homosexual,⁷² living in a dictatorship that not only considered it as a deviation and a crime, but also promoted reproduction as a duty while chastising celibacy both socially and practically:⁷³ "Lui [Mussolini] voleva gli facessero i figli, lui dimandava la Italia la rifigliasse otto in otto come la conigliera o i' maialaio, da ne cavar figli, figli figli da mandare a la guerra, guerra, guerra" (66).⁷⁴ Condemned to a repressed sexuality while having his masculinity undermined (after having fought in World War I and having lost his brother in it), Gadda lashes out against the fascist procreative policy, depicting a society in which, as a result of an incessant propaganda proposing the dictator as a sex symbol, women (or the "Marie Luise," as he dubs them) are having sex with Mussolini *in absentia* through their own husbands, therefore reduced

⁷⁰ "In the matter of facts, the treatment reserved to the two sexes is not so different, as it moves from the same theoretical premises and the same accusations of non-sublimated narcissism."

⁷¹ "Men too have a uterus and an ovary, more uterine and more ovarian than the women's one."

⁷² To Andrea Cortellessa, the original version of *Eros e Priapo* is the work where Gadda "si spinge più vicino al *coming out* . . . relativo alla propria omosessualità" ("goes closest to the *coming out* . . . relative to his homosexuality; 2017, 60). On the various hints of Gadda's homosexuality in general, see Gioanola (2004, 221-36).

⁷³ A tax on celibacy was decreed in 1926 and put effectively into force since February the 13th 1927. Notably, the story of *Quer pasticciaccio brutto de via Merulana* ("That Awful Mess on the Via Merulana; 1957) starts exactly a week later, and Gadda himself appears in a cameo as a very probably (though not explicitly) homosexual bachelor.

⁷⁴ "He [Mussolini] wanted sons made for him, he asked Italy to breed eight by eight like the rabbit-seller and the pig-seller, to bunch up sons, sons, sons to send to the war, war, war."

to subordinate sexual props (see also Di Tella 2016, 14).⁷⁵ He arrives at the point of declaring the actual genderised control imposed on women, the “vinculi oppressivi che legano nostre donne a la conocchia uggiosa de’ doveri loro . . . alleviandone o liberandone noi, da que’ sudici e baronfottuti che siamo in nel nostro mascolino egoismo e infinita vanità di dindonpavoni da ruota tirata” (2016, 91),⁷⁶ only to use it to propose an unconscious female desire for war as possible sexual liberation (91-98). It seems that, apart from being a form of violent exorcism against the past political submission or inaction (as per Dombroski 2003), *Eros e Priapo* takes also the form of a misplaced accusation against an oppressive sexual policy that, in the social and personal impossibility of declaring one’s own (in the view of the time) deviance, can only be expressed through a phallogocentric, if tormented, perspective.⁷⁷ In a sense, Gadda falls (for real, in this particular case) for the mistake that he himself frequently called attention to: failing to see, or to admit, the implication of the subject within the object of analysis that makes of them a single system.

The Third Chapter: Energetic Libido

Having dispatched the most problematic part of the text, we can now turn to the third chapter. Here, leaving aside (at least in part) the most virulent tones of the invective, Gadda tries to face the question of libido and its narcissistic expression from a more technical point of view. It is soon clear that Gadda’s Freudian terminology is entangled with physics, the prevalent among other fields. Libido

⁷⁵ On Mussolini’s propaganda in this sense, its actual results and its literary representation, see Sica (2018). Following the reconstruction of Italia and Pinotti (Gadda 2016, 385-89), it also seems that Gadda had in mind some actual specific counterparts behind the “Marie Luise,” which explains why he systematically changed the reference in the 1967 edition.

⁷⁶ “[O]ppressive bonds tying our women to the tedious distaff of their duties . . . alleviating or freeing us of them, as nothing but filthy and fucked-up-barons that we are in our masculine egoism and infinite vanity of tail-spreading turkey-peacocks.”

⁷⁷ It is not a case that some references to Gadda’s homosexuality are removed in the 1967 publication. See the editorial note of the latter edition by Giorgio Pinotti in *SGF* 1:1010-11.

is interpreted through electromagnetism, and its narcissistic expression is soon rebaptised “carica narcissica” which, “conferita dal meccanismo naturale biogenetico,” acquires its “maggiore intensità” by the age of twenty and, in the normal development, changes in quality through “sublimazione” (2016, 138).⁷⁸ The term “carica” had been used before (e.g. 68, 123), but only here does it receive systematic attention. Right before deploying it, Gadda prepares the terrain through a sustained metaphor comparing society to an electric circuit, which ends up short-circuiting because of the high intensity of the narcissistic electric current running through it (as people are put in positions of power not through merit but through adulation):

La «tensione spirituale» della collettività subisce in questi corti-circuiti una repentina caduta. L’«energia attuale» (cioè il lavoro) della collettività subisce in essi una ingente dissipazione: talora una dissipazione verso terra, cioè verso il nulla. In genere: la tensione morale della collettività si annienta in un verbiloquio seguito da furto, l’energia storica della collettività si spappola in un auto-stupro (onanismo). (138)⁷⁹

Gadda’s narcissism, like Woolf’s, leads to energetic waste, yet Gadda is (in general) more interested in the larger social effects of such waste than in the specificity of binary relations (which was the case for Mr. and Mrs. Ramsay, though requiring a third party, James, to appreciate the event: see ch. 1.3, 91). Gadda’s electrodynamical metaphor was preceded by one linked to genetics (society as an egg cell: 138) and is soon paired with another analogy: that between the Ego and a planetary mass, which maintains its unity through gravitational pull, represented by self-love, i.e., libido in narcissistic form. Gadda had since the beginning considered self-love as foundational to the human self, and now reiterates: “L’autolubido esprime la necessaria coesione dell’Io, ed è per il singolo

⁷⁸ “[N]arcissistic charge”; “conferred by the natural biogenetic mechanism”; “major intensity”; “sublimation.”

⁷⁹ “The ‘spiritual voltage’ of the community encounters, in such short-circuits, a sudden fall. The ‘actual energy’ (that is, the work) of the community is subject to a tremendous dissipation: ever so often a dissipation to the ground, thus to nothing. Generally speaking: the moral voltage of the community is annihilated in a verbosity followed by theft, the historical energy of the community is squashed in a self-rape (onanism).”

organismo quello che è la forza centripeta o gravitazione per il singolo pianeta” (139).⁸⁰ This leads him to imagine certain psychopathologies as abnormal changes in the pull of internal forces: while in schizophrenia, due to a dissolution of the Ego’s unity, “l’Io va a pezzi come uno specchio infranto, come un ammasso planetario privo di coesione gravitazionale” (139-40),⁸¹ the pathological narcissist “dobbiamo pensarlo come un pianeta la di cui materia la si staccia e si annichila in un campo centripeto stritolatore, in una ipergravitazione o iper-campo centripeto” (141).^{82,83} It should be noted that, while the more straightforward notions of narcissistic charge and societal circuit are introduced right away as metaphors, the more complex idea of the ego as a planet is initially deployed as an expository analogical argument. The exhortation to the reader’s imagination (“dobbiamo pensarlo”) partakes of the typical linguistic modules of thought experiments, while focusing on the pictorial, concrete side of the explanation. Once implemented, both models call forth further metaphorical expressions – such as “polarizzazione sessuale” and “Io potentemente centripeto” (150),⁸⁴ to name a couple – that help defining the internal and external dynamics of libido.

Paola Italia (2016, 148-55) has already quoted these and other passages as samples of Gadda’s scientific metaphors, noting their argumentative power: for example, the society-as-circuit metaphor leads to considerations of morality that are strengthened by the pragmatic urgency of society’s good functioning (152). Italia has concluded that *Eros e Priapo*, especially in the third and fourth chapters,

⁸⁰ “Self-libido expresses the necessary cohesion of the ego, and is for the single organism what centripetal force or gravitation is for the single planet.”

⁸¹ “[T]he Ego goes to pieces like a shattered mirror, like a planetary cluster devoid of gravitational cohesion.”

⁸² “[W]e must think about it as a planet whose matter gets squashed and annihilated in a centripetal grinding field, in a hyper-gravitation or centripetal hyper-field.”

⁸³ The terminology is later repeated in the essay “L’egoista” (“The Egoist”; 1954 then in *I viaggi la morte*), where the character of the egoist (here distinguished from the narcissist, like Freud does repeatedly, e.g. in his “The Libido Theory and Narcissism”: see [1917] 1963, 412) is described with the typical modes of scientific exposition: “Immaginiamo un pianeta dove il valore della gravità fosse duemila volte quello del campo gravidico terrestre” (“Let us imagine a planet where the value of gravity were two thousand times that of the Earth’s gravitational field”; *SGF* 1:659). Narcissism, too, is explained through the metaphor of the “carica narcissica” (“narcissistic charge”; 664).

⁸⁴ “[S]exual polarisation”; “strongly centripetal ego.”

can be considered as “il secondo libro, dopo la *Meditazione Milanese*, di una sua [di Gadda] eterodossa filosofia” (155).⁸⁵ Following her suggestion, I would argue that these models, once applied to Freudian psychoanalysis, allow Gadda to assimilate its concepts into the analogical texture of his *Meditazione*, where the relations between systems were described in terms of electric polarity and other physical models. Moreover, Gadda’s energetic view of the ego allows him to showcase the latter’s structural characters in a way that unifies mental and physical phenomena, inserting both in a larger context/system while making them systematically more visualisable. That is, it reaches Valéry’s and Woolf’s same result, but with a different theoretical basis behind (Freud). In addition, the references to gravitational and electric phenomena directly call upon physical field models which, within the contemporary atomistic and electromagnetic theories, extend the mutual influence of their objects beyond their material borders, providing a formal explanation for interpersonal relationships and the role of libido in the society at large (especially in the deviant form of Mussolini’s hyper-narcissism).

As Valentino Baldi wrote, the probable influence on the *Meditazione* of nineteenth-century psychophysics and psychophysiology – in particular Gustav Fechner and Théodule-Armand Ribot – could be used to better understand “cosa, di Freud, potesse interessare a Gadda” (2019, 37).⁸⁶ And, indeed, Freud himself was no stranger to quantitative interpretations and analogies with contemporary physics. We have seen both Serres’ thermodynamical interpretation, and the very libido theory’s formal character which Andrea Pasquino put in close contact with Valéry’s own theory of the *esprit* (see ch. 1.2, 60-61). In Gadda’s case, the work to consult is Freud’s *Group Psychology and the Analysis of the Ego*, contained in the French-translated collection *Essais de psychanalyse* that he possessed since 1942. The importance of this work for *Eros e Priapo* has been highlighted by all critics working on the pamphlet (see n. 57 in this chapter). Along with the (undoubtedly influential) specifics of crowd psychology, I would, however, point out the importance of Freud’s foundational

⁸⁵ “[T]he second book, after the *Meditazione milanese*, of a heterodox philosophy of his [Gadda’s].”

⁸⁶ “[W]hat, of Freud’s work, could interest Gadda.”

definition of libido which, I believe, is at the base of the paramount role that the notion plays in Gadda's own philosophy. To Freud, libido is "the energy, regarded as a quantitative magnitude (though not at present actually measurable), of those instincts which have to do with all that may be comprised under the word 'love'" ([1921] 1955, 90). It is such energetic foundations of Freud's theory,⁸⁷ and the connection drawn between mental phenomena and physical entities, that made the theory aligned with, and thus easily assimilable by, Gadda's own systemics. By the way, Freud probably profited from Le Bon's own interpretation of the electromagnetic-like influence of ideas in what he called the "mental contagion" in crowds, which was itself part of a larger nineteenth-century electromagnetic framework (see K. Murphy 2020, 129-31). He dedicated various pages describing Le Bon's theories in his own *Group Psychology*.

The importance given by Gadda to this analogical model cannot be overestimated. In the notes titled "Schema del capitolo II" ("Outline of Chapter II"), containing themes that he will in fact develop mostly in the third chapter, he went as far as drawing tables to sustain a by-and-large quantitative reasoning, such as the one describing the kinds of erotic charge in the average male:

Carica erotica totale: 100

= Erotia narcissica sublimata o no:	20.
= Erotia eterosessuale normale sublimata o no:	45.
= Erotia omosessuale normale per lo più latente o sublimata o almeno déguisée (défroquée en gloire):	5.
= Erotia sociale sublimata o no:	20.
= Erotia idolatrante scarsamente sublimata ivi compresa l'erotia totemica:	10.

⁸⁷ The investment (or cathexis, germ. *Besetzung*) of energetic libido takes up declared electric character in previous works of Freud. In "The Neuro-Psychoses of Defence," for example, it is defined as "a quota of affect or sum of excitation – which possesses all the characteristics of a quantity (though we have no means of measuring it), which is capable of increase, diminution, displacement and discharge, and which is spread over the memory-traces of ideas *somewhat as an electric charge is spread over the surface of a body*" ([1898] 1962, 60; my emphasis). Although it is uncertain whether Gadda had read this work, the definition in *Group psychology* paired with his own electrotechnical expertise are more than sufficient to justify his reinterpretation.

(2016, 228)⁸⁸

These values, in Gadda's ideal, would change according to possible deviations from the "normal" psychological profile, yet always amount to the same total. To the physical field models extending the influence of the individuals outside their corporeal borders, we can therefore add the idea of the transformation of energy which, having reached a certain maximum due to biological growth, can be invested or "sublimated" (in the cases in which it is devoted to higher goals), thus being redeployed in the human psychological system as positive force or logos (see *infra*). It could still be said that Gadda's own passage from electromagnetic to gravitational energy when describing narcissism is technically improper, but it is indeed possible that in so doing he drew inspiration from Einstein's mass-energy equivalence, or even more probably from the scientific analogy between the model of the atom and a planetary system, derived from the theories of Rutherford and Bohr. Once applied to human beings, not only does the atom-ego analogy represent a phenomenon that is strictly related to electromagnetic polarity, but it also allows to express the double character of single entity in momentary equilibrium (reacting to external energetic exchanges) and of centre of a diffused field of force, while adding the possible analogy between human contact and chemical reaction. Gadda deploys the latter metaphor while describing the libidinal investment, during puberty, towards a role-model, which allows for the identification with the latter in the form of "appropriazione o ingestione o incorporazione del modello" by the "Io potentemente centripeto dei 14 anni" (150).⁸⁹ His example is a character of Tolstoy's *War and Peace*:

⁸⁸ “

Total erotic charge: 100

= Narcissistic eroticism sublimated or not:	20.
= Normal heterosexual eroticism sublimated or not:	45.
= Normal Homosexual eroticism, mostly latent or sublimated or at least <i>déguisée</i> (<i>défroquée en gloire</i>):	5.
= Social eroticism sublimated or not:	20.
= Idolatrous eroticism scarcely sublimated, hereby included totemic eroticism:	10.”

⁸⁹ “[A]ppropriation or ingestion or incorporation of the model”; “strongly centripetal Ego of the 14 years of age.”

This process is taken from Freud's idea of identification with the love object described in *Group Psychology*, from which he also derives an analogy with cannibalism (Gadda 2016, 150; Freud [1921] 1955, 105). However, in that work Freud

Il Nicolenka [*sic*, i.e., Nikolaj Ilič Rostov] . . . ragazzo si innamora di Napoleone: giovine ufficiale, di Alessandro I: cioè successivamente dei due antagonisti . . . Tolstoi [*sic*] sembra significare: «L'Eros di Nikolenka in esaltata fase narcissica e in progredita fase puberale-sociale “ha bisogno” di scaricarsi sul modello, chiede a Dio un modello: il primo che gli capita sottomano, il coronato nano di Tilsit, satura la valenza disponibile.» (154)⁹⁰

Human egos, thus, have relations with external reality that are similar to an atom's, changing their configuration through the influence of energetic impulses which end up being introjected: again, the material and mental are systematically confused. This goes hand in hand with another metaphor, that of ideas-as-cucumbers, used in the second chapter to signify, with clear sexual overtones, those void ideals such as “Cetriolo-Patria” or “Cetriolo-Santità della Famiglia,” or “Cetriolo-Incolumità de la Stirpe” etc. (118),⁹¹ which become “parte incrementale dell'anima stessa” (119)⁹² and “carne de la carne” (122)⁹³ of the ones receiving them, in a metaphorical impregnation or, more blasphemously, a

considers identification as the “earliest expression of an emotional tie with another person” ([1921] 1955, 105), playing a preponderant part in the Oedipus complex, and explains it as a possible regression from adult love towards the object that leads to the object's introjection in the ego. He also explains the case of homosexuality as the introjection, within the ego, of the mother by a male subject. Additionally, Freud later distinguishes this form with the introjection of an idealised love object within the “ego ideal” (i.e., the earlier form of the “Id”). After puberty, for example, an object can be “*put in place of the ego ideal*” (113) if the subject cannot resolve their love for it. This leads to a kind of bond that Freud parallels with hypnosis, as the subject ends up having “unlimited devotion” for the object (115). Gadda uses such connection to describe the dangers of the narcissistic bond with the dictator. Interestingly, however, he also relates the process to the usual idealisation of role-models, thus to a developmental phase that draws its potential from internal narcissism. In so doing, Gadda stresses its latent homosexual character (love for a male model in the case of boys): “[È] impossibile che noi maschi si desiderino di assomigliare alla nostra balia” (“It's impossible for us boys to want to be similar to our nanny”; 2016, 149).

⁹⁰ “Nicolenka [*sic*, i.e., Nikolaj Ilič Rostov] . . . as a boy falls in love with Napoleon: as a young official, of Alexander the First: that is, of the two antagonists one after the other . . . Tolstoi [*sic*] seems to mean: ‘Nikolenka's eros during the exalted narcissistic phase and in the advanced puberal-social phase ‘needs’ to discharge on the model, asks God for a model: the first happening to be nearby, the crowned dwarf of Tilsit, saturates the available valence.’”

⁹¹ “Cucumber-Motherland”; “Cucumber-Sanctity of the Family”; “Cucumber-Integrity of the Race.”

⁹² “[I]ncremental part of the very soul.”

⁹³ “[F]lesh of the flesh.”

“consustanziazione” (120).⁹⁴ This argument has been connected by Alice Borali (2016, 45-56) to Freud’s theories, expressed in *Totem and Taboo*, on objectual love for things and abstract concepts. Gadda considered them as natural phenomena of the psyche which can, however, be exploited by the dictatorship. The importance of the question for him seems again linked to the relation between mind, matter and language, as the words expressing the false beliefs count exactly as their referents. In these passages, Gadda anticipated the metaphor with the electric charge, with a pattern that already refers in part to atomic reconfiguration:

L’idea sciocca, anzi il simbolo vuoto dell’idea, il veccione o guscione dell’idea che è lo inane vocabolo viene introitato in anima, disposto a la carica narcisistica o egocentrica o autoerotica propria di ogni anima. Concaricato nella carica il vocabolo è l’ideogramma narcissico, parte integrante dell’io, e divien «carne in Maria Luiggia». Mancare di rispetto al vocabolo è come mancare di rispetto al genitale de la Pizzigoni. (2016, 123)⁹⁵

Gadda’s representational views show the other side of the coin when connecting words to non-actual referents. In such case, words come to constitute part of human identity, in a sustained coalescence of mind, matter and language that spreads falsity throughout all its mixed components.

I want to highlight a last fundamental connection between Freudian theories and electromagnetism. In *Eros e Priapo* Gadda reconsiders what, in the *Meditazione milanese*, he had written about sentiment (which, as we have seen, he had derived from the concept of polarity) by including the issue of the erotic charge. Sentiment, before, was invariably characterised as a positive force. However, once the polarity connecting the system n to the system $n+1$ is reinterpreted in terms of libido, any possibility of a positive guide to follow must be reconsidered. The unconscious, as

⁹⁴ “[C]onsubstantiation.”

⁹⁵ “The stupid idea, or rather the empty symbol of the idea, the wild pea or horse chestnut that is the inane vocable is introjected in the soul, joined in marriage with the narcissistic or egocentric or self-erotic charge owned by each soul. Co-charged in the charge the vocable is the narcissistic ideogram, integral part of the Ego, and becomes ‘flesh in Maria Luiggia.’ Disrespecting the vocable is like disrespecting Pizzigoni’s genital.”

written by Raffaele Donnarumma (2006, 27-28), makes Gadda's idea of progress teeter. Nonetheless, here, Gadda still tries to maintain a shred of positivism, if uncertain:

L'io collettivo è guidato ad autodeterminarsi e ad esprimersi molto più dagli «istinti», cioè in definitiva da Eros, che non da ragione o da ragionata conoscenza. Questo non sempre, non ovunque, ma di certo nelle fasi morte o stanche della evoluzione e della storia e del costume individuo. Ché gli impulsi creatori e determinatori di storia si immettono nel grande deflusso per «quanti di energia» determinati, non già in un continuo apporto. Esprimendomi nei termini dell'algebra, dirò che l'impulso storico ed etico non è una funzione continua del vivere umano. (30)⁹⁶

Eros/libido has, at this point, become a force that is opposed to the positive sentiment, taking the place of rationality or logos. Yet, logos too derives from eros, being nothing but a transformation, a good employ, of that erotic charge that is at the base of all life. In this sense, Gadda reinterprets sentiment in terms of erotic sublimation, which can be successful only if the human internal system is well-functioning and groomed by an ethical society. Sublimation, here, takes up a Dantean character: “Nell'uomo normale la carica affettiva o carica erotica eterosessuale normale . . . è suscettiva 1.º) di impersonarsi in una femina eletta . . . 2.º) di «sublimarsi» in istati dell'animo che tendono a levar su da le bassure dell'essere il mastio verso la spiaggia . . . del migliorare sé, e la porca anima sua” (68-69).⁹⁷ This “impeto-disciplina” (69)⁹⁸ is defined as “spirito eroico” (70)⁹⁹ and linked,

⁹⁶ “The collective Ego is guided to self-determine and express itself much more by the ‘instincts,’ that is ultimately by Eros, than by reason or knowledge. This not always, not everywhere, but certainly in the dead or tired phases of history and of the individual costume. This because the historical creative and determining impulses enter the great downflow by determined ‘quanta of energy,’ and not in a continuous apporto. Expressing myself in algebraic terms, I will say that the historical and ethical impulse is not a continuous function of human life.”

⁹⁷ “In the normal man the affective charge or normal heterosexual erotic charge . . . is susceptible 1st) of embodying itself in a female of choice . . . 2nd) of ‘sublimating’ itself in mental states that tend to lift up from the hollows of being towards the slope . . . of bettering oneself, and one’s own Goddam soul.” The last words are a parody of Dante’s path up the hill from the dark forest in the first canto of the *Inferno*.

⁹⁸ “[I]mpetus-discipline.”

⁹⁹ “[H]eroic spirit.”

with a Plato-derived etymological pirouette, to the Greek “ἔρως” (“eros” as love).¹⁰⁰ It is in fact, however, nothing more than an evolution, through Freudian libido, of that “sentimento . . . eroico” (*SVP* 801)¹⁰¹ that in the *Meditazione* guided, as the voltmeter of action, towards the pole of the system $n+1$. It is needless to say that, given what we have seen, its natural course towards heterosexual love seems, if anything, at least a bit forced. Yet, the idea that human creativity and invention, or logos, derives from the control and channelling of a deeper and more chaotic form of energy is common with both Valéry’s negentropic theory of mind and Woolf’s Lucretian/atomic eros.

It is also notable that, in the quotation given before, the effect of sentiment as ethical historical impulse came discontinuously, by quanta of energy. The reference to quantum physics, which takes here the form of a very general analogy, prefigures the evolution of Gadda’s interpretation of libido which, in *Quer pasticciaccio brutto de via Merulana*, will assume the form of a “quanto di erotia” (*RR* 2:17).¹⁰² Prepared by the notion of polarity in the *Meditazione* – which, as we will see in ch. 3.4, already takes a form that is parallel (or connected) to quantum mechanics – and by Freudian libido, not only history in general, but the very erotic charge on which Gadda bases his whole new system will assume a quantic and discontinuous character. Here in *Eros e Priapo*, however, Gadda seems still unwilling to completely abandon the lingering positivistic side of his philosophy.

We have seen how Gadda developed his system, from the *Meditazione* to *Eros e Priapo*, by relying on analogical reasoning in close connection with physics, through a mixture of electromagnetism, gravitation, and atomic theories. While his methodology is close to Valéry’s, he relies on different theories and has a historical linguistic perspective which pairs up with a strong representationalism. He also shares Woolf’s interest with eros, but from a stricter and semi-quantitative framework. Moreover, his interest in the mind is redirected towards the social and ethical aspects of reality, although this does not come without problems. In the next sections, Gadda’s

¹⁰⁰ See Plato, *Cratylus* 398c-d.

¹⁰¹ “[H]eroic . . . sentiment.”

¹⁰² “[Q]uantum . . . of ‘eros’” (Gadda 2007, 6).

physical representation of the Ego will be explored both from the framework of gravitation (through relativity) and in its further involvement with quantum mechanics.

SECTION 2

LITERATURE AND RELATIVITY

Relativity, Imagination, Modernism

In 1918, in his discourse for the celebrations of Max Planck's sixtieth birthday at Berlin's Physical Society, Albert Einstein weaved arts, science, and philosophy together through their common impulse towards worldbuilding:

Man tries to make for himself in the fashion that suits him best a simplified and intelligible picture of the world; he then tries to some extent to substitute this cosmos of his for the world of experience, and thus to overcome it. This is what the painter, the poet, the speculative philosopher, and the natural scientist do, each in his own fashion. Each makes this cosmos and its construction the pivot of his emotional life, in order to find in this way the peace and security which he cannot find in the narrow whirlpool of personal experience. ([1918] 2002, 43)

Curiously enough, the four human types mentioned by Einstein are all accounted for among the characters of Woolf's *To the Lighthouse*: the painter Lily Briscoe, the poet Augustus Carmichael, the philosopher Mr. Ramsay, and the natural scientist (in Woolf's case, a botanist) Edward Banks. Physics is, to Einstein, the most regulated field, restricting the investigation to a minimal part of the world to reach a maximum of precision – "Supreme purity, clarity, and certainty at the cost of completeness" (44). Yet, as Lily's example will show in ch. 2.3, that same precision, and the necessity of a world-image that is "simplified and intelligible" (43), were in those years also prerogatives of modernist thought and artistic production. Following the celebratory mood of his speech, Einstein eventually referred to the "longing to behold" the pre-established harmony conceptualised by Leibniz,

the intimate and complete connection between thought and world, as the “source of inexhaustible patience and perseverance” (45) in the pursuit of scientific discovery for Planck (and, between the lines, for himself). Yet, such “longing” seems to be, even for Einstein, nothing short of a utopian pursuit, an impossible task furnishing but a direction of inquiry (see ch. 2.4).

In the course of this section, I will focus on Einstein’s most famous theory, relativity, in relation to the three authors under analysis. Einstein published his special theory in 1905 (“On the Electrodynamics of Moving Bodies”; see [1905] 1990c), focusing on inertial frames of reference, along with three other papers on the inertia of energy deriving from it, on the photoelectric effect, and on the Brownian motion of particles. In 1907-8, Hermann Minkowski represented Einstein’s world geometrically through a four-dimensional continuum, which he termed spacetime. In doing so, he was moved by an even stronger faith in Leibniz’s pre-established harmony (see Galison 1979). In those same years, Einstein had started reflecting on how to extend his relativity to non-inertial frames of references. After a collaboration with the mathematician Marcel Grossmann in Zurich, culminating in two papers in 1913 and 1914, he published his own revised version of general relativity – in fact a theory of gravitation – in a series of papers in 1915, and finally in a complete account in 1916 (see Janssen 2014, 167 ff.). The confirmation of his theory in 1919 (for which see ch. 2.2) led to Einstein’s enormous fame, and to the diffusion of a huge number of informed accounts, popularisations, and misinterpretations in all the possible venues of the world’s press, which still continues today.

Special relativity, with its two apparently incongruous postulates – that the laws of physics are the same in all inertial frames of reference, be them in relative rest or motion; and that the velocity of light is always constant (Einstein [1905] 1990c, 143-45) – led to the postulation of the slowing of time, the contraction of length, and the inertia of energy ([1905] 1990a) in systems in uniform motion with respect to each other. This part of the theory is so famous that I will assume that my reader is at

least familiar with it.¹ All information used in textual analysis that goes beyond the basics (including the fundamental traits of Minkowski's geometry) will be explained when encountered.

For now, I would only underline the importance of Einstein's imaginative and visual thinking in the construction of his *Weltbild*, which makes the theory itself, despite the impossibility of actually visualising a world in four dimensions, a mine of mental images, and aligns it at least in spirit to the work of our literary authors. Einstein himself, in his autobiographical sketches, noted the fundamental role played by visual thinking in his career, limiting the role of words to the mere communication of concepts:

What, precisely, is "thinking"? When, on the reception of sense impressions, memory pictures emerge, this is not yet "thinking." And when such pictures form sequences, each member of which calls forth another, this too is not yet "thinking." When, however, a certain picture turns up in many such sequences, then – precisely by such return – it becomes an organizing element for such sequences, in that it connects sequences in themselves unrelated to each other. Such an element becomes a tool, a concept. I think that the transition from free association or "dreaming" to thinking is characterized by the more or less preeminent role played by the "concept." It is by no means necessary that a concept be tied to a sensorily cognizable and reproducible sign (word); but when this is the case, then thinking becomes thereby capable of being communicated. ([1949] 2020, 158)

Gerald Holton has emphasised the preponderantly visual character of Einstein's reflections, relating it to his work as a patent clerk and his education in Aarau (1973, 367-75). It goes without saying that this kind of thought is foundational in mental experimentation. As Holton justly pointed out, the experiences with rulers, light signals, and clocks proposed by Einstein since the beginning were not operationalist concepts, i.e., they could not be reproduced in a laboratory with the necessary

¹ If this is not the case, I would suggest the reading, among the great number of expositions at various levels, of two particular cases: Einstein's own popularisation (see Einstein 1920, part 1, for special relativity), important as much for its precision than for its relevance for the historical period under consideration; and John D. Norton's online transcription of his popular lessons at the university of Pittsburgh, *Einstein for Everyone*, which are probably the best contemporary non-mathematical explanation of the theory (see Norton 2007, at least ch. 1-9).

precision: “Thus, the [relativity theory] merely shifted the locus of space time from the sensorium of Newton’s God to the sensorium of Einstein’s abstract *Gedanken*experimenter – as it were, the final secularization of physics” (171). In the course of his life, Einstein also recognised that many of his theoretical standpoints came from such mental experiences. In the same autobiographical notes, he considered the mental visualisation of pursuing a beam of light with the same velocity, which he had at the age of 16, as the “germ” of special relativity ([1949] 2020, 171).² To John Norton, such thought experiment could have been key for Einstein to move away, while thinking about special relativity, from an emission theory of light – where light’s velocity would not be fixed, but could be added to the velocity of the source emitting it (2014, 88-89).³ *En passant*, both Holton (1973, 261-329), and John Stachel (2002, 171-77) have refuted the supposed influence on Einstein of the actual Michelson-Morley experiment, which failed to prove the reality of the ether, thus weakening the idea that Einstein’s reflections started from experimental bases rather than theoretical contemplation (he nonetheless seem to have thought up a few ether drift experiments himself). Even general relativity seems to stem from what Einstein once called his “happiest thought”: the reflection that a falling person does not feel their own weight, leading to his equivalence principle collapsing gravitational and inertial mass into one single property (see Janssen 2014, 174 ff.).⁴ A mental experience of that

² “If I pursue a beam of light with the velocity c (velocity of light in a vacuum), I should observe such a beam of light as an electromagnetic field at rest though spatially oscillating. There seems to be no such thing, however, neither on the basis of experience nor according to Maxwell’s equations. From the very beginning it appeared to me intuitively clear that, judged from the standpoint of such an observer, everything would have to happen according to the same laws as for an observer who, relative to the earth, was at rest. For how should the first observer know, or be able to determine, that he is in a state of fast uniform motion?” ([1949] 2020, 171).

³ I am not going to comment here on Norton’s theory on the nature of thought experiments, for which see the introduction, 27, n. 34.

⁴ This was eventually translated into the thought experiment of the scientist taking measurements inside a closed chest being pulled in space by a being moving with constant acceleration (see Einstein 1920, 78-83; this is also known as Einstein’s elevator), which paralleled Galileo’s famous boat thought experiment in his 1632 *Dialogo sopra i due massimi sistemi del mondo* (“*Dialogue On the Two Greatest World Systems*”).

kind requires not only visualisation *stricto sensu*, but also the imaginative reproduction of a full corporeal set of sensations.

It is important to underline the analytical aspect of such mental experimentations: their function is to generate issues and problematise dubious elements by trying to seize a reality taken to extremes of sensorial simulation. Their what-if character and the impossibility of their actualisation confer them the nature of fictional worlds, while keeping them related to the actual world by looking for possible ways to confirm their accessibility relations. They are thus heuristic images, whose central value is in the inferences they can stimulate (see my introduction, 25-29). At the same time, being the purely theoretical product of a single mind, and one that is fascinated by the idea of a possible harmony, or at least the best possible balance, between thought and world, they cannot escape being ingrained with certain aesthetic preoccupations, what Gerald Holton calls the “thematic components” of scientific thought. In Einstein’s case, as Holton has emphasised, it is the search for logical simplicity and formal symmetry in the exposition of physical problems that plays a preponderant part: e.g., in the paper on special relativity, the will to unify the effects of the relative motions of magnets and conductors into a single phenomenon (1973, 167-69 and 362-67). This was probably, after all, what spurred Einstein to look for a general covariance (i.e., validity in any possible system) for the laws of physics, and what gave him an absolute conviction of the continuous character of reality. In Niels Bohr’s opinion, it was such “mastery for co-ordinating apparently contrasting experience without abandoning continuity and causality” that put Einstein at odds with the tenets of quantum mechanics (Bohr 1959, 206). In this sense, Einstein’s love for formal symmetry had a direct consequence on his worldbuilding, an even more significant example being his hypothesis of a closed and static universe in 1917, obtained by adding an *ad hoc* (at the time) cosmological constant in the calculations.⁵

⁵ I will not be talking about the cosmological constant in this work. For a good explanation on its role in Einstein’s static universe, and on the contemporary consequences of its supposition (for example in string theory), see for example Randall 2021, esp. 303-9. See also ch. 2.3 here for some of the popularisation of Einstein’s model.

As Katherine Hayles stated, “[r]elativity . . . contains two fundamental and related implications: first, that the world is an interconnected whole . . . and second, that there is no such thing as observing this interactive whole from a frame of reference removed from it” (1984, 49). These words capture both the continuous character of Einstein’s universe, and his attention towards the practical side of (mental) experience, but they leave aside the task, central in relativity, of finding those intervals that are common to all observers, thus maintaining an objective point of view. Moreover, as I will argue in this section, Einstein’s specific aesthetics of symmetry (and its connection with sensorial experience) reflects a profoundly modernist preoccupation, one that is in fact connected to the remnants (hoped, doubted, at times openly refused, but always problematically dormant in the background) of Leibniz’s pre-established harmony. Extreme formal preoccupation, revealing the ontological need of a symmetrical structure behind the chaos of the senses, will be most apparent in the earlier works of each author: both Valéry’s *Eupalinos* and Woolf’s *To the Lighthouse* will engage in what can be ordered beneath the “shower of atoms” of sense-data. In the case of Gadda’s *L’Adalgisa*, due, most probably, to the later date, the issue will be already presented in a much more problematised form, yet will directly inform the deepest structure of the work. Symmetry, as well as the dualistic approach of mind and body to the world, will thus be the key components of the following analyses.

World Architecture and Architecture in the World

Formal Relations and Relativity in Eupalinos

It is alluring that an author such as Paul Valéry, well-known for his cultivated disdain for philosophy,¹ would summon Socrates and give him the satisfaction to talk to his old passion, even if only as a shadow. Even more so since, despite having Socrates renounce his past and wail his lost opportunities, Valéry would still produce in his fictional dialogue a little treasure of maieutic, with resonances in many domains. *Eupalinos* is not a ruleset, nor does it provide the reader with a close system. As Geert Bekaert wrote, “Valéry plays with thoughts as if with bricks/building stones. He does not develop them. He provides no explanation” ([1994] 2008, 229). Nonetheless, or because of this, *Eupalinos* has been and is a source of inspiration not only for reflecting on architecture,² but also on art in general, and its relations with science in particular.

Written from October 1920 under the request of Gaston Gallimard to introduce a luxurious collection of drawings by Louis Süe and André Mare, *Eupalinos ou l'Architecte* (“*Eupalinos or the Architect*”) was partially anticipated in the *Nouvelle Revue Française* in March 1921 and finally came out at the end of September in 500 copies of considerable cost.³ The endeavour follows closely the upsurge in Einstein’s fame after general relativity was confirmed in 1919, an event which will play a

¹ For which, see ch. 1.2, 51.

² See the recent example of a workshop in Giudice and Rosso (2011).

³ The original edition is available on Internet Archive: <https://archive.org/details/Architectures00/mode/2up>. The text was then republished in 1923 with *L'Âme et la danse*, and only then reached a larger public. See also the introductory note in *Œ* 1:464 ff.

part in both Valéry's thoughts and in his private life. *Eupalinos* bears the marks of the poet's newfound interest. As will be explained in this chapter, one of its focuses is the aesthetic experience of an audience in front of (and, more importantly, inside) a piece of art, a situation where perception is strictly connected to the interrelations of space and time. The result is the exalting feeling of participating in a totality and overcoming one's private point of view through the help of geometry as a creator of networks: an experience thus strictly intertwined with the main elements of relativity. Architecture, considered as a total art, deriving from nature and the mind, beauty and cold calculation, becomes pivotal in defining both artistic and poetic creation and their effects. It becomes a key factor in the study of, and experimenting with, Valéry's fundamental trinity, *CEM* ("Corps Esprit Monde," i.e., body, mind and world), which was taking a definite form in those very years.

Even more importantly for the present case, this is explored by way of a *fictional* dialogue in which the protagonists, Socrates and Phaedrus, discuss with the help of visions of their past. *Eupalinos* is thus a reservoir of mental images and immediate sensations, creating and reflecting on mental architectures both as literal buildings and as organised structures, and building a parallel between perception and imagination. The text provides a system of thought that can be extended, even beyond Valéry's own hesitations, not just to architecture, music, and, between the lines, poetry (the pure arts) but also to all artworks with a focus on formal elements. In this fashion, and because of its basis within scientific theories, Valéry's apparently classicist work ends up being aligned with the contemporary avant-garde experiences which tried to express the consequences of spacetime reality. Being itself a fiction, *Eupalinos* also gives insights, again beyond Valéry's reservations, as to how such a result can be reached in the domain of narration, underlining the important role played by mental images, perception, movement, and symmetries as constitutional elements of fictional worlds.

In this section, I will use relativity as a paradigmatic framework to read *Eupalinos*. I will first provide a brief historical background for the events taking place in physics and their possible connection with the text. Secondly, I will read the text in light of the isomorphism between Socrates and Phaedrus' tale and relativity. Finally, I will briefly extend the discourse to Valéry's contemporary

practical art forms (painting and architecture) and move to their use in fiction and in storyworld creations, in order to provide a framework that will also be useful in the interpretation of Woolf's and Gadda's works. Aside from these last general reflections on fiction, I will try to stick as much as possible to the years immediately close to *Eupalinos*'s writing and publication.

The First Contacts with Relativity

On the 29th of May 1919 two British teams in Sobral (Brasil) and in Principe Island, captained by Andrew Crommelin and Charles Davidson, and by Arthur Eddington and Edwin Cottingham respectively, took advantage of a long-awaited solar eclipse to photograph the stars' positions near the sun. The objective was to find consistent proof to Einstein's general relativity theory. According to the latter, spacetime would be warped by the presence of a large mass like the sun, causing light to bend in its track and hiding the real position of the other stars. Newton had predicted a similar deflection, but according to Einstein the measurements should have found it doubled. The analysis of the results confirming the theory reached the general public through the *London Times* on November the 7th. It was the first of a long series of articles, conferences and books that made Einstein one of the most famous people on the planet.⁴ A week later (November the 14th), *The Athenaeum* published "Einstein's Theory of Gravitation," a brief unsigned article, in fact by Bertrand Russell ([1919] 1988), which described general relativity in a popular form and in light of the recent confirmation. Valéry's enthusiasm was such that he wrote a translation of the article and convinced Jacques Rivière to publish it in December's *Nouvelle Revue Française*.

Two things for now are worth of notice. First: after briefly explaining how relativity denies universal space and time, Russell added that, with general relativity, non-Euclidean geometries became an empirical fact in the presence of a gravitational field. As translated by Valéry, "[Einstein]

⁴ For a detailed account of the expedition, see Eddington (1920, 104-11). Regarding Einstein's fame, the work of Friedman and Donley (1985, ch. 1) remains a comprehensive description.

met au jour une hypothèse dont on peut dire, indépendamment de toute vérification ultérieure, qu'elle se range parmi les monuments les plus beaux du génie humain. On avait retouché l'œuvre de Newton; restait à remanier celle même d'Euclide" (Valéry 1919c, 1120).⁵ To give a simplified version of the matter, the theory's bulk is that the four-dimensional continuum, i.e. the mathematical entity through which any event (for example, the position of a particle at a given instant) can be defined by four coordinates, changes its characteristics depending on the presence of matter. This is due to the equivalence of inertial and gravitational mass, which makes so that no difference can be found between an accelerated system and one under the influence of a gravitational field. This is not a property of the masses, but of spacetime itself, which changes according to what it contains, functioning as a relational link between everything. The difference found in the calculations (including the "slowing" of time) can be expressed in terms of curvature: instead of lines, we now have, in the geometrical representation of a system, curves called geodesics, the shortest possible paths, in time and space, followed by a body; since the system of Euclidean geometry is flat (i.e., its curvature is zero, both in 2D and in 3D), it cannot be used to properly define coordinates, unless the presence of matter in the area is very scarce. Instead, Einstein turned to Carl Friedrich Gauss' theories and the variable-curvature geometry of Riemann deriving from it (see e.g. Janssen 2014, 182 ff.) in order to find what did *not* change with the point of view: the intervals, or the relations (i.e., the properties of spacetime) between events in a given area. As Michael Friedman, using a classic explanation, suggests, it might be helpful to visualise the results of such a system only in space. Thus, one should imagine "that the Sun is a massive ball placed on a rubber sheet . . . Gravity is not an external force acting on the planets (now viewed as comparatively much less massive test particles), but is rather a direct manifestation of the strongly non-Euclidean variable curvature" (2014, 399). This was remarkable for Valéry, in light of his long-lasting interest in non-Euclidean geometries,

⁵ "At this point Einstein intervened with a hypothesis which, apart altogether from subsequent verification, deserves to rank as one of the great monuments of human genius. After correcting Newton, it remained to correct Euclid" (Russell [1919] 1988, 207-8).

especially Riemann's work, which he possessed entirely (Robinson 1963, 34-35), and topology, and of his dedication to Poincaré's philosophy of science (on which I shall return).

Let us come back to Russell's article and its second important remark. After having listed the confirmations to general relativity, he proposed Einstein's work as having (again, in Valéry's translation) "au plus haut degré le mérite de la beauté. Elle est un vaste regard d'ensemble sur les opérations de la nature; la richesse des conséquences qui s'en déduisent est surprenante eu égard à la simplicité des prémisses qu'elle demande. C'est un remarquable exemple de progrès dû à la théorie pure" (Valéry 1919c, 1122).⁶ Even if Valéry always had an operational point of view towards science (seeing knowledge as a form of power to be put into action, and as a means of intervention on the world), he certainly had a leaning towards theoretical research, as his lifelong fascination of relativity testimonies.

Moreover, coming from a German scientist, the characteristics praised by Russell played a significant role in the realisation of an ideal of unified science in the First World War's aftermath. Valéry had commented on Germany's military use of science and technology in an English article published in *The Athenaeum*, which had come out in two parts between April and May of the same year. His "Letters from France" (reunited and republished in French as "La crise de l'esprit" in August's *Nouvelle Revue Française*) painted a scenery of the intellectual crisis of European thought caused by the takeover of scientific application as a means of military, economic, and political control over theoretical research. Germany, in this case, was the perfect example:

⁶ "Einstein's theory has the very highest degree of aesthetic merit: *every lover of the beautiful must wish it to be true*. It gives a vast unified survey of the operations of nature, with a technical simplicity in the critical assumptions which makes the wealth of deductions astonishing. It is a case of an advance arrived at by pure theory" (Russell [1919] 1988, 209; my emphasis). I emphasised a clause that Valéry skipped altogether. Indeed, Valéry's translation omitted some words here and there, especially in the end. I am not aware if this is due to length requests, but it is interesting that he would, just a few lines later, omit the parenthetical clause in the phrase "the whole effect of Einstein's work is to make physics more philosophical (*in a good sense*)" (209). If he had known that the article was by Russell, Valéry might as well have agreed with him, as both shared a preoccupation on the precision of philosophical language. Not knowing the author, though, made the brief comment a little obscure and, due to his aversion to philosophical discourse, probably disagreeable.

The great virtues of the German peoples have produced more evils than laziness ever produced vices. We have seen – seen with our own eyes – conscientious work, the most solid education, the most serious discipline and application, adapted to fearful designs. So many horrors would have been impossible without so many virtues. Without doubt, it needed much science to kill so many men, waste so many possessions, and annihilate so many towns in so little time; but it needed no less *moral qualities*. (1919a, 182)

In a situation in which science was “mortally wounded in its moral ambitions” and “dishonoured by its applications” (183), general relativity’s confirmation a few months later could only seem, to Valéry as to many others, as a step back from the chasm. It also confirmed the *modus cogitandi* that Valéry, in a mixture of progressive Europeanism and conservative Eurocentrism, exemplified as the reason for a supposed Western intellectual superiority. This discernment, stemming from Greek geometry, would have developed in a unified European history: “They [the ancient Greeks] trusted to the word to convey them, at once blind and clear-sighted, into space... And this space itself became every century a richer and more surprising creation” (1919b, 280). Einstein, with the help of the British Royal Astronomical Society, was now adding a new chapter to that history, turning Valéry’s text from the (indeed quite elitist) swan song of Western culture into a prophetic panegyric for future international cooperation.

Valéry’s interest in relativity did not wane in 1920. On the 17th of June, the meeting with his future lover Catherine Pozzi at a dinner party was marked by their discussion over scientific topics: she apparently had read of relativity from his own translation on the *Nouvelle Revue* (Jarrety 2008, 467). Indeed, Einstein’s theory remained a sort of code, a means of secret communication, throughout their relationship, which would last until 1928 (Marx 2020, par. 5). When he set out to write *Eupalinos* in October, he had just come back from a trip of a few weeks to La Graulet, where she lived; he will eventually dedicate the work to her. Moreover, in August, Valéry had read Eddington’s *Space, Time and Gravitation* (Jarrety 2008, 473), an account that, despite its popular tone, did not spare the reader some of the main mathematical formulas. Thus, even without a complete knowledge of the

mathematics, Valéry should have already had a good grasp of the theory when he started working on *Eupalinos*, especially considering his own mathematical preparation. What derived is a work on bodily experience, aesthetic sensation, motor perception, and their effect on imagination, in a space sharing the properties of nature and geometry.

Finding the Mind in a Body-World Symmetry

Eupalinos ou l'Architecte generates a double-layered storyworld. On the one hand, there is the dialogical situation, acting as frame setting: Socrates and Phaedrus, together in the afterlife, meet at the edge of the river of Time. On the other hand, there are their reminiscences, reconstructing events on the earthen plane that are at times crucial nodes in the characters' story.⁷ Story-building intermingles with theoretical reflection, in a hybrid narrative-essayistic form that performs a thought experiment by means of mental reconstruction and inferential pondering. The text is also a case of what Lubomír Doležel would call "literary transduction," and more specifically an "expansion" (1998, "Epilogue") of the setting of Plato's dialogues in general and, of course, of *Phaedrus* in particular. If Plato could propose his dialogues as actual descriptions of his master's teachings, Valéry had no problem considering them "literature" (as in fantasy), as he would for philosophical thought in general.⁸ Socrates and Phaedrus are thus freely transformed with only partial concern towards the so-called originals, to the point of having Socrates ecstatically imagining, towards the end, his own anti-self.

The setting itself plays a part in the development of the general theme. The afterlife, as the characters describe it, is a place of vacuity and semi-transparency. Only by discerning the edge of it can they (and we with them) find a fixed point. Their condition of pure souls, instead of

⁷ I have already underlined some of the features of this work in the past: see Giansiracusa (2022, 123-26).

⁸ "On appelle Science l'ensemble des recettes qui réussissent toujours, et tout le reste est littérature" (*C* 10:679; *Pl* 2:857; 1925). ("What we call Science is the set of recipes that always work, and everything else is literature"; *C/N* 4:250).

enlightenment, seems to only bring further alethic constrains: they are reduced to beings made of pure thought – bees who lost their home, Socrates would say (473). Looking at the river, they see time made movement, the dull flowing of past and future altogether, yet they cannot distinguish anything. We follow Phaedrus tentative visual discrimination, as the river slowly appears to him, until Socrates reveals its nature:

C'est que tu assistes à l'écoulement vrai des êtres, toi immobile dans la mort. Nous voyons, de cette rive si pure, toutes les choses humaines et les formes naturelles mues selon la vitesse véritable de leur essence . . . le jugement ne se fixe nulle part, l'idée se fait sensation sous le regard, et chaque homme traîne après soi un enchaînement de monstres qui est fait inextricablement de ses actes et des formes successives de son corps . . . Je plaçais la Sagesse dans la posture éternelle où nous sommes. Mais d'ici tout est méconnaissable. La vérité est devant nous, et nous ne comprenons plus rien. (*Æ* 1:475-76)⁹

At first sight, this quasi-Empedoclean continuous transformation seems to be connected with Bergson's concept of *durée*, an indivisible stream of thought.¹⁰ However, the differences should force us to reconsider: first, the river is external to the souls; secondly, it is not made of mental states, but of events. If we were to find a pictorial parallel to help us visualise what the two are seeing, we could think of Marcel Duchamp's *Nu descendant un escalier n° 2* ("Nude Descending a Staircase, No. 2"; 1912). The fact that Socrates identifies their condition with that of the "rêveur"¹¹ (475) could help explain their hopelessness, as it brings the impossibility to distinguish back to themselves. I would argue that it is the lack of a body, the fact of lacking a *space*, which makes time incomprehensible.

⁹ "That is because you are witnessing the true flow of beings, motionless yourself in death. We see, from this pure bank, all human things and natural forms impelled in accordance with the true speed of their essence . . . our judgement settles on nothing, idea becomes sensation before our very eyes, and every man drags after him a chain of monsters inextricably wrought of his acts and the successive forms of his body . . . I then placed Wisdom in the eternal station which now is ours. But from here all is unrecognisable. Truth is before us, and we no longer understand anything at all" (*CW* 4:67).

¹⁰ Indeed, in these same years Bergson debated the concept of time with Einstein, with Valéry's great interest, though I am not going to deal with the matter here. See Canales (2015).

¹¹ "[D]reamer" (*CW* 4:67).

Instead of being in an absolute position, as Socrates had imagined in life, they are now relegated to a one-dimensional point of view. In this predicament, unsurprisingly, they come back to a merrier setting: they recall the solid constructions at the Piraeus, and from there move in memory to the place of their conversation on love and rhetoric, the Ilyssus' banks. Thus, the only way they have to give meaning to time (or at least one time) is to bring forth their bodies, if only in their minds, into a solid surrounding. The new setting conjures the image of a temple to Artemis, closer to the bank.¹² This is but an excuse to introduce its fictional builder, Eupalinos of Megara, whom Phaedrus remembers as a friend. In a later preface (*CE* 1:472), Valéry admitted taking the name almost randomly from the *Grande Encyclopédie*: the actual person existed a century before Socrates' time. However, the reference to symmetry (*palin* meaning "in reverse," with the prefix *eu-* to indicate harmony or agreeability) makes it nothing short of a *nomen omen*.

Phaedrus' narration of his talks with Eupalinos brings to the fore the question of beauty as a means of experience. Refusing, from the otherworld, the Platonic ideal as too simple, Phaedrus shocks Socrates by defining beauty, in its innumerable declinations, as what puts the human being "sans effort, au-dessus de sa nature" (487).¹³ Again, it is an enhancement that, in Phaedrus and Eupalinos' opinion, cannot be reached by pure thought alone. Their discussion also touches upon creation: a process of self-discovery and self-construction obtained by relating oneself with the surrounding environment and modifying it.¹⁴ Following Valéry's fusion of knowledge and action, Eupalinos' architectural ideal borders between adaptation to and augmentation of reality. On the one hand, he can confidently state that "ce que je pense est faisable; et ce que je fais se rapporte à l'intelligible" (492),¹⁵ while on the other he can describe the proportions of a small temple of his built as "l'image

¹² See Plato, *Phaedrus*, 229c. The temple actually existed (it was dedicated to Artemis "Agra," i.e. of the countryside) until its destruction in the 18th century by the Ottomans. It remains in the drawings of James Stuart and Nicholas Revett: See Stuart and Revett 1762, ch. 1.

¹³ "[W]ithout effort, above his own nature" (*CW* 4:78).

¹⁴ "À force de construire, me fit-il en souriant, je crois bien que je me suis construit moi-même" (*CE* 1:491). ("By dint of constructing,' he put it with a smile, 'I truly believe that I have constructed myself'") (*CW* 4:81).

¹⁵ "[W]hat I think, is feasible, and what I do, is related to the intelligible" (*CW* 4:82).

mathématique d'une fille de Corinthe, que j'ai heureusement aimée" (492).¹⁶ Fragment of a time past made solid space with the help of mathematical ratio, the temple connects and preserves various spacetimes at once, by playing on the tension between order, perception, and brute matter. It triggers Eupalinos' classification between mute, talking, and singing buildings. The latter category surpasses any easy definition and requires delving into the nebulous realm of artistic discourse. Utility loses its preponderance as a criterion, subjugated by the search for enlightenment both in the creator and in the audience. It is here that the link with relativity, albeit in a form reflecting Valéry's own view, is strongest. Connecting music and architecture, Eupalinos arrives at the idea of a person who could unite space and time through matter and rhythm into a new universality:

Imagine donc fortement ce que serait un mortel assez pur, assez raisonnable, assez subtil et tenace, assez puissamment armé par Minerve, pour méditer jusqu'à l'extrême de son être, et donc jusqu'à l'extrême réalité, *cet étrange rapprochement des formes visibles avec les assemblages éphémères des sons successifs*; pense à quelle origine intime et universelle il s'avancerait; . . . Et se possédant enfin dans cet état de *divine ambiguïté*, s'il se proposait alors de construire je ne sais quels monuments . . . songe, Phèdre, quel homme! Imagine quels édifices!... Et nous, quelles jouissances!

– Et toi, lui dis-je, tu le conçois?

– Oui et non. Oui, comme rêve. Non, comme science. (496; my emphasis)¹⁷

Eupalinos' incredulity before his own conception, which he nonetheless uses as the utopian criterion for his creations, calls back to Valéry's earlier mentioned belief in Greek geometry as the

¹⁶ "[T]he mathematical image of a girl of Corinth, whom I happily loved" (*CW* 4:82).

¹⁷ "Just imagine strongly what would be the nature of a mortal pure enough, reasonable enough, subtle and tenacious enough, powerfully enough armed by Minerva to think out to the ultimate limits of his being, and therefore to ultimate reality, *that strange parallel of visible forms with the ephemeral combinations of successive sounds*; think... towards what an intimate and universal origin he would advance . . . And possessing himself finally in this state of *divine ambiguity*, if he then proposed to build I know not what monuments . . . think, Phaedrus, what a man! Imagine what edifices!... And for us what delights!'

'And do you,' I said to him, 'conceive this?'

'Yes and no. Yes, as a dream. No, as a science'" (*CW* 4:86-87; my emphasis).

starting point of Western scientific thought. Indeed, it seems that relativity reaches that very objective, making a new architecture out of the universe. An important difference, though, is that Eupalinos is trying to achieve an experience, not just a theory.

A major role in this is played, again, by the body. Eupalinos concludes his long speech by underlining, in the form of a prayer, its fundamental importance in artistic creation as “l’unique objet qui se compare à l’univers” (500).¹⁸ Only by considering the body in symbiosis with the world – thus, by acknowledging its role as a mental unit of measure – can the artist reach the perfection through “[l]es pierres et les forces, les profils et les masses, les lumières et les ombres, les groupements artificieux, les illusions de la perspective et les réalités de la pesanteur” (501).¹⁹

Despite Eupalinos’ talk of inspiration, divinity, and dream, one should not entrust his prayer to the realm of the esoteric alone. In fact, the relations between the body and geometry were a fundamental part of Valéry’s contemporary philosophy of science. Reflecting on the origins of the geometrical notion of space in *La science et l’hypothèse* (“*Science and Hypothesis*”; 1902), Poincaré refused any *a priori* notion of it. Instead, he derived it from the changes in the relations between solid objects and the inner sense of spatial orientation and movement of human muscles, including eye-movement. He called it “muscular sense” ([1902] 2010, 59): we could define it today, largely speaking, as a unification of kinaesthesia and proprioception. Geometry, thus, became a question of reciprocal readjustments between objects and human bodies: “[B]y means of this reciprocity is defined a particular class of phenomena called displacements. *The laws of these phenomena are the object of geometry*” (63). Interestingly, in Poincaré’s opinion, imagining different possible set of movements leads to non-Euclidean geometries. This mindset brought with it the conclusion that all geometrical knowledge is but a convention,²⁰ picturing a completely anthropomorphic geometry,

¹⁸ “[T]he sole being which can be compared with the universe” (*CW* 4:91).

¹⁹ “Stones and forces, outlines and masses, lights and shadows, artificial groupings, the illusions of perspective and the realities of gravity” (*CW* 4:92).

²⁰ The topic is touched upon in more detail in chapter 2.4, 195 ff.

inextricably linked to the human scale despite its abstractive procedures. Valéry's understanding of science in general (with a predilection for physics and mathematics), and of relativity in particular, can be retrieved from such a conception, which explains his focus on the body. Between 1921 and 1922 Valéry translated Eupalinos' prayer into scientific terms in his *Cahiers*:

Le corps est *l'explicateur* universel. Il est à ce point de vue le groupement des unités et appareils de mesure.

L'espace et le temps.

Le corps [*in margin*: tous les corps] est double chose – cette dualité le définit.

C'est un corps d'entre les corps et c'est le support de tous les corps. [*Addition*: Chaque animal est un type d'univers.]

Le corps et la notion fondamentale *d'Égalité*.

Le changement et le mouvement de notre corps annule avec un retard variable la variation du monde.

(C 8:407-8; Pl 2:850)²¹

He later added, right after a reference to Einstein's analogy between spacetime and a mollusc (on which I will return): "Or le syst[èm]e de référence réel c'est le *corps* – l'observateur c'est mon corps. La relation du corps au non-corps est l'objet dernier de la physique – cette relation non entièrement réciproque" (C 8:443; Pl 2:851).²² Valéry is here playing with the ambiguity of the term "corps," used to refer both to the human body and to bodies in the physical sense: the former's

²¹ "The body is the universal *explicator*. From this standpoint it is the grouping of units and instruments of measurement.

Space and time.

The body [*in margin*: all bodies] is a dual thing – This duality defines it.

It's a body among bodies and it is the ground for all bodies. [*Addition*: Every animal is a kind of universe.]

The body and the fundamental notion of *Equality*.

The modification and movement of our body with more or less delay cancels out the variation of the world" (C/N 4:244; the translations within square brackets are mine).

²² "But the real system of reference is the *body* – the observer is my body. The relation between the body and the non-body is the ultimate concern of physics – this relation not entirely reciprocal" (C/N 4:245).

autonomy in the readjustment of its perception has to deal with the latter's changes to make sense of the world, by finding its invariants. All knowledge (all power) comes from this. Indeed, relativity brought geometry out of its ideal realm and back to the natural world, as the geometrical properties of spacetime depended on matter. However, the theory did not assign any particular value to the human body: any apparatus would do. Thus, Valéry interpreted relativity with some reservations towards Einstein's view: perception *stricto sensu* remained fundamental. As Bernard d'Espagnat wrote, while Einstein's final goal (at least ideally) was to reach an objective view of reality, one independent from any human point of view, Valéry never doubted knowledge's anthropomorphism, to the point of questioning the meaning of reality itself (1983, esp. 227-28). This helped him develop an idea of objectivity as partially incomplete, similarly to what happened later on in quantum mechanics – although even then the physics of *human* perception in itself would be meaningless, to his own disappointment.²³ In *Eupalinos*, though, the characters' speculations are linked to the idea that, once mind and body (already inextricably connected) find their equilibrium, the borders of the self can be overcome to grasp larger structures: a look at the world from a still human yet perfected point of view.

This is also made explicit by Socrates while reflecting on Eupalinos' definition of singing edifices. Tackling the analogy between architecture and music, Socrates ponders on how both arts create all-encompassing experiences that enclose the audience in a subjectively designed environment, either by means of view or hearing. I will later come back to the specificity of this embodied reception. For now, what is important is the means through which the task is accomplished, as these experiences are indeed guided by geometry. By including in the same category geometrical figures and musical rhythms, both creating a clearly definable and regular movement, and linking

²³ Valéry never stopped worrying about the use of intermediaries, or *relais*, in research, given by the fact that, although “[l]a physique a nos sensations pour matière première” (“The raw material of physics is our sensations”), human senses, at a subatomic level, “*cachent* infiniment plus de choses qu’ils ne n[ou]s en montrent” (“*hide* from us infinitely more things than they reveal”) (C 27:564; Pl 2:915-16; C/N 4:302). On the topic, see also ch. 3.2, 235 ff.

them to a perceiver (in a fashion that builds on Poincaré’s definition), Socrates incorporates them within the same domain. Thus, geometry is turned into a process in which space and time are inevitably intertwined, hinting at its possible four-dimensionality: “La vue me donne un mouvement, et le mouvement me fait sentir sa génération et les liens du tracement. Je suis mû par la vue; je suis enrichi d’une image par le mouvement, et la même chose m’est donnée, que je l’aborde par le temps, que je la trouve dans l’espace...” (514).^{24,25} Immediately afterwards, Socrates underlines the importance of words in this creation, as the only way to bypass the figurative process and reflect on the concepts in themselves. He thus gives a modern, axiomatic conception of geometry, while building a bridge between poetic and scientific language as both creative enterprises, although for him only the latter can reach true precision. The link between art and science is tightened later on, as he considers geometers as artists building “mondes parfaits en eux-mêmes, qui s’éloignent parfois du nôtre au point d’être inconcevables; et parfois s’en approchent, jusqu’à coïncider en partie avec le réel” (543).²⁶ However, while Socrates, indeed still a philosopher in Valéry’s detrimental sense, is more focused on pure mental schemes, possible in nature only in a few cases (544), both Eupalinos and the other example of constructor given by Phaedrus (the ship-builder Tridon) never separate the

²⁴ “Sight gives me a movement, and the movement makes me feel its own generation and the connections of the figure it traces. I am made to move by sight; I am enriched with an image by movement, and the same thing is given me, whether I come at it through time or find it in space...” (*CW* 4:104).

²⁵ Note that a similar connection between sound and the fourth dimension is found in one of the comments added to the *Introduction à la méthode de Léonard de Vinci* in 1930. Reflecting on the analogy between lines of force in a magnetic field and world lines (i.e., paths in spacetime as defined by Minkowsky), Valéry writes: “Aujourd’hui, des *lignes d’univers*, mais on ne peut plus les voir. Peut-être les entendre? Car seuls les *trajets* que suggèrent les mélodies nous peuvent donner quelque idée ou intuition de trajectoire dans *l’espace-temps*. Un son continu représente un point” (*Œ* 1:915). (“Today, *world lines*, but we cannot see them anymore. Maybe hear them? Because only the journeys suggested by melodies can give us some idea or intuition of the trajectory in spacetime. A continuous sound represents a point”) (my translation, as *CW* is here scientifically imprecise).

²⁶ “[W]orlds perfect in themselves, which sometimes are so far removed from ours as to be inconceivable, and sometimes come so close to it as to coincide in part with the real” (*CW* 4:132). The perfection of such mathematical worlds remained imaginable until the end of the decade, when Gödel’s theorems denied the infallibility of any axiomatic system.

natural and the human. Mass, air, light, and its reflections (in Tridon's case waves and currents) are all kept into account.

Borrowing the words of Einstein, who was then similarly reflecting on the connections between relativity and geometry by drawing from the work of Moritz Schlick, Eupalinos and Tridon make use of a "practical" instead of a "purely axiomatic" geometry (Einstein [1921] 2002, 211). It is interesting to compare these passages with Valéry's much earlier *Paradoxe sur l'architecte* ("Paradox on the Architect"), a brief article published in the journal *L'Ermitage* ("The Hermitage") in 1891, to see the effect of older and newer influences. If there, hoping for a revolution in architecture, Valéry already proposed the analogy with music, it was at Wagner *Gesamtkunstwerk* that he seemed to be hinting. The artistic revolution was described as a magical event: the keywords were harmony and symphony, and the artist's viewpoint, strengthened by an "intelligence mathématique" (*CE* 1:75),²⁷ was realised with the mystical precision of an Orpheus. No reference was made to the body's centrality as a point of view, nor to nature's contribution to pure ideas: it was, we could say, a rather ethereal, purely mathematical, conception. Instead, Eupalinos project, while keeping up the same Wagnerian ideal, is strongly set on the physical experience. It engenders movement from within the weight of matter, while at the same time bringing forth rhythm as a place – in Socrates' description, "[un] édifice d'apparitions, de transitions, de conflits et d'événements indéfinissables" (504).²⁸ He literally builds for the readers a world where mass is experienced as energy, and energy as mass.

This is not to say that harmony does not play an important part in the construction, but that it starts from and comes back to the body. As Eupalinos' name suggests, harmony is obtained through symmetry, experienced as an equality of action and reaction. Living in a designed space, any movement, if only of one's eyes following the lines of the surfaces, inevitably engenders the feeling of a harmonious rhythm; conversely that same feeling of a path to follow constrains the movement.

²⁷ "[M]athematical understanding" (*CW* 4:185).

²⁸ "[An] edifice of apparitions, of transitions, of conflicts, and of indefinable events" (*CW* 4:95).

Outside of ourselves, and inside a new, totalising space, we can grasp regularities that go beyond our own perspective. Symmetry coincides with extension, through the glimpse of a rule.²⁹ Thus, we finally arrive at the meaning of the phrase causing such wonder in Socrates, as this extension, attained by aesthetical means, by action/construction and not by knowledge, results in being above one's own nature. It is, indeed, a condition relatable to Valéry's experience of the "Moi pur" as Robinson described it, a quality overcoming the usual entropy of the mind through the negative entropy (to use Erwin Schrödinger's term) brought by an invariant element: "Le Moi pur tel qu'il commence à le concevoir à partir de 1920 environ, c'est simplement l'invariant suprême du groupe de transformations mentales le plus générale possible" (1963, 73).³⁰ The connection to the Moi pur, as will be analysed more in depth later, is reached in *Eupalinos* by the experience of human artistic creation, and is itself an inherently *poietic* status. As we saw in ch. 1.2, while universality, for Valéry, is ultimately an illusion, it is still indispensable for creation. The same architectural and artistic quality, as well as the link between beauty and symmetrical structure highlighting a universal essence of nature, could be found in the theory of relativity, as prophesised by Eupalinos' utopic dream. In fact, this idea was confirmed on November the 12th 1929, when Valéry witnessed Einstein's conference at the Sorbonne (after one on the 7th), and Einstein made a similar analogy between relativity and architecture:

"A 5^h30 conf[érence] d'Einstein.

Je suis très intéressé vers la fin – Il se montre en grand artiste et c'est le seul *artiste* au milieu de t[ou]s ces savants –

Il développe son incertitude et sa FOI *fondée* sur l'architecture (ou beauté) des formes.

²⁹ In 1924, Valéry wrote: "Relativité est une symétrie. Relativité – Corde tendue entre le cheval et la voiture – action est indiscernable de réaction. Réciprocité" (*C* 10:700; *Pl* 2:857). ("Relativity is a symmetry. Relativity – Cord stretched between the horse and the carriage – you can't distinguish action from reaction. Reciprocity"; *C/N* 4:250).

³⁰ "The Moi pur, as he starts to conceive it from approximately 1920, is simply the supreme invariant of the most general group of mental transformations."

[Aj. revv.] Einstein: «*La distance entre la réalité et la théorie est telle qu'il faut trouver des points de vue d'architecture.*» Conférence, discussion du 12.

Rien ne m'a fait plus de plaisir à entendre, rien ne me confirme plus dans mes idées car dans le domaine $\psi\phi$ [i.e. psycho-physique] – c'est un million de fois plus *vrai* que dans le domaine ϕ [i.e., physique].”
(C 14:107; Pl 2:875)³¹

As Marx noted, this formal conception of both art and science is a fundamental point of contact between the two (2020, parr. 37-43).

An important example of natural form derived from the link with totality is given by Socrates in the image of the seashell. At the end of his disquisition on geometry, he relates his encounter with the unknown object, washed ashore on a windy day of his youth. This moment, indeed the most vivid of the dialogue, is set both at the limit between land and sea, i.e. known and unknown, ruled and chaotic, and at the crossroad of Socrates' own life narration, for this is the moment in which he becomes a philosopher, letting go of the possible architect or scientist within him.³² Describing it as indescribable, yet giving it matter and colour, making it shine under the sun (with the vividness given by its “radiant ignition,” as described by Scarry 2001, ch. 5), Socrates wonders: “Qui t’a faite? . . . Tu ne ressembles à rien, et pourtant tu n’es pas informe. Es-tu le jeu de la nature, ô privée de nom, et

³¹ “At 5.30 lecture by Einstein.

I found it very interesting towards the end – He is proving to be a great artist and he’s the only *artist* among all these scientists –

He explained his uncertainty and his FAITH *founded* on the architecture (or beauty) of forms. [Add.:] Einstein: ‘*The distance between reality and theory is such that we have to find architectural points of view.*’ Lecture, discussion on the 12th.

Nothing gave me more pleasure than to hear that, nothing does more to confirm my own views because in the $\psi\phi$ [i.e. psycho-physical] domain – it’s a million times more true than in the ϕ [i.e., physical] domain (C/N 4:267, and n. 75).

³² Interestingly, this scene seems to mirror a quotation from Isaac Newton given by Eddington at the beginning of his chapter on gravitation in general relativity: “I don't know what I may seem to the world, but, as to myself, I seem to have been only as a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me” (Eddington 1920, 85). In a sense, the young Socrates that Valéry depicts replicates Newton’s predicament, as he chooses to focus on the wrong object, turns his back to the sea, and reflects on human work.

arrivée à moi, de par les dieux, au milieu des immondices que la mer a répudiées cette nuit?” (525).³³ It is the combination of regularity and variation, the hint towards a larger structure, and the fact of being container and contained, that makes the object so oblique. Being, in all probability, the product of animal will and of underwater chaos, the shell (if indeed it is a shell) is at the same time a narrative object and the very form of artistic expression, indicating a secret design in an apparent chaos: it can be taken as a (mental) rule-made-matter for all creative endeavour, poetry and narrative included. As Laurence Dahan-Gaida wrote, reflecting on the prominence of form over mimesis in Valéry, “[l]a coquille est la figure par excellence pour Valéry: elle est la forme rendue visible de forces marines, dont le mouvement en spirale se répète dans d’autres tourbillons – oreilles, boucles, ondes, chevelures, etc.” (2011, 52).³⁴ Everything is in one thing, and one thing brings the signs of everything: a perfect symmetry. Yet, Socrates refuses this balance when he strictly distinguishes between the natural and the human, and between project and product.

Paola Villa (2020) has already built a solid link between Socrates’ seashell and Einstein’s analogy of the reference-mollusc to indicate the ever changing system of reference of general relativity (to which Valéry hints at in the *Cahiers*’ already quoted 1921 passage). The two are reconnected in a later essay, *L’homme et la coquille (Man and the Sea Shell; 1937)*, where Valéry is more explicit regarding his refusal of an anthropocentric reflection over the shell (Socrates’ “*who made you?*”) and its link with the general theory. As Villa writes, concluding, “The mystery of the shell’s slow formation is mirrored in the equally puzzling conundrum of generating a literary text” (2020, 29). It is time to delve into this conundrum: the value of architecture, and of the shell (as both a structure and a bearer of meaning) in the creation and experience of space.

³³ “Who made thee? I pondered. Thou resemblest nothing, and yet thou art not shapeless. Art thou a sport of nature, O nameless thing, that art come to me by the will of the gods, in the midst of the refuse that the sea this night has flung from her?” (*CW* 4:114).

³⁴ “The sea shell is the figure *par excellence* for Valéry: it is the form made visible of marine forces, whose spiralling movement is repeated in other vortexes – ears, curls, waves, hair, and so on.”

Real-Life Samples and Fictional Possibilities

Eupalinos' architecture is as imaginary as the shell: we, as readers, do not live it actually, but in a storyworld. It should be noticed, however, that similar spacetime constructions were being built, thought, or drawn by architects and artists in the same years in which Valéry wrote his dialogue, so that Valéry's aesthetics results rather progressive, despite his apparent classicism. Due to the taste for Ancient Greek art that permeates it, and its cult of geometric form, *Eupalinos* has already been connected with Amédée Ozenfant and Charles Édouard Jeanneret's (later known as Le Corbusier) early purist theories, for example by Gianni Contessi (Giudice and Rosso 2011, 17 ff.). In the late '10s and early '20s, the two explored architectural form through painting,³⁵ and indeed their work and theory were inspired chiefly by mathematics and geometry, and in particular by the golden ratio. However, their art had no declared connections with current physics, and tended to exclude time in favour of a perfectly stable order, for example by privileging canvases of 40x32 centimetres, a measure that, mimicking the visual cone's proportions, could be "grasped in a single glance" (Le Corbusier and Ozenfant [1920] 1964, 67). The regulating lines in which this measure was divided provided a total hierarchy, developing a static rather than a dynamic experience. Moreover, the two tended to refuse the use of the ornament, which plays instead an important part in *Eupalinos*.³⁶ Judi Loach accurately summarised the cordial relations between Valéry and Le Corbusier in later years, as well as the fact that both participated in the private meetings of the group *Le nombre d'or*, focused on the golden ratio and its oftentimes mystical inflections (see Loach 2016). However, although Valéry himself played around the ratio's esoteric connotations in architecture (for example in the 1931 play *Amphion*), this seems not to be the case of the more technically-oriented *Eupalinos* (and,

³⁵ Here architectural could be considered *lato sensu* as focused mainly on proportion and spatial connections: this means seeing painting as a construction in space.

³⁶ As Eupalinos' maxim goes, "*Il n'y a point de détails dans l'exécution*" (*CE* 1:480). ("There are no details in execution") (*CW* 4:71).

indeed, Loach herself does not mention the dialogue, despite the shell's role in the golden ratio symbolism).

A much closer link, to the point of wondering about a possible influence, can be found in the practical example of the Einstein's tower, an observatory in Berlin designed by Erich Mendelsohn from 1917 onwards, whose outer structure was completed between 1920 and 1921, soon becoming famous both in and outside of Germany. Mendelsohn approached Einstein's general relativity since 1913, the theory being still *in fieri*, thanks to his friend and client, the astronomer Erwin Freundlich, who in 1914 was prevented from conducting an experiment similar to Eddington's by the beginning of the world war. While being strongly based, from a theoretical point of view, on the physical theory, Mendelsohn's building found its visual sources from contemporary art, such as the German Jugendstil, the expressionist paintings of Wassily Kandinsky, and the futurist *Unique Forms of Continuity in Space* of Umberto Boccioni, while benefiting from the possibilities offered by reinforced concrete (Kathleen James 1994; see also Henderson 2008, 109 ff.). His work succeeds in representing the energy inherent in mass, and its warping of spacetime while moving, suggesting in addition the forms of the human body. There is a striking resemblance between Mendelsohn's ideas and Eupalinos', as shown by his letters to his wife. They express a similar anti-mimetic concept of art, and a focus on dynamism, mass, and light. As he wrote, "movement and countermovement show the balance. Between the two coefficients of direction – energies and sounds – stands the sudden transition, from light to shade, from black to white" and "[t]he balance of movement – in mass and light – mass needs light, light moves mass – is reciprocal, parallel, complementary" (17 June 1917; qtd. in Kathleen James 1994, 398). These are the same characteristics found in Phaedrus' description of his experience of Eupalinos' works: "il préparait à la lumière un instrument incomparable, qui la répandît, tout affectée de formes intelligibles et de propriétés presque musicales" thanks to "courbures insensibles" and to "combinaisons du régulier et de l'irrégulière" (*CE* 1:483).³⁷

³⁷ "For the light he prepared a matchless instrument, which would redistribute it, endowing it with intelligible forms and almost musical properties"; "insensible curves"; "combinations of the regular and the irregular" (*CW* 4:74).

Linda Henderson traces similar experiences in visual artists such as Theo Van Doesburg and El Lissitzky. The latter, in particular, developing Kazimir Malevich's suprematism, linked painting and architecture in the structures of his pictorial "Prouns" (acronym for "projects for the affirmation of the new") in search for an experience unifying non-Euclidean geometry and relativity's fourth dimension. Abstract form and colour became markers of an imaginary space, while time was expressed, once again, through movement, symbolised by force-tension. As he wrote in the 1925 essay "A[rt] and Pangeometry," "bodies are set in motion by forces. Suprematism has formed the dynamic tension of these forces. The achievements of the futurists and suprematists are static surfaces which indicate the dynamic (by symbols)" (El Lissitzky [1925] 1992). Soon, he was spurred to develop his theory in architectural form, completing his first "Proun Room" in 1923. It was designed, as Henderson writes, to "set his viewer into motion in an environment of geometric shapes painted or mounted on walls, creating a new kind of perceptual experience" (2008, 116).

In brief, the concepts expressed in *Eupalinos* were part of a more general tendency deriving from the diffusion of the new physical theories, one which had more to do with avant-garde than with pure classicism. At the same time, while, in Valéry's work, Socrates and Phaedrus agreed that the epiphanic effects of music and architecture could not be achieved in poetry and painting, due to their mimetic character imposing (linguistic or visual) intermediaries between form and meaning (506), early 20th century painters were abandoning this very conception, focusing on abstract and especially geometrical forms. Thus, they were either being of inspiration to architects (such as Kandinsky for Mendelsohn), or exploring the coalescence of the two arts (like Ozenfant, Le Corbusier, and El Lissitzky). This newly acquired spatiotemporal character of painting will be fundamental in reading Virginia Woolf. Yet, the reasons for this change were oftentimes the same as Valéry's: these representations could act as enhancers for new experiences, stimuli for thought.

Back to the sea shell. We have now the proper means to reveal it as a token of our main object of study: a visual image, created by way of narration in the reader's mind, which potentially contains the means of defining epistemological borders and, through them, reaching a general ontological

standpoint. Bearing the marks of the marine forces, from which it provided protection, and by which it was reshaped, it is not different from the ships designed by Tridon, the last character presented by Phaedrus. The link can be extended to Eupalinos' architecture. In fact, the presence of a recognisable measure is, in Socrates' reasoning, the core element of these artifacts, as well as what brings him to ponder over the shell. In thought-experimental fashion, by hinting at an order, these objects call for an inquiry into its motivations. As Socrates says:

[L]es arts dont nous parlons [i.e. architecture and music] doivent . . . au moyen de nombres et de rapports de nombres, enfanter en nous non point une fable, mais cette puissance cachée qui fait toutes les fables. Ils élèvent l'âme au ton créateur, et la font sonore et féconde. Elle répond à cette harmonie matérielle et pure qu'ils lui communiquent, par une abondance inépuisable d'explications et de mythes qu'elle engendre sans effort; . . . (507)³⁸

This creative fertility is at the origin of both art and science, and from both it can derive. A clear explanation can be found in his essay "Au sujet d'*Eurêka*" ("On Poe's *Eureka*"; 1923). A few pages after a disquisition on relativity's symmetry, Valéry noted the value of such purely imagined causes in the research for a universal system. Even if the task is endless, it is worth the try for what is picked up along the road, as by setting impossible goals one often finds unexpected revelations: "Il semble donc que l'histoire de l'esprit puisse se résumer en ces termes: *il est absurde par ce qu'il cherche, il est grand par ce qu'il trouve*" (CE 1:779).³⁹ As is well put by Karin Krauthausen, geometrical creations in particular have in them a power that allows "to go beyond one's own corporeal-imaginative experience" (2010, 243), which is the main tool to improve one's "'volonté de voir' ('will to see') as

³⁸ "But the arts of which we speak [i.e. architecture and music] should . . . by means of numbers and relations of numbers, engender in us not a fable, but that hidden power which makes all fables. These arts raise the soul to the creative pitch, and make it sonorous and fertile. The soul responds to that pure, material harmony which they communicate to her, by an inexhaustible abundance of explanations and myths which she engenders without effort" (CW 4:97-98).

³⁹ "One might say that the history of thought could be summarized in these words: *It is absurd by what it seeks, great by what it finds*" (CW 8:171).

an ‘*expérimentation psychique*’ (‘psychic experimentation’) and thereby as the source of discoveries in the arts, as well as in the sciences” (244).

Despite Valéry’s often-declared scepticism about the possibility to reach a universal knowledge, and despite his empiricism and his increasing doubts about the epistemic possibilities of imagination, *Eupalinos*’ ideal is still the same that he expressed almost thirty years before in the *Léonard*. It is, again, a problem of language and references, and of the joint effort of science and art to overcome linguistic and mental preconceptions, and to grasp new orders and relations (new formal structures) which, although human-tailored, seem to extend outwards.⁴⁰ As Tom Serpieters and David Martens wrote, while treating Einstein as an artist (as we have seen), Valéry also “fait régulièrement – pour ne pas dire systématiquement – des écrivains et des artistes, dans les réflexions qu’il leur consacre, des savants à part entière”⁴¹ (2017, 469), as in the case of Poe or Mallarmé, exactly because of their common focus on formal relations and their strive towards universality. Inspired by Eupalinos, and regretting having chosen the philosopher’s way – following concepts that were purely linguistic from the beginning – Socrates tries to put himself in the shoes of a geometer or an artist. He catches in so doing a fundamental constituent of modern art and, it can now be said, of modernist literature: the creation of formalised spaces as all-encompassing entities, which can allow to surpass one’s limited perspective through the union of sensorial and cognitive means. It is indeed a godly work or, as

⁴⁰ In the *Introduction à la méthode de Léonard de Vinci*, when Valéry considered how human beings perceive with a dictionary more than with the retina (see ch. 1.2, 49), the main topic was indeed architecture: “La plupart des gens y voient par l’intellecte bien plus souvent que par les yeux . . . la Maison! Idée complexe, accord des qualités abstraites. S’ils se déplacent, le mouvement des files de fenêtres, la translation des surfaces qui défigure continûment leur sensation, leur échappent, – car le concept ne change pas.” (“Most people see with their intellects much more often than with their eyes . . . the House! – a complex idea, a combination of abstract qualities. If they change position, the movement of the rows of windows, the translation of surfaces which continuously alters their sensuous perceptions, all this escapes them, for their concept remains the same”). In 1930, he added the comment “Un artiste moderne doit perdre les deux tiers de son temps à essayer de voir ce qui est visible, et surtout de ne pas voir ce qui est invisible” (“A modern artist has to exhaust two thirds of his time trying to see what is visible – and above all, trying not to see what is invisible”) (*CE* 1:880; *CW* 8:19).

⁴¹ “[Valéry] regularly – not to say systematically – makes full-fledged scientists out of artists and writers in the reflections that he devotes to them.”

Socrates says, one continuing the Demiurge's moulding (*CE* 1:559). Once entered, it becomes a new world:

Mais un temple, joint à ses abords, ou bien l'intérieur de ce temple, forme pour nous une sorte de grandeur complète dans laquelle nous vivons... Nous sommes, nous nous mouvons, nous vivons alors dans l'œuvre de l'homme! Il n'est de partie de cette triple étendue qui ne fut étudiée, et réfléchie. Nous y respirons en quelque manière la volonté et les préférences de quelqu'un. Nous sommes pris et maîtrisés dans les proportions qu'il a choisies. Nous ne pouvons lui échapper. (502-3)⁴²

As anticipated while discussing the seashell, Socrates' temple is not of marble and stones: it is something that he experiences with his mind and, being a spirit, literally from outside of that world, in the same way in which it is experienced by *Eupalinos'* readers. He is discussing world creation in a fictional world, recentering himself in a parallel universe as readers recentre themselves in his, in a game of Chinese boxes.

Reading the words quoted above, Peter Sloterdijk noticed how Socrates (with an anachronism that is not an exception in the dialogue) is actually alluding to the speech pronounced by St. Paul to Athens' Areopagus in the *Acts of the Apostles* (17, and esp. 17:28). There, Paul defines God as the one in whom "we live and move and have our being," which makes him, as Sloterdijk comments, "an alternative space, a super space which penetrates the profane and physical space" ([2006] 2011, 107). Once God's presence is accepted, the very nature of the world's fabric is changed. This experience, along with the experience of being in a house (or any planned space), is defined by Sloterdijk as "inherently a form of totalitarianism, a totalitarian practice by nature. Why? Because it is concerned with immersion, that is, with the production of an environment into which its inhabitants submerge, body and all" (106). Sloterdijk takes the concept of immersion from computer arts, and the practice

⁴² "But a temple, along with its precincts, or again the interior of this temple, forms for us a sort of complete greatness within which we live... we are, we move, we live inside the work of man! There is not a part of that triple extent that has not been studied out and reflected upon. In it we breathe in, as it were, the will and preferences of an individual. We are caught and mastered within the proportions he has chosen. We cannot escape him" (*CW* 4:93-94).

of being inside artificial environments by means of virtual reality, and he connects it to the one-sided world-images created by modern totalitarian regimes. As suggested by this last analogy, both architecture, religion, and a totalitarian regime involve delving into an entirely manufactured situation.

Moving on from Sloterdijk, it is easy to see the link between these experiences and the storyworlds that are brought up by a literary work. With two main differences: first, the active/passive role of the audience in the world; second, which connects literature and virtual reality and sets them apart from totalitarianisms and urbanistic architecture (with the Bible, I would say, in between), that while it might be difficult to escape dictatorial indoctrination or urban landscapes, the surrendering to literary art is the result of an active choice, a willing suspension of disbelief, as Coleridge defined it ([1817] 2014, 208). It goes without saying that the making of a literary storyworld requires a personal imaginative effort on the readers' part, but a constrained one nonetheless.

Coming back to St. Paul's exhortation to the Areopagus (and allowing ourselves a certain degree of heresy), letting oneself be immersed in a God-designed world bears a similarity, or rather a specularity, to immersing oneself into a storyworld. While in the former case a narration is applied to the actual world and in the latter to a newly actualised fictional world, in both cases the non-spoken acceptance is that the environment which surrounds us is the *constructed result of a will*. Readers and believers are, as such, guided by a complex construction of literary nature, made to see and focus on certain elements, to quickly pass on to others, and to recognise measures and ratios like Socrates' temple-dwellers.⁴³ Exiting the temple, or re-emerging from the godly world, would require one to refuse its actuality, and relegate it to a non-actualised possible world, in a similar fashion to the coming out of a storyworld, and back into everyday reality, after closing the book. The process of

⁴³ This similarity has been argued also by Thomas Pavel's analysis of fictional worlds: "Pushed to their extreme consequences, all major religions contain projects of complete ontological fusion. Does not the presence of the holy convert the entire universe by attributing to each of its parts a religious meaning?" (1984, 138).

“recentering” (see introduction, 20) furthermore, calls for the importance of the body (as bearer of perspective) in the experience of a literary work, especially when space (and the time in it) becomes the object of focus.

We can follow further down this road, with some preconditions. We could concur with Valéry that scientific theories are the product of human thought, and thus centred on the human perspective while striving to overcome it. We could also concur that this dialectical tension is indeed what bears the seeds for all discovery, which might be what attracted Valéry towards Einstein, despite the latter’s faith into the possibility of a completely objective knowledge (but even Einstein, it should be noted, had his own reservations on this).⁴⁴ With these premises, it is not difficult to see that, despite the gorge between the methods of physics and theology, Einstein’s theoretical enterprise is formally equivalent to St. Paul’s in its results, being conceived as a theory of the universe. As such, it partakes of the same totalitarian character: if we accept to live in Einstein’s world, its symmetrical quality makes it impossible to escape. Einstein, too, can be seen as a demiurgic figure, shaping the way in which we conceive the natural world. The totalising character of such experience is indeed the ultimate link between art and science in Valéry’s system of thought, as such a theory requires an imaginative component, being a description before it is a simple “recipe” for successful action (see n. 8 in this chapter). This also explains Valéry’s preference towards Einstein (and before him Faraday) as a sharer of the “universal” qualities of Leonardo da Vinci, despite his own operationalism. Of course, even once we recognise the work of imagination involved in the making of relativity theory (Holton’s [1973] thematic component), contesting it as “fictional” is not as easy as in the other literary cases. Yet, its characteristics really make it an architectonical entity whose parts express the whole. Or, rather, the parts make the whole substantial, as matter is literally linked to the fibre of the universe and space and time turn into a four-dimensional rubber. Indeed, Einstein’s theory is a type of structure that we can find applied to fictional creations as well.

⁴⁴ See ch. 2.4, 196 ff.

Let us recollect the threads followed until now, and apply these concepts to literary fictional entities in general. Drawing from early 20th century science, *Eupalinos* tells us that architectural creations become ways of materialising a certain spacetime by controlling their dwellers' perspective, by moving their bodies and capturing their senses. Their measures, their rhythms, and the relationships between their members force the occupants to look for a global system, to feel included in a totality. Architectonical measure is thus imposed onto the world: it brings shape and symmetry. Relativity theory seems to do the same, forcing a reconsideration of both space and time as results of perspective. In both cases, the perceiver reaches a state of feeling “*au dessus de sa nature*.” Outside of *Eupalinos*, and in the same turn of years, this link has been explored in actual architecture, and extended, to a certain point, to painting. Yet, at the same time, the buildings (and the seashell) presented in *Eupalinos* remain fictional creations, mental images generated in the minds of the readers, or the expression of the sensations caused by them. Their features (and especially their musical ones, i.e., their experience in time) can be extended to other similar fictional structures, making them catalysers of fictional ontologies inside larger constructs, and/or definers of epistemological limits. Given the real-life examples, even non-mimetic paintings could be included. Let us call these fictional objects *spacetime images*. To use a more precise language, spacetime images would thus be entities in-between particularly vivid mental images derived from the texts, *mises en abyme* (as their imagined form, explicit measures, or internal relations suggest the larger form of the storyworld that contains them), and allegories (due to their non-mimetic character, their figural semantic value). The fact that they need to be experienced in time makes narration their natural habitat, although, as we saw, they can appear in other forms. They can thus become central nuclei for the interpretation of narrative texts.

It should be reminded that we are here taking advantage of *Eupalinos*' maieutic value more than of its author's intentions, as Valéry was rather unsympathetic, with a few exceptions, towards the novel as a genre, often denying it an artistic status (see ch. 1.2, 66 ff.). While Valéry's theoretical opinion on narrative fiction is hardly acceptable (and indeed he did not seem to follow his own

preaching), it should also be noted that he himself could not escape the use of such medium to express the experience of the other arts. Being able to partially contain other art forms, literary narration allows to reproduce their effects or to play around them. Moreover, Valéry's disdain was most of the times related to the novelists' pretensions of truthfulness, for their resolution towards mimesis or their lack of formal attention, as in the case of French naturalism. Instead, what concerns us here is an opposite care, often alive in modernist literature, to research or suggest formal and structural relations (however complicated), without excluding them as epistemic tools. Once in act, the search for a deeper truth could be extended not only to logics and aesthetics, but also to both social and political matters. This will be the case in the interpretation of Woolf's *To the Lighthouse*, where space and time are explored both within the close borders of the Ramsays' house and of Lily Briscoe's painting, and of Gadda's houses and their measures in the collection *L'Adalgisa* ("*The Adalgisa*"). Given the mentioned spatiotemporal traits of such objects, Einstein's relativity will remain a useful paradigmatic framework to interpret them, in spite of each author's actual expertise. As Woolf probably had just an elementary knowledge of the theory, the latter will be used only as a formal comparison. Gadda's more technical preparation, instead, along with his own theorising about the novel, will make for a deeper entanglement between literary creation and physical theory.

*Form Shining from the Waters of Time***To the Lighthouse and Relativity**

After researching, in chapter 1.3, the significance of the shower of atoms falling on the mind's surface, we must delve, or better yet dive, into the depths below. Woolf shared Valery's interest for the Mind-Body-World network, and *To the Lighthouse* (1927) explores it with particular attention for the mutual crossing of their borders. What does it mean for the world to become part of the mind? And for different minds to meet a common world? What connects perception and imagination? And can art have a role in this? In the novel's storyworld, such concerns drive the narrative in the form of spacetime relations, orbiting around a central problem: death. As Hermione Lee stated introducing the edition henceforth quoted, *To the Lighthouse's* "subject is death, not just people dying or being mourned, but the wish for death" (TL xxxix). Not only a wish, actually, but all kinds of rapports with it.

What follows is an interpretation of Woolf's novel centred around such issues, using a framework derived from relativity theory in order to link together in a meaningful way space, time, body, and form. These elements have already been singled out by the critics, yet have oftentimes been considered as mutually exclusive – from the focus on the mind and the body's dismissal stemming from Auerbach's critique ([1946] 2003), to the large attention paid to time without consideration of space (or of space as differently conceived than time – for ex. in Caracciolo [2010]) or to the body in a phenomenological sense. However, such features are strictly interconnected, and reflect similar preoccupations to those addressed by relativity and its adaptation into the philosophy of that period.

Physics has already been related to *To the Lighthouse* by such critics as Mark Hussey, Sharon Stockton, and Paul Tolliver Brown.¹ Yet, none of these works have considered its contemporary reception in England around the period of *To the Lighthouse*'s writing (between summer 1925 and January 1927, but mostly from 1926), and Woolf's cultural "field of force."² In particular, the theory had a role, although not always an overt one, in Bloomsbury's cultural mixture, so that Woolf could actually have discussed some of its specifics without realising it.

The chosen framework imposes a refining of the classical interior monologue focus. It reveals a storyworld where mind and world tend to collapse. Everyone sees the same world, but is bound to their own perspective, each differently shaped by memory, imagination, and sensation. Space, time, and light play a fundamental part in this system and, as in relativity, the only way to reach the object is to overcome subjective vision by keeping all perspectives into account, reaching what is invariant between them. Death is imbued in these concerns, as its overwhelming presence can be felt both in thought and reality. This system is shown symmetrically through the characters' perspectives, the novel's structure, and the narration of artistic endeavour, represented by Lily Briscoe's painting. Art becomes both a means of expressing some truth about the world, and a relic that allows an experience to be lived again.

¹ Hussey looked at the text through the later theory of *holomovement* by the quantum physicist David Bohm, which he defined, in the words of Alice Jardine, as a kind of "gynesis," a "woman" discourse undermining older certainties (1995, 82); Stockton (1998) referred to Einstein's special theory and Freudian psychology to argue for Woolf's modernist retire into private time as a new means of significance and healing, but completely dismissed the value of external space in the story, which has been amply recognised; most recently, Brown (2009) connected the fictional Mr. Ramsay's and the real Leslie Stephen's objective view of reality to relativity, and opposed to it Mrs. Ramsay's at times holistic view, referring especially to the ideas exposed in the debates between Einstein and Bohr between the late '20s and the '30s, and again to David Bohm's scientific view. The final result is confusing, and does not consider the historical milieu of *To the Lighthouse*'s composition. It also mixes up different schools of thought within quantum physics, especially because Bohm's was, as Hussey recognised, a very peculiar conception within the larger quantum framework.

² See the introduction, 9 ff.

To explain all this, I will open with the historical setting, move to the question of mind, body, and world, and connect it to the novel's formal features. I will then draw a parallel with the painting as *spacetime image* and take the reverse road, from visible form to the novel's storyworld's properties.

The Historical and Philosophical Background

What did Woolf actually know of Einstein? According to her, not much: in 1938, writing to the Oxford student Elizabeth Nielsen, she affirmed that “I have not read Einstein; I should not understand it” (Banks 1984, 198). Yet, he appeared in some works immediately preceding *To the Lighthouse* as a topic of reflection.³ He was also the theme of a conversation at Clive Bell's in March 1926, a few days before Woolf wrote the novel's dinner scene: “I wanted, like a child, to stay & argue. True, the argument was passing my limits – how if Einstein is true, we shall be able to foretell our own lives” (*D* 3:68).

With this in mind, we should set the field of force. Focusing on the Bloomsbury group comes almost automatic, provided we first discuss the issue of direct influence. While there could be some such cases (I hypothesise at least one), it should be remembered that Bloomsbury's was chiefly a practice of conversation and mixture of ideas. Many philosophical topics required a university-level expertise, while Woolf's proficiency and interest was more literary and art-focused. I would thus agree with Jocelyn Rodal when she refuses Ann Banfield's idea that Bloomsbury philosophy provided a “logical skeleton” to support Woolf's art, as if it could not stand on its own (2018, 76).⁴ Although

³ Einstein is cited in *Mrs Dalloway* along with “speculation, mathematics, the Mendelian theory” in the mind of a random passer-by at the park, Mr. Bentley, who hopes to “get outside his body . . . by means of thought” (*MrsD* 30). This happens while a plane is passing right over Greenwich, joining the three dimensions of space and that of time (as already noted by Whitworth 2001, 186). In the short story “A Simple Melody” (written around March 1925), Einstein is seen as a topic of conversation, to be had in the open air free from any social constraint, in order to “come quite natural” (*HH* 196).

⁴ Regarding Rodal's use of the notion of variable to analyse Woolf's work, it seems to me that it produces finer results in reading *Jacob's Room* than in the other novels. On Rodal's analysis of Woolf's language, see also ch. 3.3, 294 ff.

Banfield (2000) often sees almost one-to-one correspondences between Bertrand Russell, Roger Fry, and Woolf, it seems more a matter of shared preoccupations and transformations than of clear-cut reuses. Among the common interests was the question of objective knowledge. In the philosophy of Russell and Whitehead, both close to, and important for, the group, the topic was addressed through relativity. Fundamental was the concept of *event* in the spacetime continuum, which turned the notion of permanent physical body into nonsense. As Russell wrote, “[w]hat is, for one observer, a description of the state of the world at a given instant, is, for another observer, a series of events at various separate times, whose relations are not merely spatial but also temporal” (1925, 69).

Such relations were first developed in 1907-8 by Hermann Minkowski’s interpretation of special relativity.⁵ In his four-dimensional geometry, the life of a body (its movements in space and time) can be collected in a worldline whose points are events definable by four coordinates. Every point is the vertex of two opposite light-cones, defined past and future light-cone, which describe the paths of any light-ray arriving at and departing from that point, respectively. Conventionally, in a three-dimensional simplification (two dimensions for space, one for time), they are set at 45 degrees with respect to the vertical worldline that would represent a body fixed in space moving through time. As no physical body can move faster than light, light-cones define an uncrossable limit: setting a diagram, an observer in a certain place at a certain time can be represented as an event (a point) at the origin of the axes, with the light-cones spreading from it. This origin represents the present, and the worldline of a body defines its proper time, i.e., the time experienced (take this verb not in an anthropomorphic sense) by that body. Moreover, we can draw a (in this case two-dimensional) spacelike “hypersurface” perpendicular to the worldline of a body, representing a frozen fragment of time that includes all events that, at that instant, are simultaneous in that frame of reference.

⁵ What follows is a general outlook of Minkowski’s spacetime. For Minkowski’s theory and its explanation in detail, see his papers on the topic in Minkowski 2012. A good non-mathematical explanation is in Norton (2007, ch. 7); a brief explanation, with easy mathematics, can also be found in Einstein (1920, 65-68 and 146-47); more complex but still quite accessible are Galison (1979); and Penrose (2004, 401-7).

If an object fixed in space describes a vertical worldline, moving objects result in tilted worldlines (and an equally tilted space hypersurface), approaching (but never reaching) the surface of the light-cone as they acquire more speed. Contact of bodies (including perception, of course through light) is contact of worldlines at one point. Time and space measurements made on bodies moving with different speed will then give different results, while the only measure remaining invariant for all observers is that of intervals, i.e., spacetime distances between two events. An interval will depend on the events' positions, within or outside the light-cones: while inside a causal connection can be established, outside this is not possible: the events' order would change in reference frames moving at different speeds and thus having their space hypersurfaces tilted at different angles (relativity of simultaneity).⁶ Simplifying the matter, Russell (1925, ch. 4) distinguished between space-like intervals, for events outside the cone, happening too far away for a perceiving apparatus to be present at both, and time-like intervals, within a light-cone, for events happening such that an apparatus, moving up to the speed of light, could be present at both. The third possibility is “when the two events are parts of one light flash – or, as we might say, when the one event is the seeing of the other. In that case, the interval between the two events is zero” (55). Causation, then, becomes possibility of communication through light: metaphorically, we live in “our” present, seeing light coming at us in a cone, while everything outside of it remains out of our perception.

As Andrew Paul Ushenko wrote, for Whitehead and Russell relativistic events paved the way, although with different results, “to render the traditional issue between idealism and materialism obsolete by showing that the distinction between ‘mental’ and ‘physical’ is epistemological and not ontological” (1959, 610). Whitehead’s doctrine has prehension at its core, i.e., the process through which sentient beings internalise the outside, distinguish sense-objects, and reach a perspective. He uses prehension “to signify the essential unity of an event, namely, the event as one entity, and not as

⁶ This explanation requires a good deal of visual imagination on the readers' part. In case of difficulty, I would once again suggest the help of John D. Norton's remarkable open-access popularisation, comprising a good deal of visual material: see Norton (2007, ch. 11-12).

a mere assemblage of parts or of ingredients” ([1925] 1967, 72). As Ushenko explains, although he developed a personal theory of gravitation (today refuted) in opposition to Einstein’s, Whitehead’s philosophy is deeply ingrained in the Minkowskian metric (1959, 620 ff.). On the one hand, everyone has their own actual world, where events are causally related by perception (and thus are within one’s light-cone). On the other hand, we consciously acknowledge an immense number of events happening at the same time independently from us: they lie outside the light-cone. Although Whitehead’s main work, *Science and Process*, came out only in 1929, these concepts were already exposed in his Lowell lectures published as *Science and the Modern World* (1925). There, he defines his view as organicist, as every local prehension is connected in space-time to all the others: “In a certain sense, everything is everywhere at all times. For every location involves an aspect of itself in every other location. Thus every spatio-temporal standpoint mirrors the world” ([1925] 1967, 91). This seems proved by the insistent feeling of communion with what is out of reach, which for Whitehead has its peak in poetry.

Russell used events in his neutral monist framework, which conceived the fundamental components of reality as neither mental nor physical. Especially in the ‘20s, he defined perception through relativity’s four-dimensional continuum. In a 1922 paper, he stated that “[i]t is into a physical world of this description that we have to fit our theory of perception” ([1922] 1988, 127), because physics “has a better chance of being true than philosophy has” (128). He thus substituted matter with events in spacetime. An event does not necessarily occur with someone witnessing it, but when it does it will be slightly different for each observer. What can be defined as mental is thus not the event itself, but the mind-event system: it is a matter of degree. An object will then be defined by the virtual sum of all possible perspectives. Already in his *Analysis of Mind* (1921), and consistently afterwards, Russell defined perspectives as collections of particulars (i.e., basic neutral sensations), and named their series in time “biographies.” Through this concept, he fit experience into relativity: “There is not one universal time, except by an elaborate construction; there are only local times, each of which may be taken to be the time within one biography. Accordingly, if I am (say) hearing a sound, the only occurrences that are, in any simple sense, simultaneous with my sensation are events in my

private world, i.e. in my biography” ([1921] 1989, 104). Objects (e.g., photographic plates) and sentient beings both have subjective perspectives in the physical sense. The latter’s biographies differ for the presence of “mnemic phenomena” connecting present occurrences to past ones: they are “what transforms a biography (in our technical sense) into a life” and, most importantly, they “give continuity to a ‘person’ or a ‘mind’” (105). It is easy to see that Russell developed the concept by taking the notion of worldline into psychology. Thus, our mind is but the result of our brain, and obtains permanence through the power of memory to relate together a string of perceived events.

Both Whitehead and Russell orbited around and were a topic of discussion within the Bloomsbury group. We see from their accounts that events in spacetime inextricably connect object to perception, denying an absolute point of view within a single mind. No objectivity can be reached by a single perspective: it resides in what is shared more than in the thing itself. A core element of most popularisations was exactly that “physics tells us much less about the physical world than we thought it did” (Russell 1925, 220). Relativity, therefore, especially in those years, was popularised as a sort of perspectivism.⁷ As Stephen Kern noted, even José Ortega y Gasset saw the fact that both his perspectivist manifesto and the paper on the general theory came out in the same year as a sign of the changing times (1983, 151).

We have now the main elements for our framework: perspectives of events in spacetime, worldlines as life, and light as information-bearer.

⁷ To explain local space and time more concretely, the question of the relativity of simultaneity was oftentimes put as a matter of personal opinion between two observers. Russell’s quite famous *ABC of Relativity* (1925) proposes a large number of such scenes, like that in which two people, one of whom is on a train, calculate different coordinates for the ignition of a star: “In fact, both are right, unless they imagine that the other must be wrong” (84). Eddington (1920) prepared the reader for the fact that “length and duration are not things inherent in the external world; they are relations of things in the external world to some specified observer” (30) by starting with a parallel with relative size using *Alice in Wonderland* and *Gulliver’s Travels* as examples. Herbert Dingle (1922) risked connecting relativity and relativism by describing a young man looking at a lady, and another lady witnessing that, so that while the man feels love, the second lady feels jealousy: “Here, then, we have a type of relation between events which we recognised as relative” (14).

Land and Sea, Light and Darkness

To the Lighthouse's storyworld is all about positioning: instead of having a clear-cut omniscient narration, we see the characters' inner worlds overlap and mix with the external one. What is the nature of these relations? The answer lies in such components as perception, imagination, light, darkness, and water. As we shall see, although there are elements that take up preponderant epistemic value (such as the painting as spacetime image), inferential patterns in the novel tend to work by a sort of cumulation-with-variation of hints. As a thought experiment, *To the Lighthouse* asks us to look into field-encompassing features.

Let us begin. We are in the first of the novel's three sections. Back from their stroll over the hedge to the bay's vista, on a summer day in the Isle of Skye, the scientist William Bankes and the painter Lily Briscoe consider their host, Mr. Ramsay, and his addiction to praise. Lily partially justifies him by referring to "his work":

Whenever she 'thought of his work' she always saw clearly before her a large kitchen table. It was Andrew's doing. She asked him what his father's books were about. 'Subject and object and the nature of reality' . . . 'Think of a kitchen table then', he told her, 'when you are not there'.

So she always saw . . . a scrubbed kitchen table. It lodged now in the fork of a pear tree, for they had reached the orchard . . . Naturally, if one's day were passed in this seeing of angular essences, this reducing of lovely evenings, with their flamingo clouds and blue and silver to a white deal four-legged table . . . one could not be judged like an ordinary person. (*TL* 28)

This most-quoted passage, seemingly holding the key to Woolf's philosophical stance, has been linked to a wealth of philosophers, from Leslie Stephen, to Hume, George Edward Moore, and Russell.⁸ In fact, though, tables and chairs were the bread and butter of English philosophy at least

⁸ I will limit myself to the question of influence, and to a few titles among the enormous mass of critical literature: Banfield, like me, considers the table "the paradigmatic object of knowledge in 'the history of English thought'" (2000, 66), but then focuses all her attention to Russell's "sensibilia," i.e. sense-data not collected by anyone (67 ff). Beer

since George Berkeley,⁹ especially when it came to discussing the existence of the objects behind sense-impressions. More importantly, the table is not considered from Mr. Ramsay's (i.e. the Victorian philosopher's) point of view, but from Lily's. And if in "Time Passes," the novel's middle section, tables are actually presented as existing when no one is there, here the emphasis is rather on visual thought and its equivalence to external reality. Lily's mental images are described as *seen* – a trope reiterated for all the novel's characters – and the "phantom kitchen table" (28) completely blends with the surrounding environment. If Mr. Ramsay, in the course of the novel, tries (and repeatedly fails) to isolate it from the senses and reach its objective definition, Lily seems to accept the impossibility of distinguishing between mind, body, and world. This is not just an issue about knowledge: it is a question of ontological boundaries. The table is hanging from the tree: but where is the tree?

Putting together the hints in the narration, we see that the mind does not only have a surface, as Woolf wrote in "Modern Novels" (see ch. 1.3): below it is a whole lot of space to roam in. Moving in it is usually connected to extending one's senses back to the past, as if threading through one's own worldline. But the space in which the Self moves is underground: at times a deep cavern, from which the world "tunnelling" (*TL* 188) comes from; at others a catacomb, the "chambers of the mind and heart" like "tombs of kings" (57); but most often it is watery places, filling or to be filled, where the surface but reflects a few features, covering the darkness below. These insisting metaphorical

(1996b) links the question to both Hume and Leslie Stephen; more recently, Justin Keena sustained that the entire novel "is in dialogue with Hume" (2018, 389); Erwin Steinberg (1988) sees Woolf as almost completely ignorant on philosophy, only to identify Mr. Ramsay with Moore later on. Apart from the "table-talk," there has also been research on Plato (ex. Wyatt 1988) and on Nietzsche (Nussbaum 1995); Michael Lackey (2006), instead, ultimately argues that Woolf refused philosophy as a productive method of inquiry.

⁹ "That neither our thoughts, nor passions, nor ideas formed by the imagination, exist without the mind, is what everybody will allow . . . The table I write on, I say, exists, that is, I see and feel it; and if I were out of my study I should say it existed, meaning thereby that if I was in my study I might perceive it, or that some other spirit actually does perceive it . . . For as to what is said of the absolute existence of unthinking things without any relation to their being perceived, that seems perfectly unintelligible. Their *esse* is *percipi*, nor is it possible they should have any existence, out of the minds or thinking things which perceive them" (Berkeley [1710] 1999, 25)

chains constantly characterise both the characters' sensations and the narratorial description. Mrs. Ramsay, ruminating on life while knitting a sock, is thus described: "Never did anybody look so sad. Bitter and black, halfway down, in the darkness, in the shaft which ran from the sunlight to the depths, perhaps a tear formed; a tear fell; the waters swayed this way and that, received it, and were at rest" (33). The mind can be a "well" (61); "pools of uneasy water" (144); the "lake of one's being" (71). To Lily, knowing a person is a matter of "unity," of "becoming, like waters poured into one jar, inextricably the same, one with the object one adored" (57). After ten years, she starts collecting her memory in order to take up her painting again: to her, it is like a voyage "on a narrow plank, perfectly alone, over the sea. And as she dipped into the blue paint, she dipped too into the past there" (187). At the sudden remembrance of Mrs. Ramsay's death, she is comforted that "[n]o one had seen her step off her strip of board into the waters of annihilation" (196). And these are just a few examples. We have to agree with Mrs. Ramsay, then, that beneath the surface of the mind "it is all dark, it is all spreading, it is unfathomably deep" (69). Time in the novel is *made* spatial through the presentation of an actual medium, water, filling the mind, one drop (or "tear") at a time, i.e. one event at a time. The deeper one delves, the darker it becomes, as light is less and less able to penetrate. If water is linked to the past, dipping can be dangerous: like the underground tomb, it is a place of death, but it is also what makes identity: the mind, thus, is itself made of time, the content of the "lake of one's being."

Is this purely the characters' imagination? Even if it is, the direct cause is found in the external world. Mirroring the mind's space-time equivalence, the characters relate distance in space with distance in time, towards both past and future. Looking at the bay's vista, Lily feels saddened, "partly because distant views seem to outlast by a million years (Lily thought) the gazer and to be communing already with a sky which beholds an earth entirely at rest" (25). At the same time, Bankes sees the remains of his past friendship with Mr. Ramsay in the sand, "like the body of a young man laid up in peat for a century" (26). Mr. Ramsay, similarly, pictures himself as an expedition's leader looking from a mountaintop at "the waste of the years and the perishing of stars" (41). His entire voyage to

the lighthouse after ten years (in the novel's third part) is a tentative approaching to his dead wife's memory, as the sea, with its mysterious depths and its regular back and forth, takes up the connection between time and death. As noted by Caracciolo, "[e]very major character in the novel envisages the island's engulfment" (2010, 255). Yet, it is not just a matter of humankind against nature: water and death seem to be identical. To Mr. Ramsay, for example, death is that "fabled land where . . . our frail barks founder in darkness" (8). Mrs. Ramsay at times feels as if the waves "like a ghostly roll of drums remorselessly beat the measure of life" (20). She is also haunted, throughout the first section, by the terror that her children might have drowned. Nancy, still a child, experiences the reduction of "her own body, her own life, and the lives of all the people in the world, for ever, to nothingness" (83) just by looking at the ocean. Importantly, "Time Passes" (the second section) portrays the same dynamics without the medium of character focus. It starts with Prue commenting on the night: "One can hardly tell which is the sea and which is the land" (137). Soon afterwards the narrator informs the reader that "a downpouring of immense darkness began": water and darkness are thus equalised, the latter coming in a "flood" (137). The confusion passes the mind-world border, so that "there was scarcely anything left of body and mind by which one could say 'This is he' or 'This is she'" (137). After the house is left abandoned, it is described as a boat which, just by adding the weight of a feather, "sinking, falling, would have turned and pitched downwards to the depths of darkness" (151). Only the help of Mrs. McNab and Mrs. Bast rescues it "from the pool of Time that was fast closing over" the furniture (152).

We have thus established a metaphorical equivalence between water, time, and death, as well as the confusion of their roles in mind and world. While these associations appear in other novels by Woolf, it is in *To the Lighthouse* that they receive most attention and are most reflected upon. Both mind and world are bound to be submerged, one way or another, but we can delve into the former at our risk and peril. We could connect Lily's "waters of annihilation" with what Theresa Crater, drawing on Therese De Laurentis' theories, calls "the underwater world of consciousness, the 'elsewhere'" (1996, 134) to be reached in order to overturn the patriarchal image of the Woman as

“Angel in the House” (128). As Crater correctly states, Lily is the first Woolfian character to come back alive from it, and her art has indeed a redefining power. Yet, we must concur with Roger Lund when, analysing the motive of Cowper’s poem “The Castaway” that is scattered throughout the third section, he states that death-by-drowning is ubiquitous, so that those who argue in favour of “Woolf’s praise of the artist” as a relief from hermeneutic ambivalence “minimize, even trivialize, those ‘profound’ truths as well as that pessimism which is also evident in the novel” (1989, 84-85). To these arguments, we must now add the equivalence between the water’s spatial (and mental-spatial) invasion and the flowing of time as an encompassing force. Time in *To the Lighthouse* literally fills up space. Woolf’s storyworld, then, is one in which the characters not only contemplate future death, but also carry death within them as their past, a confusion of forms in a raising underwater darkness which, one day, will fill them completely.

There is, however, an opposing force. As Whitworth wrote, “the novel is haunted by rays of light” (2001, 181), both from natural and artificial sources. Light is analogically linked with knowledge, distinguishing objects and people, and conveying a positive sense of what is to come. At times, this is but personal illusion.¹⁰ Mostly, though, it introduces an experience of revelation. During the dinner, for example, Mrs. Ramsay succeeds in reaching such a state, so that

her eyes were so clear that they seemed to go round the table unveiling each of these people, and their thoughts and their feelings, without effort like a light stealing under water so that its ripples and the reeds in it and the minnows balancing themselves, and the sudden trout are all lit up hanging, trembling. (116)

As for water and darkness, actual light plays the same role of its metaphorical or analogical counterpart, having a direct effect on the mind. The most representative example is Mrs. Ramsay’s identification with the lighthouse’s third stroke. Shrinking to a “wedge-shaped core of darkness” (69),

¹⁰ To Paul, for example, “the lights of the town beneath them . . . one by one seemed like things that were going to happen to him – his marriage, his children, his house” (*TL* 85).

while retreating into her own individuality, she finds herself in a state of “piece,” “rest,” and “eternity” (70). Be it bliss or quasi-death, it prepares her for absorption, so that, as soon as it becomes the only light present (the sun has disappeared), the lighthouse’s ray completely fills her mind as pure, raw experience: “[A]nd the blue went out of the sea and it rolled in waves of pure lemon which curved and swelled and broke upon the beach and the ecstasy burst in her eyes and waves of pure delight raced over the floor of her mind and she felt, It is enough! It is enough!” (72).

Light is the main means of the novel’s moments of being, as it is of spacetime events. Without it, no connection can be traced, no perspective exists. In fact, such moments usually happen at thresholds between light and darkness. It can be, just to give a few examples, Mrs. Ramsay’s just quoted epiphany; or dusk making the pear tree “silver-bossed” and the clouds “flamingo” (28) before Lily fixes her impressions of the surroundings “for eternity” (29); or the dawn “as the night wore on, and white lights parted the curtains” that Lily remembers to recollect her “sense” of Mrs. Ramsay (56); or, most noticeably, the moment of complete sharing at the dinner’s party, which begins when eight candles are lit, so that

the faces on both sides of the table were brought nearer by the candle-light, and composed, as they had not been in the twilight, into a party round a table, for the night was now shut off by panes of glass, which, far from giving any accurate view of the outside world, rippled it so strangely that here, inside the room, seemed to be order and dry land; there, outside, a reflection in which things wavered and vanished, waterily. (106)

Light, then, is the attribute of “order,” it allows to keep the flood at bay, and also shows, momentarily, some kind of pattern within the shower of atoms constantly hammering the mind. Pattern-recognition grants such moments their immortality, but to reach it, people need to have a “common cause against fluidity” (106). This is another constant in *To the Lighthouse*’s epiphanies, which calls for the analogy with spacetime events. Be it a dinner party; or the tentative analysis of some characters personalities (Lily, by the pear tree, considering Bankes and Mr. Ramsay’s temperaments); or of a deeper unity “like waters poured into one jar” (57), all successful cases imply

a fusion of perspectives: the characters have to look for, or to find together, what of the event is invariant for all of them, in order to step out of their minds and into the world. This also explains Mr. Ramsay's constant failure to find an object unbound from perspective, as his work is done in total introspection (not even noticing the people around him), unconsciously reducing everything and everyone to his own viewpoint, and with the constant distraction of his engorging ego – his rampant imagination of being leader of an expedition. In his quest for “R,” he refuses to see that Ramsay is, too, part of Reality, and is hindered by the oblivious privileging of his point of view.¹¹

Banfield terms moment-making “crystallization,” i.e. “the process by which something enduring is made out of the moment's impressions” (2003, 493). She correctly encapsulates it within a formalist framework, but considers Woolf as adopting a mixture of Fry's Post-Impressionist conceptualisation and Russell's idea of time as a succession of instants, with timeless universals, or “being,” distinguished among flowing particulars, or “existence” (490-97). Thus, she inserts Woolf within a specific philosophical subsection of the discussion on the reality of time: Russell's (and Moore's) attack on time's idealist refutation by philosophers like Bergson and MacTaggart. The frequent image of the moment of being as a crystal, however, seems important in its literal, objectual sense, for the crystal's ability to capture light, refract it and diffuse it from the darkness of the past. Once in the memory, an event that “shines out . . . like a ruby” (114) will have a preponderance in the series that constitutes one's biography.

Within the philosophical culture in which Bloomsbury's thought was imbued, not only were events intended in spacetime, but they were also commixed with the concept of “specious present,” i.e. a person's feeling of the present resulting from a protracted sum of perceptions and thoughts. Thus, each world-point included a quantum of duration. Russell took the notion from William James

¹¹ Paul Tolliver Brown identifies Mr. Ramsay's thought with Einstein's realism (2009, 52), yet the philosopher's inability to overcome the narrowness of his personal point of view puts him rather in opposition to relativity theory. Pacing the terrace, he considers his perspective as the privileged one: “He . . . looked once at his wife and son in the window, and as one raises one's eyes from a page in an express train and sees a farm, a tree, a cluster of cottages as an illustration, a confirmation of something on the printed page . . . the sight of them fortified him and satisfied him” (*TL* 38).

([1921] 1989, 145-46); for Whitehead, even more importantly, “[t]he total temporal duration of . . . an event bearing an enduring pattern, constitutes its specious present. Within this specious present the event realises itself as a totality” reflected by each of its “temporal parts” ([1925] 1967, 107). Such pattern resembles Lily’s impressions, which “danced up and down, like a company of gnats, each separate, but all marvellously controlled in an invisible elastic net . . . in and about the branches of the pear tree” (30). Eric Levy has in fact considered specious present as the novel’s “key to the meaning of life” (2006, 66). For him, its recognition by the characters gives them “the power of prehension to create life-sustaining meaning through reconciling the present with the continuous passage of time” (73). Curiously enough, to explain the concept Levy quotes extensively from Charlie Broad’s *Scientific Thought* (1923), which was openly indebted to the work of “Moore, Russell, Whitehead and Stout” (5) and included special and general relativity in the philosophical analysis. Levy does not simply regard the moment of being as an epistemic process (as Banfield tends to do), but rightly sets its preponderant value in the momentary defeat of the passage of time.

Once crystallised, the sum of sense-impressions collected in the specious present of an event can shine in the mind’s darkness and guide conscience back to it.¹² As we have seen, such perspectives are revisited by delving into the watery mind-spacetime. Moreover, they are both obtained and inhabited as places: guided by the lights shining within their worldline’s past light-cone, a person can be in two places, here and there, and in two times, now and then, simultaneously, like Mrs. Ramsay’s with the Mannings’ drawing room twenty years before, where she can return “gliding like a ghost among the chairs and tables . . . as if, while she had changed, that particular day . . . had remained there, all these years” (95). The crystallised moment of being, then, is a safe time somewhere and a safe place sometimes simultaneously. The importance of such spacetime edges is made clear at the end of the dinner, when Mrs. Ramsay keeps “her foot on the threshold” and “as she moved and took

¹² According to my interpretation, then, eternity in Woolf is not timelessness in Banfield’s sense (as in out-of-time being), but simply endurance in the past and its confusion. An event remains itself wherever we consider it, but cannot escape a worldline.

Minta's arm and left the room, it changed, it shaped itself differently; it had become, she knew, giving one last look at it over her shoulder, already the past" (121). Such coming and going between past and present, considering the established link between time, water, and death, brings about a sort of circularity, as the characters seem to be constantly passing the limit between life and death. If we consider, in addition, the mind-world confusion, the permeability of the life-death border becomes the main metaphysical propriety of the novel's storyworld.

From World to Form

The novel's structure mimics the dynamics just described, stressing on many levels a central life/death or light/darkness boundary that is crossed as part of a cyclical movement. In this sense, I agree with Caracciolo when he states that the traditional theory of the novel's three sections reproducing the dialectical movement through thesis, antithesis and synthesis, is "too simplistic" (2010, 263-64). I would like to consider the structure in detail, as it seems to correspond to the storyworld's metaphysical tenet. This involves looking not just at the tripartite division (i.e., the three sections: "The Window," "Time Passes," and "The Lighthouse"), but also at the chapters' numbers: there is more, it seems, than the simple "two blocks joined by a corridor" that Woolf envisioned in her early drafts (*TLDrafts* Appendix A/11).

First, circularity. The novel starts and ends at the same point within a ten-year gap, i.e. with Mrs. Ramsay (or her ghost) at the window and Lily painting in the same spot. Since the other characters are displaced, Lily's point of view automatically acquires a certain prominence. Moreover, considering I.1,¹³ we see that, although it begins with Mrs. Ramsay at the "drawing-room window" (8) in the late afternoon, the chapter's earliest moment is contained in an external completive analepsis (see Genette 1980, 48 ff.) taking place at lunchtime. The kids badmouth Tansley, get scolded,

¹³ I am using Roman numbers for the sections and Arabic numbers for the chapters so that, for example, I.1 is "The Window," chapter 1; II.10 is "Time Passes," chapter 10; III.12 is "The Lighthouse" chapter 12.

disappear “as stealthily as stags” in their room in the attics where “the sun poured” (12). Thus, the timeframe of “The Window” goes from lunchtime till around midnight. “The Lighthouse,” instead, begins in the early morning (Lily wakes up at the end of II.10) and finishes at lunchtime (see III.12) thus coming back exactly to the time of the day in which it started ten years earlier. “Time Passes,” then, roughly covers the sleeping period of this ten-year day: its timeline becomes confused, with overt linearity (e.g. seasons passing) complicated by various ellipses. Levy (2006, 47-50) notices this feature and considers it as time experienced traumatically, but it could well be interpretable as time during loss of consciousness and dream.

This circle is cut in half. The novel counts a total of 42 chapters, so that the middle is between the 21st and the 22nd. These are II.2 and II.3:¹⁴ the former finishes with Carmichael closing Virgil and blowing off a candle (the last light of the house) just “past midnight” (139), the latter (first step into the realm of darkness) contains Mrs. Ramsay’s death: “[Mr. Ramsay stumbling along a passage stretched his arms out one dark morning, but, Mrs. Ramsay having died rather suddenly the night before, he stretched his arms out. They remained empty]” (140). Margaret Tudeau-Clayton (2006) already claimed that “Time Passes” is conversing with Virgil’s *Georgics*’ first book, but Jane Goldman linked this scene more precisely with the story of Orpheus losing Eurydice right at the gate of the Underworld, both in Ovid’s *Metamorphoses* (10.1-77) and in the *Georgics* (4.457-527), to the point that Woolf’s unusual turn of phrase mimics an ablative absolute contained in Virgil’s verses (Goldman 2014, 39-42). Thus, to build on Goldman’s findings, right after crossing the border between the first and the second half of the novel, Mr. Ramsay undertakes the role of the lover looking back

¹⁴ Readers should be aware that the chapters of the first edition of *To the Lighthouse*, as well as all the following editions by Hogarth Press, had a misnumbering: “The Lighthouse” moved from chapter 1 to 3, skipping the second. There is no certainty as to whether this was done on purpose, but Jane Goldman (2014, 35) supposes that this might hint at the period before the war, 1910-14 (as the sections would then have 19, 10 and 14 chapters). The reader should decide by themselves, but I stick with the “correct” counting of my edition. As I consider the total sum of the present chapters, this should make no difference to my analysis (viz. the phantom III.2 should not be added), apart from the chapters from III.3 onwards. Still, even if we included III.2 in the counting, the centre of the book would be II.3, which for the most part preserves the interpretation that is about to follow.

and extending his arm over the limit to the other world. This life/death border is the gravitational centre of the book, towards which all action tends. Most characters in the first section are concerned with passing time and possible survival after death, while the third section shows Lily's and Mr. Ramsay's apparently disjunct efforts to remember Mrs. Ramsay (culminating in Lily's vision of the ghost).

The single sections repeat, in a fractal fashion, this half-cut light-darkness/life-death structure: the lighthouse is lit at the end of I.10 out of 19 chapters, and right afterwards, in I.11, Mrs. Ramsay fuses with it.¹⁵ In "The Lighthouse" (13 chapters) Mr. Ramsay, James and Cam's boat trip to the island, where the lighthouse is, functions as a clock: the boat suddenly stops "in the middle of the bay" (198) exactly at III.7 (when Lily drops into the "waters of annihilation").¹⁶ It is from that point onwards that James and Cam remember their mother, and Lily successfully conjures Mrs. Ramsay at the window. In III.8 the boat is still momentarily stuck, yet shots off before the end of the chapter. It is from that moment invisible from Lily's perspective: "They were gone for ever, they had become part of the nature of things"; or, to put it bluntly, they had crossed the border and entered the realm of the past (of death). A bit of smoke on the sea would look, to Lily, "like a flag mournfully in valediction" (204).¹⁷

¹⁵ Chapter I.17, the longest of the book, which represents the dinner scene, makes up for a smaller version of the section. The already quoted lighting up of the candles, to which follows the unity between the participants, occurs exactly in the middle (in terms of both pages and narrative time). At the end of the dinner, moreover, at the peak of the epiphany, Mr. Ramsay starts chanting Charles Elton's "Luriana Lurilee," the first poem actually shared to the group and not mumbled to himself. Carmichael, too, joins. Importantly, the poem hints at life as a repeating cycle.

¹⁶ This would be chapter III.8 (out of 14) in the misnumbered version, thus accompanied with (miscounted) III.7's description of Macalister's boy's throwing a live and mutilated mackerel back into the sea: imminent death and sacrifice.

¹⁷ The theme of the lighthouse's island as the Otherworld is reinforced by some references to Mrs. Ramsay as the Lady of the Lake, probably related to Tennyson's *Idylls of the King*. In III.5, Lily, starting to feel saddened by Mrs. Ramsay's remembrance, imagines that, if Carmichael (who takes the role of the officiant at the dinner) had spoken, "[a] hand would be shoved up, a blade would be flashed" (*TL* 194; see also 256 n. 20). To this, we could add the fish sacrificed by Macalister's boy in III.6, whose symbolism for Christ is enhanced by Mrs. Ramsay's narration of *The Fisherman's wife* in "The Window"; and that Cam, falling asleep on the boat, remembers her mother's lullaby: "[N]othing was left but a pale blue censer swinging rhythmically this way and that across her mind" (221). In "Gareth and Lynett," one of Tennyson's *Idylls*, the Lady of the Lake is sculpted on the keystone of the entrance to Camelot:

“Time Passes”’s timeline is, as anticipated, jumbled. The ten years are envisioned running “shapelessly together” (147). Still, the section forms a circle within the circle, enclosing a ten-year-long sleep cycle. The characters go to sleep in II.1 and wake up at the end of II.10 in the same rooms ten years later. Returning to the house, moreover, Carmichael thinks that “it all looked . . . much as it used to look” (155). Inside this frame, though, we witness a coming-and-going of light (most often the lighthouse’s ray) and darkness, destruction and peace. The centre, too, maintains a sort of importance. While II.5 describes a moment of calm, with McNab rolling “like a ship at sea” (142) around the house and “the mystic, the visionary” (143) finding some sort of answer at the beach, II.6 portrays the death of Prue and Andrew, the start of the war, and the end of the idyllic illusion that “beauty outside mirrored beauty within” (146). The doubt is that the “mirror itself was but the surface glassiness which forms in quiescence when the nobler powers sleep beneath?” (146). We are, once again, advised that in the depths something ominous is lurking.

Let us recap. With the mediation of the broad patterns identified until now, we can draw an analogy between the novel’s spacetime perspective and Minkowski’s model. The reader can imagine each of the characters in their own present, at the vertex of a double light-cone much like the centre of an hourglass. Reality comes towards them from the future light-cone, each event being experienced subjectively and stored in the “shaft” of the past light-cone, like Mrs. Ramsay’s “tear,” raising the water of time. Threading along their biographies, characters can retrieve their memories from that watery darkness. At their risk and peril: the past, after all, is a reign of death, divided by the border

And drops of water fell from either hand;
And down from one a sword was hung, from one
A censer, either worn with wind and storm;
And o’er her breast floated the sacred fish ([1859] 2014, 699; vv. 216-19)

The three references call for a thematic link between the lighthouse’s island and Avalon, the fabled land where Arthur is taken on his death, and under which the Lady of the Lake resides. Such reading seems in line with what we have found until now about the link between death and water, as the island would symbolically become the safe place where Mrs. Ramsay’s memory resides intact from the flow of time.

that is the plane of the present. Only the light stored in those special moments in which reality appeared in its inner structure can guide them. Such moments are those of shared perspective. The barrier, then, between what is past/dead and what is actual or future is porous to say the least. At the same time, the world itself replays a cycle of life and death, light and darkness, that allows for unexpected returns. This coming and going across the death-limit is itself mirrored in the novel's structure, where opposite forces face repeatedly in a central frontier.

Form, Novel, and Painting

Briefly said, *To the Lighthouse*'s formal properties bear semantic value. This is in line with Woolf's theory of the novel around the same years. The issue, connected to what has been said in ch. 1.3 about "Modern Novels," is clearly defined in "Is Fiction an art?" (October 1927). Reviewing Edward M. Forster's *Aspects of the Novel*, Woolf states that "fiction is treated as a parasite which . . . must, in gratitude, resemble life or perish" (*E* 4:462). She concludes: "In England, at any rate, a novel is not a work of art" (462-63). In August, in "Poetry, Fiction and the Future," she had already proposed an alternative to realist approaches, defining the novel as a "cannibal" form that could encompass poetry while expressing the contradictions of modernity (*E* 4:435). Her preoccupation with the novel's status was then related to minimising the uncontrolled: "Tumult is vile; confusion is hateful; everything in a work of art should be mastered and ordered" (438-39). Thus conceived, fiction would reach into previously untapped "influences" of the human spirit. Interestingly, such examples as "the stimulus of sight, the effect on us of the shape of trees or the play of colour . . . the obscure terrors and hatreds which come so irrationally in certain places" (439) seem directly taken from *To the Lighthouse*. But form was already fundamental in "How Should One Read a Book?" (1926), where the "definite shape" that a novel takes after reading, when "we hold the book clear, secure, and (to the best of our powers) complete in our minds" (*D* 4:397), is considered the most important element for criticism.

Form, thus, distinguishes art from bare mimesis. Form, moreover, should hold meaning. And as per those “influences,” i.e. emotions, that make the essence of literary art, they too should come out as ordered constructions. In “Pictures” (1925), considering that “now, undoubtedly, we are under the dominion of painting” (*E* 4:243), Woolf felt convinced that those emotions are first generated by “the eye” as the prominent medium combining with “the other senses”; thus, in writers like Proust, “we are shown the hard, tangible, material shapes of bodiless thoughts” (244). What we deal with is, at least immediately, abstract configurations made visible form: if we extend this concept to encompass the “definite shape” of the novel, we reach Lily’s painting as *mise en abyme*. This interpretation is generally accepted: as Paul Goring wrote, the “picture functions as a supposed literal visualization of the novel’s form” (1994, 222). However, as has also been noted (e.g., Goring 1994; Caracciolo 2010), the painting is hardly visualisable: we just have a few scattered elements to work with. I would argue that this is because Lily’s canvas takes up the role of a spacetime image, like *Eupalinos’* temple. It does not simply reflect the novel’s structure, but holds the key to its storyworld’s unrestricted perspective which connects space and time, puts the perceiver *au dessus de sa nature*, and generates meaning (and the quest for meaning, as proven by the colossal mass of academic work) out of its incomplete description. Lily’s painting (like Woolf’s novel) needs form to be art, and asks the reader to be painted with the mind-eye.

The painting’s connection to the temple needs development. Like the former, it is much more important as a creative *and* experiential process than as a product; a space containing time; centred on bodily experience, proprioception, and rhythm of perception; focused on formal/geometric properties. First, Lily’s ideal painting is actually two material paintings, a decennial mental effort: readers witness it in the making and in the effects which they are made to share with its creator. Secondly, Lily recognises it as a space that could capture her: “For what could be more formidable than that space?” (172). Not only is it experienced in the time of its making: it is filled with all her memories. It thus results in the formalised (and spatialised) equivalent of her past which, following the analogy with Russell’s biography, corresponds to her mind. In fact, Woolf adopts here the atomic

metaphors that we have learned to recognise in ch. 1.3: the single events of her life leave traces on the canvas like atoms on a screen: “her mind kept throwing up from its depths, scenes, and names, and sayings, and memories and ideas, like a fountain spurting over that glaring, hideously difficult white space” (174).¹⁸ Body and proprioception are as important. Starting anew after ten years, Lily has to recover the exact position, in order to try and summon her memories of the scene: “Yes, it must have been precisely here that she had stood ten years ago. There was the wall; the hedge; the tree. The question was of some relation between those masses” (161). While painting, she is repeatedly guided by the physical sensations caused by her surroundings. She thus obtains a “dancing rhythmical movement” (172) which changes “as if it [her brush] had fallen in with some rhythm which was dictated to her . . . by what she saw” (173). Sight leads to kinaesthetic tempo and, as with Eupalinos’ case, this symmetry connects mind, body and world. Through Lily’s embodied point of view, the readers experience the virtual space that the painting itself creates.

As widely agreed, Woolf was thoroughly inspired by Fry’s post-Impressionist theories. In fact, Lily’s main preoccupations – masses’ relations, lines, colour, lights and shadows¹⁹ – are all delineated in Fry’s “An Essay in Aesthetics” (1909), later collected in *Vision and Design* (1920). Fry listed them as elements of design, i.e., of the formal properties of a picture, capable of stirring the viewer’s emotions: “the rhythm of the line,” “mass,” “space,” “light and shade,” “colour,” and the “inclination to the eye of a plane” (1920, 36-37). Even more importantly, he connected them “with essential

¹⁸ Already ten years before, Lily’s approach to the painting is the same: showing the picture to Bankes, she feels that “that any other eyes should see the residue of her thirty-three years, the deposit of each day’s living, mixed with something more secret than she had ever spoken or shown in the course of all those days was an agony. At the same time it was immensely exciting” (*TL* 58).

¹⁹ “Even while she looked at the mass, at the line, at the colour, at Mrs. Ramsay sitting . . . she kept a feeler on her surroundings” (*TL* 22); “Then beneath the colour there was the shape” (23); “She saw the colour burning on a framework of steel” (54); “The question being one of the relations of masses, of light and shadows, which, to be honest, he had never considered before, he [Bankes] would like to have it explained – what then did she wish to make of it?” (59); “It was a question, she remembered, how to connect this mass on the right hand with that on the left. She might do it by bringing the line of the branch across so” (60); “One line placed on the canvas committed her to innumerable risks” (172); and so on.

conditions of our physical existence. Rhythm appeals to . . . muscular activity; mass to all the infinite adaptations to the force of gravity which we are forced to make; the spatial judgment is equally profound and universal in its application to life” (37) and so on. As Randi Koppen pointed out, Fry’s conception of visual art was strictly based on physical experience, resulting in a “notion of art as *disembodied*, a modernist turn away from ‘life,’ but at the same time a notion of art as grounded in physical and physiological conditions, *embodied* in the phenomenological or cognitivist sense of the term” (2001, 378). Woolf shared the same grounding through “the experiencing, physical body in a spatiotemporal, kinetic field” (382). Fry, indeed, might have got some inputs from Poincaré, which drew him closer to Valéry’s idea of art. At times, in fact, Woolf seems even closer to Valéry than to Fry. If the latter considered that the design’s emotional effect, although obtained through imagination and formal composition, is heightened by “the presentation of natural appearances, above all with the appearance of the human body” (1920, 38), Lily’s painting, with its focus on the purple triangle and central line, seems to be more aligned with Eupalinos’ geometric tendency than to Fry’s anti-abstract approach.²⁰

Still, Lily’s work encompasses Fry’s vision and design: “Beautiful and bright it should be on the surface . . . but beneath the fabric must be clamped together with bolts of iron” (186). Her composition orders the shower of atoms by way of a physical geometry centred on her own body. Her objective is the “unity of the whole” (60), the defeat of chaos,²¹ an endeavour that allows Bankes, the only one who sees the canvas in “The Window,” to proceed to its “scientific examination” (59). In “Art and Science” (1919), Fry, building on an article by the physics populariser J.W.N. Sullivan, distinguished between the two kinds of aesthetic pleasure derived from a painting or a scientific theory. He

²⁰ In fact, some scholars like Alison Heney (2011) and Margaret Tudeau-Clayton (2019) have drawn a link between Lily’s painting and Kandinsky’s abstract art. Although still open to discussion, the parallel is indeed endearing.

²¹ “A brush, the one dependable thing in a world of strife, ruin, chaos” (*TL* 164).

concluded that at the heart of both was “[t]he emotion which accompanies the clear recognition of unity in a complex” (1920, 54).²²

Even if readers are not provided with a full ekphrasis, the painting’s elements hint at the general structure of the novel, both in the first unfinished version and in the concluded remaking ten years later. Lily justifies the “triangular purple shape” reproducing Mrs. Ramsay with “no attempt at likeness” saying that “if there, in that corner, it was bright, here, in this, she felt the need of darkness” (58-59). In opposition in the two angles, the two are eventually divided by the “line there, in the centre” (226), in equilibrium like the masses of the hedge and the house. The light/darkness division of the novel is thus put into paint, and particular importance is given to the “dark,” “spreading” “shaft” constituting Mrs. Ramsay’s (and everyone’s) interiority. But, again, what is most important is the process, eventually leading to the return of Mrs. Ramsay’s ghost, like the closing of a circle. As quoted, in her recollection Lily “dipped . . . into the past” (187), into those deadly “waters of annihilation” (196). Her survival seems to be assured by her connection to the Ramsays’ boat (as she repeatedly looks for it) which keeps bringing her back from the watery depths of her mind. Her voyage thus runs parallel to Mr. Ramsay’s almost otherworldly boat trip in memory of his wife: one happening in time, the other in space, they both have the same destination: the world of the dead, an Orphic trip over the boundary and back. Lily’s connectivity comes from memory: after Mr. Ramsay’s first pitiful and distracting attempts to gain her sympathy, she finally praises his boots, tapping into the source of his youth and pride. Their link seems now real: he seems to her like a “leader making ready for an expedition” (169), as he saw himself on his way to reach R. From that moment until her final vision, she will be obsessed with giving something to him.

²² In general, the popular enthusiasm for relativity and the revolutionary style of contemporary art encouraged the analogy between the two, sometimes a bit too easily. For example, Thomas Craven, in the U.S. journal “The Dial” (to which Woolf too contributed at times), drew a parallel between the Einsteinian system and the “greater truth . . . far beyond that of mere vision” of the painters after Cézanne (1921, 538).

The first memory reached through the “formidable space” of the canvas is a flashback from ten years before: Lily, Tansley and Mrs. Ramsay on the beach, the latter writing letters while the two played ducks and drakes. Here, we have the entering of a crystallised moment: Lily recognises the power of Mrs. Ramsay to create “something – this scene of the beach for example . . . which survived after all these years, complete, so that she *dipped into it* to re-fashion her memory of him [Tansley], and it stayed in the mind almost like a work of art” (175; my emphasis). And, finally, we achieve the sense of Lily’s art as epiphany, the fixing of the pattern characterising an event, a section of spacetime seen in its unity:

Mrs. Ramsay making of the moment something permanent (as in another sphere Lily herself tried to make of the moment something permanent) – this was the nature of a revelation. In the midst of chaos there was shape; this eternal passing and flowing (she looked at the clouds going and the leaves shaking) was struck into stability. Life stand still here, Mrs. Ramsay said . . . She owed this revelation to her. (176)

This “shape” preserves a time in space and a space in time, sharing perspectives and thus glimpsing some essential structure of the external world (reaching an invariant element). It can be done by bringing people to a dinner party, making so that “looking together united them” (106); by painting, adopting many people’s perspectives, wanting “fifty pairs of eyes to see with” (214) to finally reach the beloved object; or, we could add, by reading, deprived of any omniscient position to lean on, reaching, as we have been doing, the form, not of the actual, but of a fictional world from the intersection of the characters’ personal worlds. In *To the Lighthouse*, these female-centred practices of sharing are opposed to the male egocentrism and absolute point of view of the likes of Mr. Ramsay and Tansley.²³ But the latter seem to represent Victorian self-assurance more than gender

²³ Charles Tansley’s problem, for the children “was not his manners. It was him – *his point of view* . . . until he had turned the whole thing round and made it somehow reflect himself and disparaged them . . . he was not satisfied” (*TL* 12; my emphasis).

As further proof of Victorian men’s absolute point of view – which would disprove Tolliver Brown’s connection to Einstein (2009, 52, and see n. 11 in this chapter) – Mr. Ramsay, the Victorian husband, and Paul Rayley, who is driven by

preconditions, as theoretical science and poetry join in the ranks of the former. Lily makes it explicit by considering that Bankes' love for Mrs. Ramsay "like the love which mathematicians bear their symbols, or poets their phrases, was meant to be spread over the world and become part of the human gain" (53). The poet Carmichael, too, helps both Mrs. Ramsay and Lily to reach their moments of being.

To gain those "fifty pairs of eyes," Lily moves from one memory to another, returning to Andrew (briefly at first, then again through Carmichael in III.11), Paul and Minta Rayley and Bankes (III.5), Tansley (III.3 and more specifically in III.11), Prue, and even Mr. Ramsay (III.11). Thus, they too come back from the past, as she brings them together again both in her and the reader's mind: like Mrs. Ramsay knitting a sock for the lighthouse keeper's son, she sews their biographies into the painting. With a further capability, a prerogative of art: invention. She thus completes the Rayleys' lives with made-up facts, before going on "tunnelling her way into her picture, into the past" (188). In a sense, she puts creativity in service of causal connection, reconstructs those parts of their biographies which did not interlap with hers, and restores those timelines that had been cut by the passing of time and the war. It is by treading/dipping through those lines, by assuming those reference frames, that she can find a path towards her beloved object: Mrs. Ramsay *over there* at the window, ten years before.

This multiple perspective allows for the ghost's final apparition. Surely enough, James and Cam too, passing the middle of the bay, remember past events with their mother. In James' case, the memory of his father sucking out her mothers' energies (see ch. 1.3, 91 ff.) brings with it a recognition of the equality between past and present: both the lighthouse that he sees in the distance and the one shining from his childhood dreams are real, "[f]or nothing was simply one thing" (202). Cam, too,

Mrs. Ramsay to a similar kind of marriage, are presented as the possessors of absolute space and time. Mr. Ramsay is described after the dinner with a compass (*TL* 133), and in "The Lighthouse" scolds Cam for not knowing "the points of the compass" (182). Rayley, instead, owns a "beautiful golden watch" with a "wash-leather case" which sparks Mrs. Ramsay's delight: "How extraordinarily lucky Minta is! She is marrying a man who has a gold watch in a wash-leather bag!" (127). Neither object helps the men in the face of life.

half-asleep, will re-join her mother tucking her into bed and reciting a nonsensical lullaby (see 124-25), even if just in the form of a “pale blue censer swinging rhythmically . . . across her mind” (221). In both cases there is a principle of confusion between past and present, mind and outside. Yet, Lily’s Mrs. Ramsay reaches complete integration with outside reality, as

quietly, as if she refrained, that too became part of ordinary experience, was on a level with the chair, with the table. Mrs. Ramsay – it was part of her perfect goodness to Lily – sat there quite simply, in the chair, flicked her needles to and fro, knitted her reddish-brown stocking, cast her shadow on the step. There she sat. (219)

Chairs and tables are that ordinary experience which Lily wanted “to be on a level with” while feeling, at the same time, “[i]t’s a miracle, it’s an ecstasy” (218). Mrs. Ramsay, too, becomes part of that mixed world, appears materially, casts a shadow. Is this all in Lily’s mind? Woolf seems to leave the question pending. In the following chapter, after Cam’s own vision, Mr. Ramsay, to whom Lily had until now “stretched her body and mind to the utmost” (225), will turn back to the island from where he came, just before leaping onto dry land: “What was it he sought, so fixedly, so intently, so silently? . . . he might be thinking, We perished, each alone, or he might be thinking, I have reached it, I have found it” (224). His children cannot know, but the reader, who *actually* shares the characters’ perspective but is bound to the narration’s linearity (better yet, to the fixed cruising speed of information) cannot escape the thought (never to be confirmed) that he is drawn towards Mrs. Ramsay, knitting at the window in that very moment. Lily doubles down on that suspect after her vision: “What-ever she had wanted to give him, when he left her that morning, she had given him at last. ‘He has landed,’ she said aloud. ‘It is finished’” (225). In the end, the metaphysical nature of the novel’s storyworld and the ontological connection between mind and world hinge on a question of relativity of simultaneity. Mrs. Ramsay has been called back like a light from the watery darkness of Lily’s mind, briefly becoming part of her world and allowing her to glimpse a form to preserve in painting. Mr. Ramsay’s awareness of that remains undecidable.

As we have seen at the beginning, Woolf discussed relativity at Clive Bell's in March 1926. At that time, Russell's *ABC of relativity* was one of the most recent popularisations. In chapter 11 of the first edition (later modified), Russell explained Einstein's early hypothesis of a stable spherical universe.²⁴ In such universe, travelling light is deflected by gravitational warp and, after roughly a thousand million years, circles back to where it started. Thus, stars reappear in the place they occupied before "like images in a mirror: they exist only for the sense of sight, not for any other sense . . . They are like ghosts in their habit of revisiting the scenes of their past life" (1925, 171). Such light returning out of the darkness of the universe seems in line with Mrs. Ramsay's reappearance. Whether or not Woolf actually drew inspiration from this model, her own fictional universe works in the same way, with light coming back from the past to be reexperienced in the present.²⁵ As we have seen plentifully, the way in which the mind works in *To the Lighthouse* reflects the storyworld's own structure, and the structure of the novel itself. The painting mimics that and repeats the same process, in that game of Chinese boxes that we have already seen in Valéry. The resulting storyworld is one where death is a primary component not only of reality, but also of people's individual identity. We could say, embracing Beer's statement that the novel acknowledges loss and surpasses its linguistic symbolisation (1996b, 46), that by making death what defines us, and the dead a part of us which, traversing us, come back into the world, Woolf expresses both the curse and the cure of human condition.

²⁴ Einstein abandoned the theory after Hubble's 1929 empirical confirmation of cosmic expansion.

²⁵ An interpretation based on the model of Einstein's universe, in a simpler form, was given by Holly Henry for Woolf's later time-travel short story "The Searchlight" (started in 1929 and concluded in its final form around 1941). See Henry (2003, 55).

*Gadda's Baroque Relativity**Deforming Space in L'Adalgisa*

We have seen how, in Valéry, the reader was led to experience, aesthetically, the feeling of a new spacetime through the hypotyposes contained in what seemed but a dialogue focused on theory. In a more direct manner, Gadda made use of architecture to express the will-made-matter of his satirised characters, showing the void behind their false myths by picturing the deformation they brought upon the world, with its delirious consequences. In this section, I am going to focus on his satirical collection of short stories *L'Adalgisa* (*The Adalgisa*; published in December 1943 with the date 1944) with an eye on the spatiotemporal coordinates in relation to the characters and their points of view. Once again, I am going to build a parallelism between the rules of the fictional storyworlds presented and those of the spacetime of special and general relativity. On this comparison stands my argument: on the one hand, *L'Adalgisa*, taking to extremes a Gaddian stylistic feature, refuses the misconceptions generated by a single point of view, which special relativity already denounced; on the other, it manages to achieve the almost impossible task of visualising spacetime distortion by way of baroque description, relentless metaphorical figuration, and “spastic” use of language (*SGF* 1:437).¹ It does so by playing with the connection between physical (both gravitational and electromagnetic) and mental forces which I explored in chapter 1.4, in an attempt to encompass human consciousness and unconscious, animal primeval instincts, and natural blind forces, under the

¹ See chapter 1.4, 106 ff.

aegis of the same set of rules: in short, to put them in a system. It goes without saying that the project is bound to fail from the start, as any final closure of a total system is impossible; still, what arises from it is a sense of inescapability from matter (the system n) when it comes to advancing to the system $n+1$ by way of thought or action. Furthermore, *L'Adalgisa* attacks the borders between the actual world and the storyworld through the text's structure, its genre-related features, and its porous relations with a semifictional paratext. Simply put, while exhibiting the fictionality of his storyworld, Gadda is striving to show his readers that it works like reality. As he wrote in the 1963 appendix to his novel *La cognizione del dolore*, “il grido-parola d'ordine «barocco è il G.!» potrebbe commutarsi nel più ragionevole e più pacato asserto «barocco è il mondo, e il G. ne ha percepito e ritratto la barocaggine»” (RR 1:760).²

Gadda and Einstein

The role of Einstein's relativity has already been recognised by Gian Carlo Roscioni in the analysis of the *Meditazione milanese* (1928). As Roscioni specifies, Gadda found in Einstein a possible way of criticising abstract thought: “«Astratto», per Gadda, non è soltanto un sistema rigido e chiuso come il gioco degli scacchi, ma anche la visione-sistema che di un paesaggio si costruisce da un unico osservatorio” (Roscioni 1995, 169).³ In fact, Gadda had considered relativity as a possible theme for a thesis already in May 1925, when he defined it as “un insieme di ‘prolegomena’ che non si possono lasciare da lato” (2006a, 58).⁴ He had also listed some main figures around the debates on the theory (Fitzgerald, Lorentz, Michelson and Morley, Ricci in Italy, Poincaré in France), demonstrating a good knowledge of the contemporary events. In those notes, he mentioned that he

² “[T]he cry-keyword «baroque is the G.!» should be commuted to the more reasonable and more temperate assertion «baroque is the world, and the G. perceived and portrayed its baroqueness».”

³ “«Abstract», for Gadda, is not only a rigid and closed system like chess, but also the vision-system of a scenery built from a single observatory.”

⁴ “[A] group of ‘prolegomena’ that cannot be put aside.”

had read about relativity only in popularisations, not possessing the necessary knowledge in absolute differential calculus. It should be also noted that he seemed especially interested in the theory's philosophical consequences, provisionally contemplating its meaning in relation to the Kantian noumenon. Even if he never wrote a thesis on it, Gadda's interest in relativity did not falter: as demonstrated by the catalogues of his books, he bought several popularisations in the years immediately preceding the writing of the *Meditazione milanese*.⁵

The foundations of Gadda's philosophy have already been summarised. Given the fact that they guided him throughout the years and that he tended to conflate them in his narratives, comparing his epistemology with Einstein's seems like a good starting point for an analysis. First, both saw that every knowledge is but provisional, a single step in a staircase without an end. To this topic, Gadda dedicated a chapter in the *Meditazione milanese*, aptly entitled "La dissoluzione dei miti" ("The Dissolution of Myths"). In fact, Roscioni's cross-referencing with other autographs led him to think that Gadda's starting point for this view was precisely Einstein's negation of the reality of concepts such as time and space (Gadda 1974, 342): proof that no fundamental idea survives indefinitely. Among Gadda's examples in the chapter is the Copernican revolution: the issue was that, while this was a relatively quick change, other ideas required much more time. He explained this by making an

⁵ A good deal of Gadda's books are stored in various libraries around Italy. Among them, at the Burcardo library, the French edition of Einstein's popularisation, *La théorie de la relativité restreinte et généralisée (mise à la portée de tout le monde)* ("The Special and General Theory of Relativity (Made Available to Everyone)"; Paris: Gauthier-Villars, 1927); at the Trivulziana library, Guido Castelnuovo, *Spazio e tempo secondo le vedute di Albert Einstein* ("Space and Time in the Views of Albert Einstein"; Bologna: Zanichelli, n.d.); and Rodolfo Lämmel, *I fondamenti della teoria della relatività* ("The Foundations of the Theory of Relativity"; Bologna: Zanichelli, n.d.), both signed and dated "10 giugno 1925" (10th of June 1925). Gadda also bought one of Einstein's detractors' books: Christian Cornelissen, *Les hallucinations des Einsteinien ou les erreurs de méthode chez le physiciens-mathématiciens* ("The Hallucinations of the Einsteinian or the Methodological Errors Among the Physicists-Matematicians" Paris: Blanchard, 1923), which however appears untouched. These are but part of Gadda's study of physics and science in general, one that goes beyond his Polytechnical preparation and continues for all his life. Moreover, there is no trace of the texts that Gadda mentioned reading before May 1925, apart from an opusculè received when he was studying engineering, which means that something might have been lost in his library's various (mis)adventures.

On Gadda's scientific library, see also Silvestri (2000, 58-62); Cortellessa (2003); Cortellessa, Iovinelli, and Pedriali (2001); and the most recent Alcini and Giuffrida (2022).

analogy with non-Euclidian geometries: “Ciò perché al matematico avviene di riconoscer subito ‘questa è una curva’ se una certa funzione della curva detta curvatura ha un certo valore. Ma mal si distingue una curva da una retta se la curvatura è piccolissima” (*SVP* 677).⁶ The reference to curvature seems like an extra hint towards spacetime. This conviction, by the way, should not be confused with some sort of epistemological nihilism, as Gadda specifies that, even though all ideas must eventually decay, “provvisorie non significa fittizie o false, come un assito provvisorio non è un ostacolo falso” (677).⁷

Einstein started from a strongly empiricist and positivist position (linked to Hume and Mach) implying the refusal of any “metaphysics,” to reach one that has been defined by some as neo-Kantian, leaning on some fundamental operative principles without overlooking the essentiality of experience. As Gerald Holton reconstructed from Einstein’s writings, this process took place gradually, yet its premises can be spotted *a posteriori* in special relativity’s conceptual framework, based on the suppression of theoretical asymmetries such as the privileged frame of reference (Holton 1973, ch. 8). Einstein’s famous 1905 paper started in this fashion, by noting the imbalance in the interpretation of the effect of a moving conductor on a magnet and, vice versa, of a moving magnet on a conductor ([1905] 1990c, 140). Surely, the passage from special to general relativity played a part in the radicalisation of Einstein’s work method: his object of study became the research of more general covariant properties (that is, unchanging with the change of coordinate system) of spacetime by means of pure mathematics, only partially sustained by later empirical confirmation.⁸ This meant that single pieces of data became useless if one wanted to discover general rules: intuition, or better said imagination, was needed instead, which brought up the problem of its relation to the actual world.

⁶ “This is because the mathematician happens to recognise right away ‘this is a curve’ if a certain function of said curve called curvature has a certain value. But hardly can one distinguish a curve from a straight line if the curvature is very small.”

⁷ “Provisional does not mean fictive or false, as a provisional wood plank wall is not a false obstacle.”

⁸ If the bending of light in presence of big masses could only be confirmed in 1919, other phenomena implied in relativity (such as the gravitational redshift) have been an object of debate for a long time.

Einstein kept his feet on the ground: in the 1921 conference “Geometry and Experience,” for example, he clearly stated that “as far as the propositions of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality” ([1921] 2002, 209). Inspired by the Vienna Circle’s logical empiricism, he distinguished between an autonomous “purely axiomatic geometry” and an empirically grounded “practical geometry.” Indeed, the latter gave a sense to the question if reality can be defined as Euclidean, one without which he “should have been unable to formulate the theory of relativity” (221). This recognition of the partial artificiality of knowledge differs from other views that stemmed from relativity, such as Minkowski’s subscription to a Leibnizian pre-established harmony between human mind and external world (see Galison 1979, 100-3). With his position, Einstein could bypass the rigidity of a purely mathematical system while disregarding the theoretical problems of conventionalist views such as Poincaré’s, for whom any geometry could do, thus Euclidian geometry had to be preferred for its simplicity. In “Geometry and Experience,” Einstein recognised the general validity of Poincaré’s position, but also admitted that certain primitive notions such as that of “practically-rigid body” (with respect to non-inertial frames of reference) remained for the time being indispensable to progress in theoretical research. With that, he could arrive at a non-Euclidean view of reality (235 ff.). This polarity between the call of new knowledge and the resistance of matter (or empirical data), leading to the provisional character of any result, also central in Gadda’s idea of knowledge, makes Einstein’s process genuinely heuristic in a Gaddian sense. However, it is important to recognise that Einstein limited his analysis to the theoretical; Gadda, with his engineering mindset, extended it to action. Thus, starting from similar premises, Gadda complicated the picture with the question of finality and resistance, in the scope of that same critique of abstraction that Roscioni linked to Einstein: “[L]a più semplice macchina non sarà priva di massa né di attriti. E una realtà storica urterà sempre contro vincoli estranei al suo fine” (*SVP* 658).⁹

⁹ “[T]he simplest machine won’t be devoid of mass nor of friction. And a historical reality will always clash against constraints that are unrelated to its end.”

This critique of pure idealism, as we will see, is central in *L'Adalgisa*, and in Gadda's fiction in general. Still, Einstein's confidence in the constitution of the universe, first and foremost its being a *continuum*, grew stronger with the years, leading him to refuse the postulates of quantum mechanics. If we follow Thomas Ryckman, who tried to define what was the "truly valuable" idea which Einstein wrote to have found in Kant,¹⁰ we have to postulate the "systematic unity" of cognition, which leads to aiming at the totality of experience, as Einstein's indispensable guide for research (Ryckman 2014, 386). Such mindset is "*not constitutive of an actual object of experience. Rather it is an indispensable regulative idea . . . providing an ideal goal and direction of inquiry that mark out the way knowledge is to be sought and organized*" (387). No single empirical data could lead to it. Even if Einstein assumed this unity critically, i.e., not as an *a priori* requirement, he maintained it as an operative precondition in his research for a total field theory until the end. In Gadda, instead, there is a conjunction between a total system taken into account in spite of its impossible definition, and a repeated falling back to the interminable mass of particulars listed in their overwhelming, if apparent, disorder, especially in narrative practice. Through Carla Benedetti's work, it is easy to see that, despite what Gian Carlo Roscioni would say about Gadda's necessity to "*omnia circumspicere*" (1995; ch. 3), Gadda's systemics, like more recent conceptions such as Edgar Morin's and Gregory Bateson's, refuses any possible totality of knowledge: "[P]er Gadda il «caos soprastante», o oscuro sistema esteriore, non può . . . essere integrato in un sistema dei sistemi che integri *tutti* gli altri, per la chiara ragione che esso è ciò che permette l'individuazione stessa di un sistema" (2004, 26).¹¹ If for Einstein unity suggests simplicity (and thus the elimination of asymmetries as a general rule of conduct), Gadda refuses simplification as unreal. Ultimately, given the similarity in the premises of the two, it is tempting to consider the different conclusions as due to a generally optimistic and an

¹⁰ "It is contained in the sentence: 'The real is not given to us, but put to us [aufgegeben] (by way of a riddle)' (Einstein 1959, 680).

¹¹ "[F]or Gadda, the «impending chaos», or obscure external system, cannot . . . be integrated in a system of systems integrating *all* the others, for the obvious reason that it is what allows for the very identification of any system."

increasingly pessimist but unrelenting attitude towards knowledge. Still, Gadda had in relativity a confirmation to his worldview. First, because relativity brought to the centre of the analysis not the single element but the relation between systems (to be considered as a covariant law); secondly, because it postulated a *general law of distortion* as a world-rule, where the presence of an object meant the warping of spacetime around it. For Gadda, moreover, thought and actuality are indissolubly entangled in the continuous deformation process. As written in the *Meditazione milanese*, “noi siamo convinti d’una cosa sola: che qualcosa accade e per accade intendiamo ‘si deforma’” (SVP 742).¹² Note in passing that “accadere” (to happen) can semantically imply an action, but not necessarily so: deformation can be brought by simple coming to existence. Thinking, too, can be seen as a happening.

Strengthened by these premises, let us delve into the storyworlds of *L’Adalgisa*. In the next section, I will summarise the editorial specifics, and discuss the questions of point of view and paratext in relation to the storyworlds and to special relativity. In the following one, I will focus on the narrated events and the net of links which, once established, creates an underlying system that tries to find some invariance in the chaos of existence. I will make this explicit with the help of general relativity.

Point of View as System of Reference

L’Adalgisa is a collection of ten short stories that develop a fierce satire of Milan’s bourgeoisie. The book, like others of Gadda, results from the reuse and rewriting of previous material, which includes three novels and a few later pieces.¹³

¹² “We are convinced of but one thing: that something happens and by happens we mean ‘it deforms.’”

¹³ The first story, “Notte di luna” (“Moonlit Night”), is taken from the unfinished *Racconto italiano di ignoto del novecento* (“*Italian Tale of a Twentieth-Century Unknown*”), dated around 1924, and had already been published autonomously in 1942; The fifth and the seventh, “Strane dicerie contristano i Bertoloni” (“Strange Rumours Aggrieve the Bertoloni”) and “Navi approdano al Parapagàl” (“Boats Land at Parapagàl”) are cut from the novel *La cognizione*

Still, the pieces maintain a certain kind of unity: their elements are amalgamated around a series of common themes, recurring characters, symmetrical structures, and a baroque *pastiche* that maintains a coherent tone out of its multifarious linguistic sources. Moreover, the text is supported by a mass of notes taking up around one quarter of the book: if many of them are brief dialectal and linguistic clarifications, a good deal are instead long divagations often appointed to words or phrases that apparently need no further explanation. They are, in a sense, pure digressions, but they also orbit around a bulk of shared concepts that help linking all the stories. If some short notes were already found in the original texts or in their successive versions in literary journals, all the longer notes were written between 1942 and 1943 specifically for the publication in volume: importantly, none appeared before. Therefore, they can only be the result of a conscious program of unification of the different pieces. In any case, the different backgrounds of the texts lead the reader into two different storyworlds: eight stories are set in Northern Italy from the beginning of the century until May 1931, while “Strane dicerie” and “Navi approdano” take place between 1931 and 1934 in a fictional South American Country, Maradagàl, a clearly parodical version of Lombardy’s countryside.¹⁴

The style follows the typical Gaddian recipe: first, the linguistic *pastiche*, with a preference for the Milanese dialect; second, a tendency of confusing the narrative voice with a mix of registers and technical languages. This mode of expression has been described extensively by Robert Dombroski:

del dolore (“*The Experience of Pain*”), which first saw the light of day in episodes in the journal “Letteratura” (“Literature”) in 1938-41, and as a novel only in 1963; the third and the fourth, “Carlo disimpara a vivere” (“Carlo Unlearns to Live”) and “Quattro figlie ebbe e ciascuna regina” (“Four Daughters He Had and Each a Queen”) are autonomous pieces, published in “La Nazione” (“The Nation”) in 1940 and in “Letteratura” in 1942 respectively; the five remaining pieces were taken from the second version (1933-35) of the unfinished novel *Un fulmine sul 220* (“*A Lightning on the 220*”), on which Gadda worked between 1932 and 1936. All of them had already come out in an updated form in various venues between 1940 and 1943. For the editorial information, see *RR* 1:839-50; and especially Gadda (2012, 351-70). For the relations between *L’Adalgisa* and the *Fulmine*, see at least Martignoni (2007).

¹⁴ *L’Adalgisa* has been previously analysed from the point of view of storyworlds theory by Marco Bernini (2015). While my starting points are similar to Bernini’s, my argumentation reaches substantially different conclusions. Moreover, Bernini seems unaware of, or chooses to overlook, the presence of two, and not one, storyworlds, as well of other elements. To avoid overburdening the reader, in the following pages I will refrain from referring to the basic parallelisms in our reasonings.

Gaddian satire in its most developed form possesses a distinct feature . . . What distinguishes Gadda from the satirists and the macaronics of old, from Swift or Sterne, from Joyce, and from the variants of plurilingualism and humorous writing he could look to in his own native Italian tradition (Dossi, Faldella, etc) is his practice of dispersing the narrative voice along a varied trajectory of different linguistic registers. By this I mean that Gadda's fiction texts are wholly decentred, deprived of an overriding consciousness that frames the narrative, which conveys the story's message either thematically or by means of the style it employs. (1999, 55)

The reasons behind this uniqueness are certainly interesting, but we should first focus on the means. In fact, at least in *L'Adalgisa*, the presence of a recognisable main narrator in the Milan stories is structured according to a program of progressive weakening of the narrating authority, paired with an attempt to collapse the storyworld into the actual world.

As already noted by Giuliano Cenati (2010, 51-63) the narrator takes up a testimonial function, gradually revealing himself as a character relying on circulating rumours. The procedure is worth going into some detail. "Notte di luna" opens the collection with a panoramic exordium (a lyric description of a Northern Italian countryside). The second story too, "Quando il Girolamo ha smesso...." ("When Girolamo quitted...."), located in Milan, starts with the discourse of what seems like an omniscient narrator. However, the reader must soon reconsider: not only is the narrator a character, speaking in the first person, but he also seems to be taking his knowledge from other people, about which no information is provided. Thus, after picturing the work of the cleaning company "Confidenza" ("Confidence"), and after a parodical commendation of Milan, the narrator reports the company's failure by inserting numerous fragments of direct speech and concluding: "[C]osì mi garantivano, e mi garantiscono ancora oggi, all'Ufficio Sviluppo della mia banca" (*RR* 1:309).¹⁵ This sudden refocusing, occurring only once the story is already developed, is repeated without fail in all the Milan pieces. In "Claudio disimpara a vivere" the protagonist's actions, which until then seemed precisely depicted in zero focalisation, are abruptly reconducted to "quanto mi riferirono poi le

¹⁵ "So they used to assure me, and assure me still today, at my bank's Development Office."

signorine Della Gerla” (*RR* 1:347), and even doubted: “Claudio alzò le spalle, sostengono le due ragazze: gesto che non gli vidi usar mai” (348).¹⁶ Even more interestingly, in “I ritagli di tempo” (“The Spare Moments”) the readers find that “[l]’autore stesso di queste note è convinto di essere cugino dei Caviggioni” (414),¹⁷ so that the narrator (ceremoniously speaking of himself in the third person) clarifies his role as a writer, while inserting himself in the hypercomplex system of Milan’s notable families which he is describing by way of comical exaggeration. Finally, in “L’Adalgisa,” the conclusive piece after which the collection is named, the narrator appears openly, literally stealing the stage to the homonymous protagonist. Until then, a conversation between Adalgisa and Elsa (her sister-in-law) had proceeded with a variable internal focus between the two, in a style that, as everywhere, mixed free indirect speech with various direct fragments, especially terms in Milanese, and lines of dialogue in direct speech. As Adalgisa is about to tell the story of how she met her departed husband Carlo, the narrator, for the first and last time, enters the flashback in person, with his own unveiled point of view. He does so by using the first person, readjusting the style to a higher tone (one similar to “Notte di luna,” which was however in pure zero focalisation), and most of all by showing his sexual attraction towards the then young protagonist. Here is a sample:

Aveva poi degli occhi limpidissimi, d’un azzurro infantile, con l’iride d’un color castano-nero, dorato, d’oro nero.... che occhi, Dio mio!.... per quanto a volte vi trascorresse come un lampo di gioconda e spregiudicata malizia: o addirittura di furberia. E si posavano talora sopra di noi, stupendi, quietandosi, e quietandoci, come in una gioia vivificatrice. Il caldo ardore del vivere pareva consegnato alle cose, alle torri: si placava nei gelati. (529)¹⁸

¹⁶ “According to what the Della Gerla ladies told me”; “Claudio shrugged, so tell the two ladies, a gesture that I have never seen him use.”

¹⁷ “The author of these notes himself is certain to be a cousin of the Caviggionis.”

¹⁸ “She had moreover the clearest eyes, of a childish light blue, with the iris of a chestnut brown-black, golden, of golden black.... such eyes, my God!.... although at times some flash of carefree and unconventional cunning passed in them: or even of craftiness. And they rested on us on occasion, splendid, quietening down and quietening us, as in a life-giving gaiety. The heated fervour of living seemed delivered to the objects, to the towers: it appeared in the ice-creams.”

The importance of this refocusing resides in its duration: it is not a single phrase or paragraph, like elsewhere, but a few pages. The passage back to the mixed form, to the private events of Adalgisa's life and their direct or fragmented speech, happens gradually while Carlo (who will eventually marry her) takes the narrator's place by overriding his desire for her: the flashback's last part, as the narrator specifies, is taken from Carlo's report.

This final apparition dispels every doubt: not only is the narrator a character of the storyworld, but he is also participating in the events, with emotions that cannot be limited to pure satirical disdain. He is also not just a reporter, but the story's writer. Yet above all, he is receiving some, most, or all the information from the network of rumours generated by largely unspecified people (plus some recognisable characters) whose voices he incorporates. If the use of rumours to pass unflattering intel on someone seems linked to the well-known *rumores* of Tacitus' historiography,¹⁹ *L'Adalgisa's* narrator undermines such practice, through frequent attacks against the absolute certainty that the Milanese society gives to its own ideas, its idols.²⁰ The narrator's discourse is thus compromised by being explicitly made, at least in part, from their perspective and gossip. In this sense, the beginning of "Quando il Girolamo ha smesso...." can be considered as a *myse en abyme* of the entire collection. The workers of the "Confidenza" are depicted moving all the furniture of a bourgeois house in order to clean the parquet floor. They reorganise "gli ingredienti e gli aggeggi della prudenza e della demenza domestica: dapprima scaravoltati gambe all'aria, poi simultanati, razionalizzati in una nuova e capovolta ragione, in una nuova e mirabile, per quanto imprevedibile, sintassi" (301).²¹ As we will

¹⁹ Tacitean *rumores* are today considered a typical rhetorical device for the author's characterisation of historical figures. Moreover, they have also been interpreted as actual causes, in the form of popular belief, for certain events: see, e.g., Gibson (1998).

²⁰ An example being the non-existent adulterous relationship between two characters, Elsa and Valerio, whose false report is spread by Madam Eleonora Vigoni, the decrepit matriarch at the centre of the main Milanese families' system. See *RR* 1:489-91.

²¹ "The ingredients and the contraptions of domestic prudence and dementia: initially swung upside down, then simultanised, rationalised in a new and capsized reason, in a new and admirable, if unpredictable, syntax." Simultanised is a Gaddian neologism for "put together at the same time" jokingly taken from the Futurist concept of simultaneity between impression and verbal expression. See *Italia* (1998, 243).

see in depth, the house represents in *L'Adalgisa* the identity and the mind-content of the middle class. The workers are thus doing to their customers' furniture what the narrator is doing to their convictions: capsizing it to see it in a different light, showing the dust behind the façade. But the cleaning company, like most characters, has also a *nomen omen*: "Confidenza," like the English "confidence," can mean both assurance and secret chitchat; both the satirised object and the method used to portray it.

A very similar mechanism is enacted in the Maradagàlian storyworld: the two stories related to it, told by a heterodiegetic narrator who is heavily compromised by free indirect speech, have in fact specular points of view. "Strane dicerie" introduces the figure of Gonzalo Pirobutirro, the protagonist, through the distorting collective lens of the peasants, who share exaggerated stories about his vices, and particularly his gluttony. "Navi approdano" is instead focused on Gonzalo and his delirious representation of the Maradagàlian society boasting at the cafes and Odeons, each sure of their infallibility, facing life "a culo indietro" (431).²² In both cases, as in the Milan stories, the specification that what is being told is the characters' belief is often postponed, or isolated in brackets: the narrator is not strong enough to keep a firm identity, and its referents are clearly not to be trusted. It is what Marie-Laure Ryan would define an "unknowable centre" in the relations between the characters' actual world and their private alternative possible worlds (1991, 40).

L'Adalgisa, then, forces the readers to continually refocus the position of the storyworld's narrative authority, devaluing it and revaluing it at every passage, and acknowledging the impossibility of an absolute point of view. As Cesare Segre (1985) affirmed, this style can be explained theoretically through the concept of polyphony, which Michail Bakhtin was developing around the same years. However, Gadda's ideas on narrative point of view seem to come directly from his reflections on physics, and special relativity in particular. It suffices to read his *Racconto italiano di ignoto del novecento*, where, apart from the unfinished novel, he collected several

²² "Ass behind [i.e. going backwards]."

reflections on fiction-writing. In September 1924, Gadda considered the possibilities of both a narration “*ab exteriore*” and “*ab interiore*” – roughly an omniscient or internal focus – and how they can be combined to create more variation. In particular, he was interested in what he terms the moments of knowledge, i.e., in the fact that knowledge changes with time and with the person, and that no particular moment is more important than the others. In the summary, he explicitly mentioned relativity: “Comunque: relatività dei momenti, polarità della conoscenza, nessun momento è assoluto, ciascuno è un *sistema di coordinate da riferirsi ad altro sistema, ecc.*” (SVP 473).²³ Science works, once again, to help demolishing human overconfidence: its value extends from reality to fictional creation.²⁴ In this sense, it is interesting to notice that, at least on that date, Gadda put together what today’s narratology classifies as the narrator and the empirical author, and derived narrative authority from real-life reliability (473-83). Between *Il fulmine sul 220* and *L’Adalgisa*,²⁵ the narrator’s presence became but one voice in the cacophony. Still, the shadow of the author is all but dissipated: its presence lurks in the notes.

I have already anticipated that the notes are written mostly for the collection. While in the first version of the *Fulmine sul 220* (1932) Gadda planned to attribute them to a fictional and pedantic Prof. Severino Diligenti, in *L’Adalgisa* the author directly takes the role. Even if he never specifies his identity plainly (and, importantly, neither does the narrator), he still quotes other works that he actually published before – e.g.: “Vedi: «Una mattinata ai macelli», di penna dello scrivente” (RR 1:331, n.5).²⁶ He also refers to some pieces’ earlier publication with various excuses: for example, he specifies when a certain episode (the story of how Carlo finds an exemplar of *Ateuchus sacer*) was written (1934) and first published (1941), with the excuse of wanting to avoid accusations of

²³ “Anyway: relativity of the situations, polarity of knowledge, no situation is absolute, each is *a system of coordinates to be referred to another system*, and so on.”

²⁴ I should note in passing that this has nothing to do with a postmodern fallback to language as an all-encompassing medium, but with empirical experience to which literature, as a rule for Gadda, had to comply as much as possible.

²⁵ See 198, n. 13 in this chapter.

²⁶ “See: «A morning at the slaughterhouses» from the pen of the writer [literally: the one who is writing here].”

plagiarism from another novel, Riccardo Bacchelli's *Il Fiore della Mirabilis* ("The Flower of the Mirabilis") (560-61, n. 18). Important sidestep: in the same passage he defines Carlo as "mio personaggio" (561; my emphasis).²⁷ At the same time, he repeatedly specifies that the notes were written in 1943, in fact confining his point of view to a limited frame of reference from which he is looking at the storyworld. Throughout the text, the author-annotator delves into historical matters (ex. on Napoleon, in no less than six pages: 331-36, n.10), linguistic panoramas (such as the terms used for breakfast in French, English, Spanish, German and various parts of Italy: 421-22, n. 16), scientific detours (from physics, biology and chemistry to geology and crystallography, without skimping on mathematical formulas often incomprehensible to the layperson), and baroque commentary. This gives a sense of intimate connection between all the storyworld's elements (as digressions tend to call digressions, apparently *ad libitum*): it also gives depth to the world, making it more complete while suggesting the impossibility to embrace it all. It is, in a sense, a playing with its limits, a stretching without an end that loses itself in the sheer mass of elements.

The final product is a complex encyclopaedia, one that literally cannot close the circle. This has direct repercussions on the storyworld's boundaries, as its connections end up latching it to the actual world. Not only is the narrated world described as the actual Milan of the past, not only is it historically profound and deeply interconnected, but the author-annotator is continuously jumping from one ontological side to the other. While some notes are used to describe events specific to the storyworld (the fictional time is usually given in note, as sometimes clarifications requiring flashbacks or further explanations), others declare the author-annotator's involvement with objects and people that are also present in the actual world: in "Quando il Girolamo," for example, the author's sensorial experience of a certain book in the story is comically described: "Il titolo è stato modificato dal vero nella sua parte onomastica. L'opera tuttodi esiste alla Biblioteca Nazionale Centrale di Firenze, e lo scrivente l'ha ivi palpata e annusata con estremo suo diletto, e profitto" (339,

²⁷ "[M]y character" (My emphasis).

n. 17).²⁸ Indeed, while the author assures the readers of the book's actual existence, he does *not* want them to understand of what book he is talking about²⁹. The same goes for other cases: the entire "Claudio disimpara a vivere" is defined as an "elzeviro" (a short art prose) which "adombra un più drammatico e anzi addirittura ferale mancamento di ponte verificatosi negli anni tra il 1920 e il 1930" (RR 1:351).³⁰

As Cenati wrote, "le note costituiscono al contempo un fattore di identificazione tra voce narrante e autore reale . . . Se le note conferiscono verosimiglianza al racconto con la loro valenza di autenticazione oggettiva, all'inverso il racconto getta su di esse un brivido di invenzione immaginaria" (2010, 65-66).³¹ I would, however, stress the first effect over the second, which points to the motivations behind the technique: to make the reader suspect that, behind the fictional characters, objects, and events of the storyworld, the author is hiding their actual counterparts.³² How far are we to take this supposition? If we take it as far as possible, should we believe that the text asks to be read as a disguised autobiography, as the result of a self-defence mechanism? The elements listed up to now – the annotator taking narrative roles, or referring to the fictional world as actual; the narrator defining himself as a writer; and notably the most particular style that the two figures share – lead us to say yes. Most importantly, if we accept the deliberate porosity between story and notes, then the two share equal value for the interpretation. At least, this is the game behind *L'Adalgisa*. In

²⁸ "The title has been modified from the truth in its onomastic part. The work exists all this while at the Central National Library of Florence, and the writer has palped it and sniffed it yonder with extreme delight, and gain, of his."

²⁹ Similar processes, with an extra layer, happen in the Maradagàlian storyworld. For example, a particular edifice is said in note to be existing "nella reale realtà, in riva, quasi, d'un bel lago della provincia di Novara" ("in real reality, on the shore, or almost so, of a nice lake of Novara's province.") RR 1:404, n. 4.

³⁰ "[V]eils a more dramatic, and in fact woeful, foundering of a bridge occurred in the years between 1920 and 1930."

³¹ "[T]he notes constitute at the same time a factor of identification between narrative voice and real author . . . If the notes confer verisimilitude to the story with their worth of objective identification, the story conversely provokes in them the thrill of imaginary invention."

³² And in fact, few Gaddian critics resist the temptation to try to pinpoint who is hiding behind this or that character, with a frequency rarely seen for other writers.

Genettian terms, Gadda is playing with his authorial notes, leaving uncertain if the annotator is authentic or fictive (see Genette 1997, ch. 12). To use other words, consider what Marie-Laure Ryan writes:

Fictional universes always differ through at least one property from our own system of reality: even if the sender of the fictional text recenters the textual universe around a world TRW [Textual Reference World] in which everything is supposed to be exactly the way it is in AW [Actual World], TRW differs from AW in that the intent and act of producing a fiction is a fact of AW but not of TRW. (1991, 33)

Gadda's technique begs exactly this question, making us doubt that narrator and annotator share the same identity, either in the same storyworld, or, more probably, in the actual world, so that the book that the narrator declares to be writing and the one we have in hand end up being the same. Hence, the identity of the mass of characters is compromised, as they could either mimic or faithfully represent actual people. The hint that they might be invented counterparts of real people paradoxically strengthens their nonfictionality, suggesting that they are even closer to their actual world counterparts than the fictional counterparts of historical figures identified by the same proper name.³³ Once recognised, name-hiding strengthens the trans-world relations between characters and actual versions, even if the actual name is not revealed. We should also remember, however, that all propositions about characters and states of affairs of *L'Adalgisa* are distorted by the rumour mill that

³³ Against a discrimination of real and fictional entities within a fictional narrative, fictional worlds theory generally recognises that historical characters in fiction (along with places and, I would add, other unique elements such as artworks) pertain to their own fictional world, enjoying the same ontological status of all other entities that are present only there, and not in the inventory of the actual world (see for ex. Ryan 1991, 61-67; Ronen 1994, 122-30; Doležel 1998, 16-18). To put it in Doležel's words, "[t]he principle of ontological homogeneity is a necessary condition for the coexistence, interaction, and communication of fictional persons" (18). Even though historical characters in fiction share the same "rigid designator" in the form of proper name with their actual counterparts, they are not bound to have their same properties. If we start from such a logic, we can say that Gadda's narrator seems to be changing the rigid designators to hide the owners of discreditable properties, thus hinting that such properties (and their possessors) are true in the actual world. See Pavel (1986, 31-41) and Ronen (1994, 130-36) for summaries on naming theories and names as rigid designators, and the extension of the latter (first made by Pavel himself) to fictional entities.

constitutes the events' main medium, coming from the characters themselves, their false beliefs, their hallucinations, and the author's disparaging look. Even if their inner feelings are described, we cannot be sure of where those feelings are coming from: ontology is inevitably and indistinguishably mixed with its representation. The satirical and comic style, the lists and exaggerations, the distortions, along with the set of hints I just described, all serve the final purpose of showing that "baroque is the [actual] world" in the true sense of the word. Still, there is a sense to be looked for in the chaos, even if not assuredly to be found. What counts the most are not the single points of view in themselves, but their independent (objective) relations with each other: that is, their *covariant properties*.

Shape and deformation

To Gadda, searching for covariant properties could mean two things: in a conservative sense, it would be acknowledging the datum, the briefly stable element in the general deformation of all systems; in a heuristic sense, it would mean finding previously unknown wider relations between systems: that is, a system $n+1$ (this too temporarily stable). Gadda's narrative can be interpreted as working mainly in this second direction, making heuresis an objective that the reader can achieve by reflecting on the text. In *L'Adalgisa* (at least) I find a local and a general heuresis: the first is so clear that it can go unnoticed, while the second is the result of putting together the scattered pieces in the collection. As in Tacitean historiography, the ethic message is entrusted mainly to the *pars destruens* of the satirical discourse. Mental imagery, as we will see, plays an important role in that, especially in the visualisation of spacetime's structures emerging from general relativity theory.

I will just give a quick example of the first mode. It takes the form of variations of iterative discourse, obtained by refusing to clearly define the setting, or by offering glimpses of perspectives that are immediately withdrawn. In "Quando il Girolamo," for example, the narrator viciously takes his time to describe the conversations between the rich old women and the workers of the "Confidenza," "[q]uesti Eligi, Anselmi, Umberti, o Girolami, «di cui ci si poteva pienamente fidare»"

(RR 1:304).³⁴ The reader is forced to acknowledge the old ladies' libidinous expectation, masked behind the appearance of a recurring dread: the theft of their precious earrings by a "lók" (Milanese for delinquent). The fact that the conversations follow a common pattern, and repeat in different settings at different times, is suggested by the occasional abrupt change of the interlocutors' names within the same dialogue. Who is talking, when and where, like mathematical variables, are not important factors. What counts is only what can be derived from their chatting as common to all: the syntax of the equation. Another example is the timeless and placeless hallucinated description of the "Odèons" and the "restaurants" pictured through the distorted focus of Gonzalo in "Navi approdano al Parapagà" (RR 1:430 ff.), a list drawn in expressionist style of people drinking and eating. So long and confused is it, and so deformed are its components, that the sparse deictic information loses all sense: it is impossible to discern how much of what is happening in Gonzalo's head is at least plausible. What is discernible between the lines, however, is the expression portraying the relationships between the protagonist and the society around him.

The second mode is more interesting: certain images and events are recurrent throughout the stories: they reappear in unexpected places, forcing apparently abstruse links that suggest a bigger picture. As Valentino Baldi wrote, Gadda builds a "universo letterario ad alta densità paranoide" (2019, 27)³⁵ where all is linked (thus everyone is guilty of everything) and thought and action seem to have equal ontological value. If the readers accept his storyworld, they are forced to take this same mode of interpretation. After all, on top of all the systems there is just one: unreachable and unknowable, in continuous deformation. The very fact of existing brings a little change to everything, for good or for bad. Moreover, as Gadda explains in the *Meditazione milanese*, every time a non-existent link is even just imagined, evil ensues (see *SVP* 681-97, and ch. 1.4, 106). In the next section, I will argue that, at its (subatomic) core, this apparently paranoid character of reality is, or becomes

³⁴ "[T]hese Eligios, Anselmos, Umbertos, or Girolamos, «who could be completely trusted»."

³⁵ "[H]igh-density paranoid literary universe."

in the course of Gadda's reflections, inherently quantum mechanical.³⁶ However, when it comes to understanding the phenomenon in its general character, it is to the search of covariances that we have to turn. This is where the framework of general relativity, which supplies a general rule for deformation, comes into play.

I have already mentioned the link between ego, electricity, and gravitation in Gadda's works around the end of the war.³⁷ This link plays a part in *L'Adalgisa* as well, declined in terms of reality's reaction to idols (i.e. false links forced on the system). However, since the text is the result of a stratification lasting for years, the theme has some variations. Gadda read Freud's *Group Psychology and the Analysis of the Ego* only in 1942, thus after he had completed the second version of *Un fulmine sul 220* (1934), but he had been interested in psychoanalysis since at least the 1930s (see ch. 1.4, 113). In addition, already active since the *Meditazione milanese* (and often recurring) was the analogy between the certainty of one's absolute centrality of perspective and the belief in a Ptolemaic system (see e.g. *SVP* 825, n. 1). By the time of *La cognizione del dolore* (1938-41), from which "Strane dicerie" and "Navi approdano" derive, Freud's psychoanalysis had taken a pivotal (if tormented) role, as Ferdinando Amigoni assessed (1995, 11). Moreover, even within the five texts deriving from *Un fulmine sul 220* there are various tell-tale variants (usually additions) appearing in their following versions in literary journals at the beginning of the '40s, or directly in the collection, which go in the direction of the ego-physics collision, especially with regards to gravitation: I will highlight some in the notes to the examples that will follow. It seems therefore very probable that Gadda updated the stories through his own physical psychology in view of the publication of the volume.

Another fundamental element is the interconnection, in Gadda's middle-class characters, between house and ego, resulting from a Freudian introjection of the former. The recurrent trope has been noticed by Federico Bertoni: "La casa è una proiezione topografica, un'espansione

³⁶ See chapter 3.4, 334 ff.

³⁷ See chapter 1.4, 118 ff.

compiutamente spazializzata del sé, e come tale partecipa delle stesse paure e ossessioni che minacciano l'identità dell'individuo" (2001, 262).³⁸ This parallel is not simply a way of enlarging the relations between the inside and the outside: it establishes a polar connection between the two domains, in which any action (and conviction) of the one has repercussions on the other, and vice versa. Moreover, by building, and accurately describing, literal (and literary) walls, floors, and ceilings, Gadda gives the readers, who recentre themselves in his comically confusing storyworlds, the means to acknowledge borders, to establish visual units of measure. These elements set a perceptible frame and become imaginative catalysers. To give a first example, the beginning of "Strane dicerie" is dedicated to the description of the Maradagàlian houses and villas around the area of Lukones (the counterpart of Longone, near Como Lake). These are defined as "politecnicali prodotti" (*RR* 1:381),³⁹ i.e., the result of the mentality of the Polytechnic University (or, rather, its fictional counterpart), which throughout the collection will repeatedly appear as the institution perpetuating and protecting the main Milanese (and Maradagàlian) rationalist and anthropocentric ideals.⁴⁰ The results, however, tend towards the most absurd shapes. After a few examples, the narrator stops at "Villa Maria Giuseppina," property of Mr. Bertoloni, which features two towers with two lightning rods. Phallic symbols *par excellence*, protruding over the humbler confining villas to suggest the superiority of their owner's sexual prowess, the rods end up arousing the "«lubido» celeste" (385):⁴¹ three lightnings in more or less three years. Instead of working properly, the rods redirect the shocks to the villa and its neighbours, in a succession of weird and apparently unnatural movements (including, at a certain point, a globular lightning) that the technicians will not be able to make sense of. The detailed narration of the lightning strikes plays around the semantic repertoires

³⁸ "The house is a topographic projection, an effectively spatialised expansion of the self, and as such it partakes of the same fears and obsessions which threaten the identity of the individual."

³⁹ "Polytechnical products."

⁴⁰ For a summary of the main references to the Polytechnic in Gadda's work (with particular attention to their real-life counterparts), see Silvestri (2006).

⁴¹ "Celestial 'lubido.'"

of divine punishment against human *hybris*, technical explanation in comic style, and male exhibitionism. Crowning the final strike's absurdity is the subsequent apparition of the ghost of a poet who had died in the villa some time before, an electric presence changing its brightness "come una lampada termoionica" (388)⁴² while haunting the house and repeating apparently meaningless actions. The readers are thus faced with a world thrown in tragicomic chaos by its inhabitants, who are in fact causing nature's reaction by modifying space according to their (electrically) overloaded narcissistic ego.

If narcissism is instead connected to gravitation, general relativity guides the events. As discussed at the beginning of this chapter, the kind of link one postulates between geometry and reality reflects a certain take on the equivalence between thought and world. In the Milan-based stories, Euclidean geometry, as a Kantian *a priori* category, becomes the banner of such equivalence in the Polytechnic university's creed, the institution that most represents Milanese society's idols. It is interesting that, at least to my knowledge, the only critic who considered this issue is an architect: according to Rossella Salerno, the frequent Gaddian attacks against Milanese engineers and architects are caused by the restrictively operative teachings of the institution, making it a "luogo in cui è dato assistere alla separazione tra scienza e tecnica, dunque tra conoscere e agire" (2000, 112).⁴³ To this exclusively Euclidean descriptive approach, Salerno opposes Felix Klein's contemporary "Erlangen Program," with its inclusive vision of the different geometries. Still, I would say that this narrow pragmatism is a consequence of the delusion of being able to make reality's rules equivalent to the mind's. It is, to use the words of the old matriarch Donna Eleonora Vigoni, the conviction that "lo spirito deve dominare la materia" (*RR* 1:487): the phrase, bearing Mussolini's copyright, described

⁴² "[I]like a thermionic lamp."

⁴³ "[P]lace in which it is given to assist to the separation between science and technique, therefore between knowing and acting."

in fact the illusion of an era.⁴⁴ General relativity's non-Euclidean geometry is directly opposed to this view, as matter changes the spacetime around it. The point is that the ego, in Gadda's storyworld, bears the same potential.

This becomes clear in "Quattro figlie ebbe e ciascuna regina," a tale centred on a high-class family, the De' Marpionis, striving, after three daughters, to have the most-yearned male heir.⁴⁵ The beginning shows us the family's head, the "Nobilis Homo Cipriano de' Marpioni" renovating his house according to the Polytechnical precepts, by employing the work of the "Grand'Ufficiale Dottor Ingegnere Odoardo Forlina," who orders all kinds of modifications and additions. The first and most specific element on which Gadda focuses our attention are the hexagonal tiles that cover part of the house's floor:

Com'era l'uso in Milano fra il 1890 e il 1910, l'apotema di quelle mattonelle misurava centimetri 5,196: mentrech  il raggio del circolo circoscritto raggiungeva i 60 millimetri: le due misure sono interdipendenti, per il che non occorre aver noi alcuna notizia di trigonometria, ma ci pensa il cervello stesso dell'esagono.
(355)⁴⁶

Right away, we are confronted with a regular unit of measure to imagine the house: the hexagons. As clear from the comically precise description, Euclidian geometry should come as an assurance of structure, regularity, and perfect (or rather maniacal) control of space. In fact, however, the renovation is an utter failure, worsened by the "culto tot mico del trapezio" (356)⁴⁷ that the architect honours in

⁴⁴ "The spirit must dominate the matter." It is probably not a case that the short story "Al parco, in una sera di maggio," when published in July 1943, ended abruptly a few lines before this phrase. See Gadda (1943); see also n. 50 in this chapter.

⁴⁵ The following analysis is developed from an initial sketch given in my master's thesis. See Giansiracusa 2019, 83-85.

⁴⁶ "As it was in use in Milan between 1890 and 1910, the apothem of those tiles measured centimetres 5.196: whereas the radius of the circumscribed circle reached 60 millimetres: the two measures are interdependent, for which reason no notion of trigonometry is needed, but the very brain of the hexagon does the job."

⁴⁷ "[T]otemic cult of the trapezoid."

building the walls. The house becomes a series of “impreveduti scalini e repentini mutamenti di livelletta, a non contare le svolte nel buio, gli scivoli, le buche, i bernoccoli, e intoppi e inciampi d’ogni maniera e d’ogni calibro” (356).⁴⁸ The tiles, especially, are often loose, and people are always at risk of stumbling: which is what the old servant and the two older de’ Marpioni girls do all the time. For Giulia, Cipriano’s wife, a champion of self-assurance whose senses only register the trips of the former, each fall is a “mancanza di riguardo . . . al Politecnico, al senator Colombo” (362).⁴⁹ As for the third daughter, Maria Giuseppa (Mapeppa for friends), three years old, her relation to the tiles takes the form of more substantial “pisce fulminanti” (357).⁵⁰ The apartment, true protagonist of the first part of the story, is transformed into a monster by way of metaphorical cumulation from different fields: the readers are forced to see it as the viscera and organs of a human body (as alive as its possessors), an electric circuit, whose sparkling charges are Donna Giulia’s desires, but most of all a gravitational mess caused by the family members. Mapeppa, for example, is the centre of attention of dozens of female visitors who come to the house to adore her like a pagan idol, the price to pay for the inclusion in the quasi-mafia family system: “dopo qualche prima incertezza gravitazionale sui più timorati esagoni d’anticamera, (indi gabinetti), erano oggimai pervenute a

⁴⁸ “[U]nforeseen steps and subitaneous mutations of gradient, not counting the turns into the dark, the slips, the holes, the lumps, and hitches and glitches of every sort and calibre.”

⁴⁹ “[L]ack of regard ... to the Polytechnic, to Senator Colombo [the headmaster].”

⁵⁰ “[F]ulminating pisses.” Excretions in Gadda are often depicted as the answer of reality to any attempt of idealistically categorising it through pure ideas. An example, where the same adjective appears, along with the notorious phrase, can be found in the 1950 essay “Come lavoro,” collected in *I viaggi la morte*. It is the description of Mussolini’s arrest in July 1943: “«Lo spirito vince la materia!» sosteneva Pirgopolinice, il mistico. Ciò non accadde nell’autolettiga dei reali. Prestando ad altro il suo genio, si pensò, il nostro Pirgo, lo rotolassero diffilato al muro al flik-flik. Non proferì parola. Con decisione fulminea, «degnà di Napoleone», evacuò se stesso, il meglio di se stesso, nella coartata capienza delle disportive brachettine . . . La mistica materia, in quella contingenza, vinse lo spirito, nonché lo stomaco dei carabinieri.” (“‘Spirit wins over matter!’ sustained Pyrgopolynices, the mystic. That did not happen in the ambulance of the royals [the royal guards]. Lending his genius to other matters, he reckoned, our Pirgo, that they were rolling him directly to the wall for the flik-flik. He did not utter word. With fulminating decision, ‘worthy of Napoleon,’ he evacuated himself, the best of himself, in the coarcted capacity of his little sports pants . . . The mystical matter, in that contingency, won over the spirit, and over the stomach of the carabinieri”); *SGF* 1:434).

orbitare con regolarità copernicana nel proliferante piano dell'eclittica demarpionica” (359).⁵¹

Another orbit over the tiles is that of the three daughters around their father each time he comes back: described as a “girotondo infernale” (363),⁵² their dance causes the downstairs neighbours’ ceiling to crumble a little more every day.

Those broken, dirty, unstable tiles compose the fundamental units of measure of a gravitational spacetime image: they make space not only visible, but divisible. Ideally, the tiles should all be the same, yet each reveals a trap. Only husband and wife seem immune to their curse, and refuse to acknowledge it. There is a strong resemblance between this parodical description and one of Einstein’s pedagogical thought experiments, described in his popularisation, which Gadda possessed. In order to explain that spacetime in a gravitational field is a non-Euclidian continuum, thus preventing the observer to define its points through Cartesian coordinates, Einstein asks the readers to imagine a marble slab. Having a number of equal rods at their disposal, the observers could divide the slab by forming with them equal squares throughout the whole surface. If the operation succeeds (viz., if the slabs’ borders are such that the squares come out regular), the result is a Euclidian continuum: it is possible to move from each point of intersection to the other “without executing ‘jumps’” (Einstein 1920, 98), and every point can be described through coordinates by using the rods’ length as a unit of measure. Yet, Einstein explains, the situation changes if the slab is heated at the centre, so that the rods on it deform while the ones on the periphery do not. Supposing, with a stretch of imagination, that “rods of every kind (i.e. of every material) were to behave in the same way as regards the influence of temperature when they are on the variably heated marble slab” (101), there will be no possibility of understanding the slab’s measures within the framework of Euclidian

⁵¹ “[A]fter some initial gravitational hesitation on the most conscientious hexagons of the antechamber (then bathrooms), they had by then succeeded in orbiting with Copernican regularity in the proliferating plane of the Demarpionic ecliptic.”

⁵² “[I]nfernal ring a ring o’ roses.”

geometry. This paves the way to the explanation of multi-dimensional non-Euclidian coordinates as imagined by Gauss, paramount to the description of a gravitational field.

It is easy to see the symmetry: Einstein, to explain a situation which seems to defy common sense, recurs to concrete elements, marble and heat, to describe space and gravitation; Gadda, in turn, alienates something as simple as a tiled floor through metaphors and scenes linked to gravitational fields. The point, though, is that his narcissistic characters, with their imposition of biased rules to reality, are the actual cause of the deformation. Such blindness results in a *literal* misstep. Cipriano and Giulia, then, act like overloaded masses: not only they are described as actually enormous, but their narcissistic energy twists the world around them.⁵³

Why hexagons? As Einstein too would have known, regular adjacent hexagons are the geometrical figures that can fill the largest possible surface with a given perimeter, leaving no void space in between them. It is one of those rules that seem to pertain to the total system, as they can be applied to everything, from geology to engineering. No wonder Gadda would be attracted by it. Studying his autograph notes on Leibniz's *Nouveaux Essais*, Guido Lucchini highlighted how Gadda saw a "segreto ordine" contained in "Ogni discorso, ogni immagine o concetto o giudizio, in genere ogni composizione (poema)"; the idea came from a "teoria embrionale sulla "fatalità" spaziale e geometrica dell'ordine cristallografico, balenatami nel vedere la sezione esagona d'un cavo in costruzione per il ponte di Philadelphia sul Delaware nella Zeitschrift der deutschen Ingenieure" (From the "Quaderno climaterico," cc. 65-66, qtd. in Lucchini 2000).⁵⁴ At the same time, as should now be clear, in *L'Adalgisa* "ogni più nobile schema nella imperfettibilità del mondo si avvera e

⁵³ In fact, Giulia is also parodically slowing time: her visit to the fabric store, in search for a cloth of a specific kind of green, forces the desperate clerks to look for every possible shade without ever finding it (maybe due to gravitational redshift?), while outside life continues, and everyone is going to lunch. See *RR* 1:365-68.

⁵⁴ "[S]ecret order" contained in "every discourse, every image or concept or judgement, in general every composition (poem)"; "embryonal theory on spatial and geometrical 'fatality' of the crystallographic order, flashed into my mind in seeing the hexagonal section of a construction cable for the Philadelphia Bridge in Delaware, on the *Zeitschrift der deutschen Ingenieure*."

perfeziona carinandosi . . . come il corpo, andando, si accompagna del peso (gravame)” (RR 1:416).⁵⁵

For now, let us store in the mind the hexagonal shape, and follow the question of weight and its consequences.

Once one builds the connection between gravity, egocentrism, and deformation, *L'Adalgisa* starts revealing its underlying system. In a city thrown into chaos by an urbanistic restructuring, characters orbit around each other, attracted by beauty or power; they act as centres or satellites of families' networks. Yet, gravity constantly punishes their blind confidence, and what falls under their influence. For example, the horse of Donna Eleonora Vigoni, the aforementioned defender of the “spirit,” is described in “Al parco” as a ramshackle beast pulling her coach (a movable section of her house?) through the traffic's “tolemaica girogiostrotta” (484):⁵⁶ its hoofs are “stromenti satanici della gravità” (483).⁵⁷ The poor animal is even linguistically deformed by Donna Eleonora's extreme narcissistic energy: the style of its description is overcharged, mixing the opposite hyperbolic semantic fields of actual present decrepitude and supposed past knightly sturdiness, with even long notes on the topic of the horse in heraldic, baroque and grotesque paintings.⁵⁸ Many equines from different timeframes are all colliding onto one. But most of all, and differently from its owner, this horse placidly surrenders to the laws of nature: its back is described as forming a “catenaria,” the figure taken by a suspended chain under gravity's influence, as is explained in a long note featuring the formulas of its function (483).⁵⁹ What Gadda leaves to the reader's interpretation is that the catenary curve is an example of physical minimum: at every point, its potential energy is the least

⁵⁵ “Each most noble scheme, in the imperfectibility of the world actualises and perfects itself degrading ... as the body, going, is accompanied by the weight (gravamen).” I translated “gravame” as “gravamen” to highlight the etymological affinity with gravity. Important note: in *Un fulmine sul 220*, the last part of the phrase, relative to body and weight, does not appear: see Gadda 2000, 100.

⁵⁶ “Ptolemaic merry-go-round.”

⁵⁷ “[S]atanical instruments of gravity.”

⁵⁸ See RR 1:483-85; as well as 504-6 n. 4 and 6.

⁵⁹ “[C]atenary curve.” See also RR 1:502-3, n. 1. It should be noticed, again importantly, that, while the metaphor of the “Ptolemaic merry-go-round” was already present in the *Fulmine*, the reference to the catenary curve, its note, and the other references to gravity are later additions. See Gadda (2000, 127).

possible. It is thus the optimal configuration, minimising the fatigue despite the desperate situation.

The analogy/opposition between animals and humans is at its strongest in “L’Adalgisa,” building links with all the other narratives. A good part of the story orbits around Carlo’s entomological interests. His house is full of scarabs, pinned on “foglio bianco a coordinate rettilinee” (520)⁶⁰ and preserved in display cases: it is the actualisation of his positivistic ideal, seeing knowledge as cumulation of data. His most precious specimen is the *Ateuchus Sacer*. The often-recalled tale of its capture, mediated by the alternating points of view of Adalgisa, the narrator, and Carlo, is a strongly visual narration of the insect, found on a Tuscany beach, on its way back to its lair, carrying the excrements’ ball in which its mate would plant the eggs. It is Carlo himself who builds the parallel between the ball and family savings, which the bourgeois ethics worships as the preservers of their children’s future. Still, the readers have more hints on their hands: the insect is described walking backwards, like the aforementioned Maradagàlian youngsters, but differently from them it has to surpass “i tenebrosi divieti della gravità” (523)⁶¹ to make its way over the beach’s dunes.⁶²

Even if that is the only moment in which the connection between insects and human beings is made explicit, the readers have now the key to interpret the rest of the tales. A little before, we find the tale of how Carlo fell (once again) into a lake while trying to catch a few exemplars of *Ditiscus* (great diving beetle) while the animals happily slid away. This opens a short digression on the insects’ evolution, leading them to a shape which encounters almost no resistance in the water, thus “raggiungendo il loro laborioso integrale isoperimetrico” (519).⁶³ The syntagm gives way to a one-

⁶⁰ “[W]hite sheet with rectilinear coordinates.”

⁶¹ “[G]ravity’s dark forbiddances.”

⁶² There might also be a hidden opposition between the religious idea of the scarab in ancient Egypt and the real creature. Adalgisa mentions that he used to be an “animale sacro” (“sacred animal”; *RR* 1:522), and stresses the difference between that belief and modern science, which, however, amounts for her to Carlo’s amateurish skills. If the readers might smile with the narrator at Adalgisa’s naivety, they might also remember that for the Egyptians the scarab was considered as the roller of the Sun around the Earth, a Ptolemaic idol parallel to the ideal that the Milanese bourgeoisie has of their position in the universe.

⁶³ “[R]eaching their laborious isoperimetric integral.”

and-a-half-page note dedicated to the explanation of the isoperimetric problems, that is (in brief) problems dedicated to finding the minimum or maximum result in the calculus of variations. Evolution has, little by little, led to the beetles' perfected form, solving a similar problem by trial and error. Among the examples, much space is dedicated to the instinctual technique used by bees in order to construct their beehives' hexagonal and trapezoidal cells by using the least possible amount of wax, and the history of how mathematicians calculated those exact angles as recounted in Maurice Maeterlinck *La vie des abeilles* ("The Life of the Bee"; see RR 1:558-59, n. 12). For Paola Italia, with this note and in general with his literature, Gadda was trying to show "[u]na realtà in cui il dato empirico conducesse, attraverso un metodo verificabile, a una legge scientifica che traduceva in segni discreti una fenomenologia naturale apparentemente casuale" (2016, 142),⁶⁴ thus putting order within the disorder. Yet, once the metaphorical meaning that we should apply to the note is accepted in its pure visual content, Gadda's system reveals a more ominous side: hexagons (and trapezoids) immediately call back to De Marpioni's house and its tiles. We return, once again, to the division and organisation of space through matter. While the bees' hexagons result from instinctual adaptation to the environment, an era-long capitulation to the datum and the acceptance of its instability,⁶⁵ the De Marpioni's tiles represent a detachment and a perversion caused by idealised and self-centred inexistent links in the system. Even the mathematical calculations that reveal the prevalence of an angle in the beehives are nothing but analyses made *a posteriori*. Deformation is the rule, and no escape can be provided but accepting it and adapting to it: becoming singular, recognising oneself as an individual that moves according to one's own rules, can only lead to defeat. Moreover, the parallel

⁶⁴ "A reality in which the empirical datum would lead, through a verifiable method, to a scientific law that translated an apparently casual natural phenomenology into discrete signs."

⁶⁵ In fact, Maeterlinck ([1901] 2006, 78), in the section on the structure of beehives, enthusiastically endorsed their adaptability: "Nor can we in such cases refrain from admiring the ingenious economy, the unerring, harmonious conviction, with which the bees will pass from the small to the large, from the large to the small; from perfect symmetry to, where unavoidable, its very reverse, returning to ideal regularity as soon as the laws of a live geometry will allow; and all the time not losing a cell, not suffering a single one of their numerous structures to be sacrificed, to be ridiculous, uncertain, or barbarous, or any section thereof to become unfit for use."

shows that even human actions are, if perverted, still based on the same patterns as insects. Despite the deep differences between bees and scarabs on the one hand, and humans on the other, deep down the latter are moved by the same secret instincts, desires, and physical forces: they are just trying to forget it. To unearth the connection, though, the only way is extending the link in space and time, over the centuries and the species. Uncannily, the analogy suggested by Carlo's last capture is also the bleakest: the *Necrophorus*, or burying beetle, living inside cadavers, feeding and mating within them. Similar is also the end of both Carlo's beetles and Milan's bourgeoisie: the former, arranged on graduated paper, are forgotten on the street and squashed by the movers' carriage after Carlo's death, each thus reduced to "la proiezione ortogonale della sua propria superbia" (*RR* 1:526).⁶⁶ The latter are put together in new shapes like the objects of their houses are rotated by the men of the "Confidenza" in "Quando il Girolamo,"⁶⁷ their arrogance reduced to the set of ink marks we are holding in our hands. It is, indeed, an imperfect representation, but is still the most that can be obtained.

To gravitation and psychoanalysis, we have added evolution: no piece can be isolated for a general description of reality. If in Gadda the tendency to *singula enumerare* leads to a dispersion of the common laws into bits, he still leaves the traces of the underlying scheme, to be reconstructed within his storyworld. As Raffaele Donnarumma aptly perceived, in Gadda causality is substituted by coexistence: "Gadda ... promuove l'infinità dalla geometria piana della linea alle «*n* dimensioni» di una geometria posteuclidea" (2006, 37).⁶⁸ But while Donnarumma, agreeing with Dombroski, saw *Un fulmine sul 220* and *L'Adalgisa* as special cases of Gadda's production, where spite for the subjects obliterated significance, I would argue that the search for common rules is here as active as

⁶⁶ "[T]he orthogonal projection of its own pride." The reference to pride (thus, laterally, to narcissism), is not in the *Fulmine*. See Gadda (2000, 157).

⁶⁷ Both the parts are highlighted by explicatory notes. In "Quando il Girolamo ha smesso," the moving of the objects is paralleled to figure rotation ("ribaltamento") in projective geometry, with a note explaining the word. Here, the term "orthogonal projection" is similarly clarified. See *RR* 1:301; 330, n. 3; 526; 561, n. 21.

⁶⁸ "Gadda ... promotes infinity from the plane geometry of the line to the «*n* dimensions» of a post-Euclidean geometry."

ever, if not more. The characters, then, are not as important in themselves as they are in their relations. Their existence, their ego and its manifestations, are all there to prove that deformation *is* the rule, that it is attached to existence and *must* be recognised every time improvement is attempted, to avoid going backwards to an *n-1* system. Einstein's relativity gives the perfect scheme for it, and obtains in return a means of visualisation that, if parodical – or *because* of its comic tangibility – becomes as vivid as ever.

SECTION 3

LITERATURE AND QUANTUM PHYSICS

A Brief Review of Quantum Theory

This first chapter is a basic historical and theoretical introduction of quantum theory, instrumental to better develop the literary analysis. Differently from section 1 and 2, the physics under scrutiny will be explained with sufficient precision to not require any previous knowledge on the topic.

We start with a thought experiment, courtesy of Richard Feynman:

We make an electron gun which consists of a tungsten wire heated by an electric current and surrounded by a metal box with a hole in it. If the wire is at a negative voltage with respect to the box, electrons emitted by the wire will be accelerated toward the walls and some will pass through the hole. All the electrons which come out of the gun will have (nearly) the same energy. In front of the gun is . . . a wall (just a thin metal plate) with two holes in it. Beyond the wall is another plate which will serve as a “backstop.” In front of the backstop we place a movable detector. The detector might be a geiger counter or, perhaps better, an electron multiplier, which is connected to a loudspeaker. (Feynman [1963] 2011, 122-23)

Since will is power, let us state that the gun can shoot the electrons one by one (so that they do not interfere with each other), and that the whole apparatus is fairly minuscule, whether that is actually feasible or not. Although we do not know the exact direction of each electron, we can use the movable detector (and a bit of calculation) to work out the number of hits on the backstop in each point and obtain a general probability curve. Firstly, we find out that the hitting electrons are always single: we never detect half an electron. Thus, we can conclude that each of them is an indivisible particle either

passing through the left slit or through the right slit (we can call them 1 and 2 for brevity's sake). The probability curve should thus be resulting from the sum of the two curves that would come out if we closed one or the other slit, a bell-shaped curve a bit higher towards the centre if the two slits are close enough.

What we find, instead, is that the electrons are concentrated in large bands, separated by others where almost no electron is detected, forming a striped pattern. Such is the typical interference pattern of two waves. They could very well be water waves resulting from a single one that passed through the two holes and split, and which either sum up or cancel each other. Granted, the mathematics to treat this case is still clear, just not the kind that we were expecting. What is this? If we leave only slit 1 open, there we have our expected particle-like pattern, a bell-shaped curve to the left; with only slit 2 open, there we have a bell-shaped curve to the right. We leave both open, and we end up with a wave made of single dots. But a wave is a *continuous* phenomenon. Should we conclude, then, that the electrons are not passing through either slit 1 or slit 2?

We can confirm this by using a light source close to the slits: in that way, we can identify each of our electrons through the flash they emit in passing. We find indeed that we were right in our first assumption: the flash is either to the right or to the left, and never in both positions. At the same time, though, our backdrop screen stops showing us an interference pattern: instead, we have what we expected at first, a centred bell-shaped curve for the total probability. The electrons seem to *know* that we are looking at them. Should this make us feel a bit uncomfortable? Let us repel the ghastly suspect that raw matter is somewhat sentient and consider the issue rationally. Thanks to Einstein, we know that light too is made of a kind of particles called photons. Indeed, if we diminish the light's intensity, thus shooting less photons, sometimes our electrons do not meet any of them and pass unobserved. We can conclude, then, that since photons have a certain momentum, by hitting the electrons they are deflecting their trajectory and changing their final position on the screen. We have been tampering with the experiment. Our last hope, then, is to lessen the impact by lessening the photon's momentum until we can both have the slit information and the electrons' correct final position. We can do that by

using a light with a lower frequency (a red light, for example). As the frequency gets lower and lower, however, the wavelength increases, until the light flash is so extended that we cannot say whether it came from slit 1 or 2. Then, *and only then*, do we find the interference pattern again. There is no way out of the impasse.

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I have summarised and simplified the famous double-slit experiment from one of Feynman's lectures ([1963] 2011, ch. 6). As he explains, it “has in it the heart of quantum mechanics. In reality, it contains the *only* mystery” (117). Indeed, it shows the working of Heisenberg's uncertainty principle, quantum superposition, and wave-particle duality.

Feynman's thought experiment was not the first. Heisenberg had showed his uncertainty principle in 1927 through the imaginary observation of an electron with a gamma-ray microscope. Niels Bohr developed his own quantum versions of the two-slit experiment in conversation with Einstein at the fifth Solvay conference in 1927 (see Bohr 1959, exp. 216 ff.), following the discovery of electron diffraction.¹ The most advanced version (also explained in Barad 2007, 97 ff.) featured a microscopic spring to calculate the momentum of the electrons when they passed in one of the slits: As Bohr hypothesised, the trick would affect the electron's final position like our lights. In fact, the first *actual* double-slit experiment with electrons was performed only in 1961 by Claus Jönsson (Feynman's lecture was given on the same year, but he did not talk about it), and only in 1989 Akira Tonomura and his colleagues managed to perform one where electrons were shot one at a time.² Thus, even if wave-particle duality, on which the whole of quantum theory stands, is *per se* an unimaginable

¹ The first version was an actual experiment conducted by Thomas Young at the beginning of the 19th century to study light's interference pattern.

² There is some uncertainty (no pun intended) whether the first single-electron double-slit experiment was instead reported by Merli, Pozzi and Missiroli in 1976. I have no intention to go into the matter: a sum of the articles related to the polemics can be found in *Physics World*, 1st Sept. 2002: <https://physicsworld.com/a/the-double-slit-experiment/>.

situation, its consequences in detail (and all the reasoning that stemmed from them) were based on a completely imaginary experimental setting. The world envisioned by the quantum formalism, although still hidden from view, was characterisable as one where the double-slit experiment would have taken place in the fashion described.

By the end of the 1920s, the quantum revolution was completed in its fundamental elements, to the point that they mostly remain unaltered today.³ Differently from relativity, it had been a collective effort, with various theories collapsing together. The starting point was Planck's correction of the black-body radiation theory in 1900.⁴ Faced with an incongruity between the current formulations and the experimental results, Planck hypothesised that action (that is, the scalar quantity measuring the evolution of a system: its energy times a given time or, alternatively, its momentum times a given length) is granular, i.e. always multiple of a constant h . Five years later, Einstein gave a precise physical meaning to what stemmed at first from a need of mathematical precision, demonstrating through the photoelectric effect that light comes in granular elements whose energy, just like Planck supposed, depends on its frequency and on h . Following Planck, he termed these energy packets "quanta" ([1905] 1990a). Along with the atomic nature of light, Louis De Broglie hypothesised in 1923-24 that atoms of matter possess wave-like properties and could be diffracted and generate an interference pattern on a screen. The theory was experimentally proved by Davisson and Germer by 1927, setting wave-particle duality in stone.

³ What follows is a very succinct summary. I will focus on some of these issues along this section, when the occasion arises. In light of the gargantuan bibliography on the history of quantum mechanics, I cannot but suggest a few titles that treat the topic satisfactorily at various levels of depth. Along with the very recent and historically precise Rovelli (2022, part 1), I would suggest the quite successful Crease and Mann (1996, parts 1-2). The most complete and mathematically precise work is probably Mehra and Rechenberg (1982-2001).

⁴ A black body is an ideal vessel which absorbs and emits electromagnetic radiation in an enclosed space without exchanges with the exterior and in a state of thermal equilibrium. The emitted black body radiation would depend exclusively on the temperature. Although unattainable, this system can be simulated with good accuracy. Before Planck's correction, Rayleigh's formula would have led to an infinite density of energy. The value of h is ca. 6.626×10^{-34} Joule·second.

On another strictly related front, electrons orbiting around the nucleus of an atom, according to the Rutherford-Bohr model, were found to have similarly quantised energies, distributed in levels corresponding to different orbits. Disturbingly enough, there is not an in-between: only certain energies are possible in order to have stable orbits. An increase in the atom's energy leads to a jump in the energy level, soon countered by a discharge via quantised light emission. An electron would never be found in the space and time between the two positions, before and after the jump, as if that space and time did not exist. In 1925, Werner Heisenberg decided to focus exclusively on what could be *observed*: the intensity and the frequency of the light emitted after the jump. He managed to correct Bohr's theory by enclosing all the possible observed values (he discovered shortly after that he was using matrix calculus) and published his results in 1925. It was the birth of quantum mechanics. Within the same year, Paul Dirac from Cambridge developed Heisenberg's theory from a purely mathematical point of view. Soon after, in 1927, Heisenberg followed up with his uncertainty principle, probably the most famous in the history of physics. In one of its simplified forms (Heisenberg [1930] 1949, 14), the formula reads:

$$\Delta x \Delta p_x \geq h$$

Where Δx and Δp_x are the uncertainties in the position and momentum on the x-axis of a subatomic particle, e.g., an electron. The principle states that, when the uncertainty in the position of a particle diminishes, the corresponding uncertainty in the momentum raises, with h being a *fundamental and unsurmountable* limit to our knowledge due to the granularity of the quantum of action.⁵ Thus, all predictions of position and momentum must be made in terms of probability, and the actual state of a particle can only be confirmed by experiment. Moreover, once the position of a particle is known, its momentum will be completely indeterminate, and vice versa. This means that

⁵ More precisely, the uncertainty relation should be $\geq h/2$, where \hbar (read h bar) stands for the reduced Planck's constant $h/2\pi$.

the order of the measurements counts for what will be found (a feature that is represented in matrix calculus). The same applies for all so-called conjugate variables, such as energy and time. Through this formula, the strange values found in the double-slit experiments become a little clearer – if still completely illogical. What matters here is that conjugate variables are exactly what is needed to describe the deterministic evolution of a system from the point of view of classical physics: once its coordinates and its dynamic variables are known at one instant, they can be calculated for any past or future instant via differential calculus. Quantum uncertainty completely shattered this possibility. The probabilities of quantum physics are therefore inherently different than those of classical physics. The latter are considered to be the result of a lack in the experimenter's knowledge that could be reduced to certainty with an ideally perfect apparatus (theoretically obtainable in the future); no such thing is possible at a quantum level, as if the impossibility of complete knowledge came from the actual structure of reality. From now on, my references to probability, unless differently stated, will be in a quantic sense.

In the same years, while Heisenberg was developing his matrix mechanics along with Max Born, Pascual Jordan, Wolfgang Pauli, and Paul Dirac among others, the physicists were provided with an alternative point of view. Starting from De Broglie's theoretical work, in 1926 Erwin Schrödinger developed a deterministic equation describing the wavelike behaviour of subatomic particles. More easily visualisable than an electron jumping from a position to another without apparently moving through space, and mathematically more akin to traditional physics, the wave function, usually indicated with the symbol ψ , seemed to provide a better alternative to the yet obscure matrix calculus. While Schrödinger's initial idea was radical, i.e., "that material points consist of, or are nothing but, wave-systems" (Schrödinger 1926, 1049), Max Born, in an article published at the end of the same year, corrected this view by redefining the wave function as representing the wavelike evolution of the probability that a particle would be in a certain area. Such probability amounted to the function's square value (i.e., to the amplitude of the wave). The wave-function was thus revealed as a descriptor of all virtual possible states of a particle, a fact that is aptly shown in its featuring the imaginary term

$i = \sqrt{-1}$, which becomes a real number once squared. To use Schrödinger's words almost ten years later, the ψ -function "is now the means for predicting probability of measurement results. In it is embodied the momentarily-attained sum of theoretically based future expectation, somewhat as laid down in a catalog" ([1935] 1980, 329). These expectations regard not only the position (as in the first formulation), but the maximal set of all non-conjugate observables. As a catalogue, it possesses the entirety of the possible solutions, *as if* the particle was spread out like a wave, and until a measurement is made. This means, to refer back to the double-slit experiment, that our shot electron cannot be said to be either passing through slit 1 or to slit 2 until we actually look at it. Position 1 and position 2, pertaining to the wave-function, will be equivalent to a superposition of waves close to each other but not completely overlapping.⁶ This whole virtual system develops deterministically until a measurement is made, at which point the wave function *collapses* onto a specific state while all others become equal to zero. Since quantum states (such as position) are mathematically represented as vectors in a multidimensional vector space (the Hilbert space), once the function collapses, the system will be left in the observed state, called *eigenstate*, with its variable corresponding to an *eigenvector* (*eigen* roughly meaning "own") with a specific observed value called *eigenvalue*. The value of a state is mathematically constituted by an operator, viz. a function that modifies the vector. The notion of wave function can be applied both to the sum of values that a determinate state can receive, and to the vector describing that very state, which is represented through those values (see Susskind 136). Since we are not dealing here with the specifics of the mathematical description, I will use the term in this second sense, as the descriptor of the entire state-before-collapse. The evolution of this state is described in turn by Schrödinger's equation.

⁶ As David Albert explains, since this condition depends on the fact that we are not observing, and would be tampered by observation, a superposition between two states means that the electron is not in one state, nor in the other, nor in both, nor in neither. "And what that means (other than "none of the above") we don't know" (1994, 11). The reason behind this seems to be that our common logic is not, apparently, the same logic employed by nature.

Thus, we are forced to admit that particles are always individuated as particles, but at the same time spread as waves, and focusing on one of the features diminishes our power to look at the other. The same can be said for light-particles/photons. In 1927, Bohr named this predicament *complementarity*, characterising waves and particles as abstractions of a more complex situation, which we are forced to use in order to make statements about the world, but that cannot be both used at the same time. Since one or the other appears in the observation depending on how the experimental apparatus is set, the distinction between a subject that studies without interfering and an object that can be studied in total independence fades away. To Bohr, objectivity now depends on accurate description of the experimental conditions.

To sum up: with quantum physics light and matter are discovered to possess properties characteristic of both waves and particles: a description in terms of one impedes a description in terms of the other. Mathematically, their states can be described as vectors with the help of matrix calculus and of the wave function. Through the wave function, it is possible to describe deterministically the evolution of all possible states, which form a superposition of waves, and their connected probabilities. Once a measurement is made, however, all probabilities collapse into an observed eigenstate and the superposition is resolved. At this point, and only at this point, pure chance takes over: the quantum of action stops us from ever making completely certain predictions, as our experimental setting influences the results and allows us to speak only of part of the picture. Finally, this intrinsic indeterminism is not an exclusive property of subatomic phenomena, but of all phenomena. However, at a macroscopic level, with innumerable atoms playing a part, the uncertainty is imperceptible. All these concepts constitute the so-called Copenhagen interpretation which is still valid today. However, while quantum mechanics provides a working formalism, it is not clear at all why it works. This has sparked a wealth of theories involving a great deal of scientific imagination.

In the next three chapters, I will study Valéry, Woolf, and Gadda's connections to quantum mechanics in their later literature through various perspectives connected to the quantum revolution:

the imagination of the unimaginable; the visualisation of possibility; the subject/object confusion; the relation between continuity and discontinuity.

*Imagination at Its Boundaries**Valéry, Mon Faust, Quantum Theory*

On the first of March 1930, at the *Société française de philosophie*, Léon Brunschvicg discusses the problem of causality and determinism in quantum physics with Paul Langevin, Louis De Broglie, and others, in a follow-up of Einstein's conference on November 12th.¹ The first two agree that determinism should be maintained, even at the price of adapting the methods for pursuing knowledge. Langevin summarises: "S'il y a indétermination dans la réponse de la Nature, c'est que la question est mal posée" (De Broglie 1930, 401).² To him, abandoning the very concept of particle individuality in favour of the undulatory model is the only way to prevent Nature from *choosing* what to do in the spur of the moment. De Broglie, while favourable, advises that the notion of corpuscle itself should be re-imagined to account for the new experimental data. From the public, however, Paul Valéry voices a more general preoccupation:

Je crois que nous en sommes à un point critique, – au moment d'une crise de *l'imaginabilité* . . . Pouvons-nous raisonnablement parler en termes visuels de choses que suppose la vision? Tenter d'imaginer un photon, n'est-ce pas introduire insidieusement un photon du photon? N'en sommes-nous pas au point où il faut prendre une décision quant aux images et à leur rôle? Voilà une question pour philosophes. (409)³

¹ See ch. 2.2, p. 151.

² "If there is an indeterminism in Nature's answer, it is because the question is posed improperly."

³ "I think we are at a critical point, – at the time of a crisis of *imaginability* . . . Can we reasonably talk in visual terms about things that vision is based on? Trying to imagine a photon, is that not insidiously introducing a photon of the

In that occasion, Langevin answered with assurance: it was just a matter of getting used to the new atomic phenomena. Yet, he himself had just concluded that those very new phenomena ought to be limited in their identity (i.e., seen as waves) for methodological reasons.

Valéry's preoccupations come back, once again, to the problem of the body and the senses. Quantum physics' revolution had deprived the scientists of a unitary vision of the world. Wave-particle duality, and most of all the focus on *observables*, could staple the very conditions of scientific innovation: since the subatomic world – the “*infra-monde*,” as he called it sometimes (*CE* 1:776) – pertained to a pre-sensual sphere, followed rules that completely redefined the meaning of chance and observation, and could only be accessed through technical intermediaries (or *relais* – i.e., relays), how could the scientists define their ontological stance?

In this chapter, I am going to precise the nature of Valéry's relation to quantum physics in his later years, both in itself and with regards to literature. From that vantage point, I will analyse his last work, the play *Mon Faust* (“*My Faust*”; 1940-45), and precise the nature of what Valéry terms “*mystique sans Dieu*” (“*Godless mysticism*”), the incommunicable state brought about by accessing the *Moi pur* (and, ultimately, by an intellectual form of eroticism). After a brief look on some of the concepts on debate in those years, I will reconsider Valéry's take on the scientific crisis of imagination and show the part played by quantum physics in his literary work and in his reflections. I will then rely on two Valéryan concepts for the close reading of *Mon Faust*: *implexe* and *harmonics*. The analysis will prove useful, more generally, to display how quantum phenomena can provide tools to evoke elements at the limit of the unspeakable, such as the working of chance, and the condition of virtuality/possibility, i.e. of a state of existence within a system that combines real and imaginary characters. It will also provide insight on Valéry's late study of his *CEM* (“*Corps Esprit Monde*”) system, and his idea of how to represent it through art in general, and fiction in particular.

photon? Aren't we at the point where we need to take a decision about images and their role? There you have a question for philosophers.”

Debating Determinism and Worldviews

As anticipated, the issue of scientific imagination was not as far from that of determinism as it seemed at first sight. Langevin's declarations on the necessity of privileging the wavelike properties of subatomic particles, although destined to fail, was neither isolated nor dismissed. Max Planck too made similar claims around the same years. Planck started from the common assumption that classical physics generates a *Weltbild*, or world-picture, where the elements of the sensory world are "translated" into symbols (along with other purely abstract entities, such as the systems of reference) and made to operate deterministically. In the face of classical physics' failure, he argued that determinism, to him science's most important heuristic principle, could be maintained by changing the world-picture: "For this purpose, the traditional primary constituent of the world picture, the material point, had to be deprived of its basic, elementary character; it was resolved into a system of material waves. These material waves constitute the primary elements of the new world picture" (Plank [1932] 1950, 135).

In *Réel et déterminisme dans la physique quantique* ("Reality and Determinism in Quantum Physics"), published posthumously in 1933 with a preface by Louis De Broglie, the philosopher of science Émile Meyerson firmly refuted Langevin and Planck's view, reducing determinism to a historically inessential quality. To him, the whole scientific endeavour was based on the necessity of *explaining* reality, much more than on the possibilities of action on the real. In a neo-Kantian fashion, he was thus led to focus on the ultimate essence of the physical objects of study, to be expressed as sensation-derived images. To Meyerson, the final aim of science would be to obtain such unchanging, permanent image, allowing to recognise a phenomenon as itself even in its evolution. Such permanence, called by him "identité" (roughly translatable as *identity*), was to him indispensable to identify the real phenomena behind scientific laws: "Or il est clair que la particule ne peut demeurer identique que par le fait qu'elle est individuelle. Et dès lors, on est amené à se demander comment

pourrait se créer la notion d'un réel qui serait dépourvu de tout attribut individuel" (Meyerson 1933, 18).⁴ In fact, Meyerson's system hinged on the internal incompatibility between an ideal of pure identity, deriving from the sensation of permanence encountered in common experience, and the ontological impossibility of a completely immutable object, which led to theoretical irrationalities requiring constant correction, thus fuelling scientific progress (see also Mills 2014). Despite the current lack of a unitary worldview in quantum physics, Meyerson felt sure that "[l]e physicien, dans l'avenir, sera presque inévitablement poussé . . . à rechercher la signification physique des concepts qui lui fournit le raisonnement mathématique" (1933, 49).⁵

Three of the four actors at play in this discussion were Valéry's friends and, as we have seen, he was actively engaged himself. ⁶ We can jump to the summer of 1942, when he published his "Vues personnelles sur la Science" ("Personal Views of Science") in the journal *Patrie* ("Homeland"). Summarising his preoccupations with contemporary physics, he implicitly recalled these debates and linked them to the issue of society at large. Firstly, the scientific view was proving more and more shifting every day and summed up conceptions that although working in practice, were theoretically incompatible: "On venait à peine de porter au plus haut point de souplesse et de généralité le merveilleux invertébré de la Relativité, quand le «quantum» vint en rompre le charme" (*Œ* 3:1254).⁷ Secondly, the quantum revolution had led to an "inaccessible absolu" (1254)⁸ that defeated imagination and was graspable only through *relais*. In it, with implicit reference to Meyerson,

⁴ "Now, it is clear that the particle can remain identical only by being individual. And therefore, one is led to ask oneself how a notion of reality deprived of any individual attribute could ever be created."

⁵ "The physicist, in the future, will almost inevitably be driven . . . to search for the physical meaning of the concepts he is provided with by mathematical reasoning."

⁶ Valéry had a close relation to Langevin since 1924, when they were introduced by Jean Perrin, the physicist whose laboratory Valéry frequented assiduously especially in the twenties. He first met Louis De Broglie and his brother in 1923 and they always remained quite close. See Jarrety (2008, 549, 673, and *passim*); and Auger (1983). On Valéry and Meyerson's friendship, see Telkes-Klein (2007, 362-64).

⁷ "That magnificent invertebrate we call the Theory of Relativity had just reached its peak of generality and flexibility when Quantum Theory came along and broke its spell" (*CW* 11:174).

⁸ "[A]bsolutely inaccessible realm" (*CW* 11:174)

“l’identité elle-même (sans laquelle, point de pensée) doit être récusée” (1256);⁹ the consequence was an ever-increasing distinction between “une *valeur fiduciaire* qui périclité, et une *valeur OR*, valeur réelle” based on everlasting and increasingly powerful “*recettes qui réussissent toujours*” (1257).¹⁰ Nonetheless, against all odds, Valéry concluded by turning the tables and reappraising the declining face value of science against its prevailing operationalism: “Si la science s’achève et doit s’achever en formules d’actes, *la création de la science est œuvre d’art*” (1257).¹¹ Thus, he described science as a practice suspended between aesthetic and imaginative research on the one hand, and the surprise of facts on the other, sustained by faith and ambition. Even more importantly, science eventually redefined that very human being from which it seemed to have detached: “[L’homme] a fini par trouver dans la science positive une voie qui s’éloigne sans retour et sans déviation de ce qu’il a cru être, et qui le mène il ne sait où. L’homme est une aventure...” (1259).¹²

Compared with the possibility, flung in 1930, of refuting imagination altogether, this seems like a cautious return to the youthful ideals of the *Léonard de Vinci*, where science and art stemmed from the same root. It is, we should note, not an isolated case: in November 1942, Valéry concluded his *Dialogue de l’arbre* (“*Dialogue of the Tree*”), enacting a conversation between Tityrus and Lucretius, the poet and the natural philosopher, in the shade of a beech tree. As William Marx has noticed, “[m]ore than in any of the preceding dialogues . . . the two characters . . . seem two inextricable parts of the same writer” (1998, 161). Their personalities drip into each other and commix: Lucretius admits the fictional nature of scientific inspiration,¹³ Tityrus the aesthetic quality of theory. The connection

⁹ “[T]he very principle of identity (without which thought cannot exist) must be challenged” (*CW* 11:176).

¹⁰ “[A] *face value* that is collapsing, and a value redeemable in gold, a real . . . value”; “[*recipes*] that always succeed” (*CW* 11:177). On the concept of *fiducia* from a more general point of view, see also Lucas (2019).

¹¹ “While the end product of science may properly be formulas for action, the *process of creating science itself* is like the *creation of art*” (*CW* 11:178).

¹² “[Man] has reached the point of finding in empirical science a path that is carrying him away from what he thought he was, with no deviation or turning back, and leading him he knows not where. Man is an adventure” (*CW* 11:179).

¹³ In fact, Tityrus persuades him with the old motto of “Au sujet d’*Eurêka*”: “AU COMMENCEMENT ÉTAIT LA FABLE” (*Œ* 3:657) (“IN THE BEGINNING WAS THE FABLE”; *CW* 4:169), to which follows the cosmogonic myth of the world tree.

between art and science is thus far from broken, while myth and images keep playing a preponderant part. All this happened in a Paris conquered by the Nazi and their technology, a much worse situation than that depicted after the Great War in the *Crise de l'esprit*.¹⁴ Was Valéry simply flying from reality?

I would suggest, instead, that these works are the result of a long-lasting reflection, at least since the impasse reached at the philosophers' society, which had recently found a mode of expression in the writing of *Mon Faust*. Started in exile in Dinard in August 1940, the text was divided into two main pieces: *Lust ou la Demoiselle de crystal* ("Luste, or The Crystal Girl") and *Le Solitaire ou le Malédictions d'Universe*, ("The [Solitary], or the Curses of the Cosmos").¹⁵ *Lust*'s acts 1 and 2 and *Le Solitaire*'s act 1 and intermission were completed before his return to Paris in September.¹⁶ Shortly after, Valéry completed *Lust*'s third act. He kept working on a fourth, as well as on a third act of the *Solitaire* mostly between 1941-42 and 1944-45, but never completed either of them. The work was published in two editions by Gallimard, in 1944 and in 1945, with the final title *Mon Faust (Ébauches)* ("My Faust (Sketches)"), comprising *Lust*'s acts 1 to 3 and *Le Solitaire*'s act 1 and intermission.¹⁷ Indeed, this was but part of a larger cycle, hypothetically an overview of contemporary society including the already discussed problems of modern physics. Yet, it also presupposed a role for science which is well described in Valéry's 1937 conference "Notre destin et le Lettres" ("Our Destiny and Literature"). Commenting that, in the face of the novelties of the contemporary age, "[à] la comédie et à la tragédie humaines, l'élément féerique s'est combiné" (*Œ* 1:1549),¹⁸ Valéry outlined

¹⁴ See ch. 2.2, 140 ff.

¹⁵ Although David Paul translates *Le Solitaire* with "The Only One," which sounds more effective in English, I chose to maintain the linguistically equivalent "The Solitary," as it seems more appropriate in the light of the fourth act – where he is revealed as a part of Faust.

¹⁶ This first version (minus the intermission) had been published in a 101-exemplary edition by 1941 with the title *Études pour "Mon Faust"* ("Studies for 'My Faust'").

¹⁷ See also the note to the text by Jarrety in *Œ* 3:975-90.

¹⁸ "To the human comedy and tragedy has been added an element of the fairy-play" (*CW* 10:168).

See also, in his *Cahiers* in 1934-35: "L'accroissement illimité du *ce que peut l'homme* tue l'idée de la distinction entre *ce qu'il peut* et *ce qu'il ne peut*, distinction qui fondait l'idée de pouvoir «surnaturel»" (*C* 17:679; *Pl* 2:891-92)

his contemporary society as dominated by the unexpected. He then proposed to develop, with the inspiration of recent science, a new literary “*fantastique de l’esprit* duquel . . . ni Verne, ni Wells, ni Poe lui-même . . . n’avaient osé imaginer les possibilités” (1566),¹⁹ and urged the scientists, as a possible way out of their impasse, to focus on those same human faculties (mind and senses) from which stems the source of imagination.

I would argue that, in *Mon Faust*, science is not only taken to the bar, its methodological issues laid bare for the public to see, but also helps accomplishing that *fantastique de l’esprit*, that fairy-tale character of modern life. Indeed, *Le Solitaire* is defined as “*Féerie dramatique*” (CE 3:1137).²⁰ In this context, scientific discoveries, and quantum mechanics in particular, become analogical tools for reflection and worldbuilding.²¹ Free from any pretence of realism, emphasising the very fictionality of his storyworlds, Valéry uses them in *Mon Faust* to show the features of his *CEM* system. As we will see, the very unimaginability of the quantum model played a preponderant part in this endeavour.

Quantum Images: Book, Head, Dice

As anticipated, *Mon Faust* takes the form of a cycle, of which *Lust* and *Le Solitaire* are but the most complete parts. A good deal of manuscript notes, taken between 1940 and 1945, shows the sketched plans for Faust’s peregrinations with the devil: visits to a doctor and physicist, a scene on a battlefield, at the League of Nations, and so on. I am going to focus on the two main pieces, both the

(“The boundless increase in *what man can do* is killing off the idea of a distinction between *what he can do* and *what he can’t*, the distinction that is the basis of the idea of ‘supernatural’ power”; *C/N* 4:281).

¹⁹ “[I]ntellectually fantastic, with possibilities which . . . neither Verne, nor Wells, nor Poe himself . . . dared to imagine” (*CW* 10:184).

²⁰ “Dramatic Fairy Tale” (*CW* 3:143).

²¹ Thus, in 1943: “[L]isant un livre de science, les faits eux-mêmes, si intéressants qu’ils soient, ne me saisissent qu’à titre de combinaisons de choses connues qui peuvent avoir des applications par analogie, ou comme exemples, ou comme modification d’associations existantes” (*C* 27:349; *Pl* 1:216-17) (“[W]hen reading a scientific book, the facts themselves, however interesting they may be, only strike me in their capacity as combinations of known material which may have analogical applications, either as examples, or as a modification of existing associations”; *C/N* 1:242).

concluded parts and the unfinished *Lust*'s act 4 and *Solitaire*'s act 3 (it soon appears from the manuscripts that the intermission counts as a second act). The thematic importance of the unfinished parts has been emphasised by Ned Bastet, to whom they “apparaissent . . . comme les vrais centres de gravité de l'œuvre et le lieu de sa vérité” (1989, 97).²²

As with *Eupalinos*, *Mon Faust* is the result of the “expansion” (Doležel 1998, “Epilogue”) of a previous storyworld. The Faust we are dealing with is the same of Goethe's two works. Not in Heaven, but continuing his life on Earth, he is part of a storyworld where the marvellous has an active place. Nonetheless, we should be wary of giving too much credit to the intertextual link: despite Valéry's calling back to the hypotext in an introductory note (*Œ* 3:991-92), and despite various analyses of the intertextual relationships between him and Goethe (see for example Dabezies 1991; Blüher 1991), Valéry referred to the Goethian *Faust* only in general terms. In fact, as Roberta Tanzi explains, he thoroughly read Goethe's masterpiece for the first time *after* coming back to Paris, when most of the work was done, and without too much appreciation. (2010, par. 37) He was far more interested in Faust as a figure of Goethe, an incarnation of the European intellectual spirit now at the threshold of its dissolution (par. 61 ff.).

Lust begins *in medias res*, with an old Faust in his study, dictating (without too much success) to his young secretary. Mephistopheles soon joins them, evoked by Faust's unconscious attraction for Lust, and the conversation between the two old friends (act 1, scene 2) informs the reader/audience of the plot's circumstances. Forced to live in perpetuity, prey to a Nietzschean eternal return made of boredom and disillusion, Faust declares to be trying to free himself from life. Here, already, some clarification is in order. Faust's condition of cyclicity is related to a saturation of enacted possibility. As Valéry writes in his notes, Faust does not know what will come, but he anticipates how his body and mind will react to it: “Il ne prévoit pas les faits, mais les suites de ces faits dans les sentiments.

²² “[They] appear . . . as the true gravity centres of the work and the site of its truth.”

Tout lui semble non déjà arrivé, mais déjà vécu” (*NAF 19040*, f. 14).²³ Unable to experience surprise, Faust loses a core character of his humanity, connected to the instauration of both the world and the self. Indeed, a power surge in one’s attention produces the feeling of an autonomous reality, opposed to something more profound and personal – a structure which Valéry paralleled to the electronic levels of an atom with respect to its nucleus.²⁴ As the fairies will sing to Faust in the *Solitaire*’s intermission: “Que seriez-vous sans la surprise?” (*CE 3:1161*).²⁵

To fight against this condition, Faust is creating something to “me débarrasser tout à fait de moi-même” (*CE 3:1023*).²⁶ Conscious of his state as popular myth, already prone to fictionality, he plans to achieve his goal by writing a book:

Il serait un mélange intime de mes vrais et de mes faux souvenirs, de mes idées, de mes prévisions, d’hypothèses et de déductions bien conduites, d’expériences imaginaires: toutes mes voix diverses! On pourra le prendre en tout point, le laisser en tout autre... (1021)²⁷

He goes on to describe the book as mixture of prose and poetry, fantasy and rigour, which reveals itself at points as pure, everchanging thought, and at others as a symbol of actual objects. To avoid the cage of enacted possibility, Faust therefore plans to become an incarnation of potentiality: an object containing different and contrasting expectations of himself, which falls onto any depending

²³ “He does not predict facts, but the consequences of these facts on the sentiments. Everything seems to him not already come, but already lived.”

²⁴ In these same years, Valéry would note in the *Cahiers* how surprise equalises *both* sudden sensations and sudden thoughts, “par opposition à la constance ou à la présence latente de quelque – – niveau,” specifying “Cf. le changement d’orbite de l’électron de Bohr. *Émission d’énergie oscillatoire*, ici entre l’antérieur et le présent” (*C 24:410; Pl 1:1086*) (“in contrast to the consistency or latent presence of some – – level. / Cf. the electron’s change of orbit according to Bohr. *An emission of oscillatory energy*, occurring here between the previous and the present”; *C/N 3:225*).

²⁵ “What would you be without the unforeseen?” (*CW 3:195*).

²⁶ “[R]id me finally of myself” (*CW 3:34*).

²⁷ “I want it to be an inextricable blend of my true and my false memories, my ideas, my intuitions, my well-conducted hypotheses and deductions, my experiments with the imagination: all my many voices in one! A book one could begin at any point and leave off at any other....” (*CW 3:32*).

on the reader, only to go back to virtuality soon thereafter, refusing linearity and autonomous existence, never fully resolving its contradictions. This imaginary (and impossible) object has been connected to a somewhat parodied version of the ideal book imagined by Mallarmé, Valéry's old master, "où tout le vécu viendrait s'exprimer, se consommer, et s'abolir" (Gifford 1991, 142).²⁸ Yet, Faust's book also shows properties that seem to pertain to the quantum realm: a superposition of incompatible possible results (Faust's "voix diverses") randomly collapsing upon observation.

Let us dig deeper. In July 1940, just one or two months before writing this scene, Valéry came up with one of his *Histoires Brisées* (*Broken Stories*): "L'Île Xiphos" ("The Island of Xiphos"). The setting is rather mythical:

Il y avait à Xiphos, dans l'île, sur un mont, un temple, plus ancien semble-t-il, que l'île même, étant fait d'une pierre noire qui ne s'y trouve nulle part, assemblée curieusement par blocs prismatiques qu'agrafaient des crampons de métal inconnu. Et là était conservée une tête parlante aux yeux fermés. Et la tête était dans le temple mais contenait l'univers. On la fait briser et ouvrir et... des dés – de cristal qui sont maintenant l'un à Rome, l'autre [inachevée]. (*Œ* 3:1366)²⁹

The narrator reports that, when the philosopher Ælianus of Colophon tried to talk to it, "[c]ette tête répondait par toutes les réponses possibles et insinuait ainsi le mépris de la vérité" (1367).³⁰ The head, too, mixes up elements of Mallarmé's aesthetics with others of quantum mechanics. On the one hand, the dice call back almost automatically to Mallarmé's fundamental *Un coup de dés jamais n'abolira le hasard* ("A Dice Throw at Any Time Never Will Abolish Chance"; 1897-1914), along with other minor hints (Mallarmé lived in Rue de Rome). On the other, the head strikes as an

²⁸ "[W]here all the lived would express, consume, and abolish itself."

²⁹ "There was in Xiphos, inland, on a mountain, a temple apparently older than the island itself, being ingeniously constructed from prismatic blocks of a black stone not local to it, which were riveted together with an unknown metal. And in it was preserved a head with closed eyes, that spoke. And the head was within the temple, but within the head was the universe. They broke it open and... crystal dice of which one is now in Rome, the other in [incomplete]" (*CW* 2:121).

³⁰ "This the head countered by supplying all the alternative answers possible, insinuating thus its disdain for truth" (*CW* 2:122).

allegorical reproduction of the universe according to the two leading theories in physics: surrounded by a geometrical architecture (that of relativity, as we have learned from analysing *Eupalinos*), it has at its core the randomness of the quantum world. It explicitly refutes what is probably Einstein's most quoted phrase, "God does not play dice."³¹ Moreover, the head's non-response, just like Faust's book, mimics the wave-function's status before a quantum collapse. Connecting mental and physical events, Valéry confirmed the quantic shade of Mallarmé's last verse: "Toute Pensée émet un Coup de Dés" (2006, 159).³²

The book and the head, similarly to *Eupalinos*' seashell, have a double role. On the one hand, since they (can) exist in their respective storyworlds, they express from a macroscopic point of view the latter's quantum character: like the double-slit experiment described in ch. 3.1, their existence is conditional and provides a visible (or at least partially imaginable) equivalent to their worlds' deepest (and indeterministic) design; on the other hand, the book in particular denounces a structural trait of art and fiction: the artificiality of poetic and narrative linearity in the face of natural chance. Valéry had always been interested in the topic, and even more so in his late years. Thus, he wrote in 1937 in "Fragments des mémoires d'un poème":

Peut-être serait-il intéressant de faire *une fois* une œuvre qui montrerait à chacun de ses *nœuds*, la diversité qui s'y peut présenter à l'esprit, et parmi laquelle il *choisit* la suite unique qui sera donnée dans le texte. Ce serait là substituer à l'illusion d'une détermination unique et imitatrice du réel, celle du *possible-à-chaque-instant*, qui me semble plus véritable. (*Œ* 3:782).³³

³¹ The phrase had been pronounced at the fifth Solvay conference in 1927, at the presence of many of Valéry's friends, and soon became quite famous. See Kumar (2010, 274).

³² "Every Thought emits a Dice Throw" (Mallarmé 2006, 181)."

³³ "Perhaps it would be interesting, *just once*, to write a work which at each juncture would show the diversity of solutions that can present themselves to the mind and from which it *chooses* the unique sequel to be found in the text. To do this would be to substitute for the illusion of a unique scheme which imitates reality that of the *possible-at-each-moment*, which I think more truthful" (*CW* 7:104).

The notion of “*possible-à-chaque-instant*,” as already noticed by Ilya Prigogine (1983, 257-60), confirms Valéry’s anti-deterministic tendencies, in line with contemporary science. Moreover, the nodes subdividing a story into minimal junctures³⁴ have been often considered theoretically. E.g., they correspond with good accuracy to Roland Barthes’ cardinal functions (or *nuclei*) which, in his structuralist account, are the main type of those “smallest narrative units” (1975, 245) – along with the less fundamental catalyser, index, and informant. Nuclei provide basal pieces of meaning by expressing an action that “opens (or maintains or closes) an alternative directly affecting the continuation of the story” (247), thus instantiating both a chronological *and a cause-effect* plotline.³⁵ Similarly, within our theoretical framework, Doležel develops Von Wright’s possible-worlds treatment of action theory (which unifies the notions of action and event, i.e., transformation of a state). He affirms: “In the possible-worlds perspective a person’s life history is a vector in multidimensional space. The person-agent advances from one node to another by bringing about or allowing to happen one of the alternative changes available at each node” (1998, 56).³⁶

Faust’s book, expressing the “*possible-à-chaque-instant*,” taps into such minimal units of narration (providing the causal structure of a plot) only to show the problematical nature of their linkage and contest the apparently deterministic nature of narrative plots. Therefore, from within the storyworld, Faust’s escape from existence, while apparently corresponding to a recentering from his own actual world to a new fictional world, in fact maintains the latter in a state of virtuality that is only partially (and only temporarily) resolved by the reader’s momentary choice, as any fact could be countered by its contrary in a successive reading. Thus, for example in *Lust* (act 2, scene 5), Faust is able to relegate a part of his actual life (his love affair with a young widow) to fictionality right

³⁴ Faust refers to them as “ces nœuds qui sont les événements d’une vie” (*Œ* 3:1008) (“all the knots which are the events of a lifetime”; *CW* 3:21).

³⁵ Interestingly, Barthes considered Mallarmé’s *Coup de dés* as “the very blazon of all narrative forms” (1975, 250) developed by focusing on a few nuclei and expanding them with other functions.

³⁶ If, up to here, the parallelism between Barthes’ structuralism and Doležel’s fictional-worlds theory is quite functional, the differing takes on most issues, last but not the least the essence of fictional characters, does not allow to draw it further.

after having dictated it to Lust, just to appease his secretary's distress. Far from being the transparent "demoiselle de cristal" (*CE* 3:1006)³⁷ that Faust would like her to be, Lust actively interferes with the ontological status of her master's life.

While this theoretical-fictional system seems to continue Mallarmé's reflection on the importance of poetic possibility, its specific traits reproduce the structure of the wave function. As quantum images, head and book are made to show the superposition of different occurrences as a virtual/theoretical supersystem, and the limitation of the actual event in the face of it. Opening the book, throwing the dice, choosing a path, are thus presented as wave function collapses. The old master and the new science should not be put in opposition: rather, literature and science here synergise perfectly. Even Gaston Bachelard, in the same years, expressed the aesthetic character of the new physics' mathematical generalisation by quoting Mallarmé ([1934] 1984, 58), bringing tensorial calculus and Schrödinger's equation as examples, and emphasising the importance of imaginary terms in the thought process: "[T]he scientific spirit cannot limit itself to conceptualizing the salient points of one particular experiment; rather, it must attempt to conceptualize all *possible* experiments . . . The real turns out to be a special case of the possible" (59).³⁸

Up to now, I have been using the terms virtuality and possibility interchangeably. This is inevitable, as their semantics tends to vary with the writer and the field. In general, in physics, "possible" defines states in terms of probability, and "virtual" is used for heuristic units of measure or purely apparent phenomena (e.g. in optics). Valéry seems to use possibility more often than virtuality, yet somewhat interchangeably. Of their various definitions received in the last years, a productive one remains Gilles Deleuze's. To Deleuze, just as the possible is opposed to the real, so is the virtual opposed to the actual. On the one hand, "[t]he reality of the virtual consists of the

³⁷ "[C]rystal Girl" (*CW* 3:19). Note the connection to the crystal dice of Xiphos' head.

³⁸ In fact, Valéry uses the same words while thinking of the themes to bring up in a possible prelude to the Faustian cycle: "Tout le réel devenu cas particulier du possible" (*NAF 19041*, f. 70) ("All the real become a special case of the possible").

differential elements and relations along with the singular points which correspond to them. The reality of the virtual is structure” ([1968] 2001, 209). That is, the virtual foregrounds a development that is formally determined: it is a non-actualised part of the object, i.e., what that object could be given certain circumstances, a future already contained in the object. The possible, instead, represents something equal to its real counterpart in all its aspects, except for reality itself:

Such is the defect of the possible: a defect which serves to condemn it as produced after the fact, as retroactively fabricated in the image of what resembles it . . . The virtual possesses the reality of a task to be performed or a problem to be solved: it is the problem which orientates, conditions and engenders solutions, but these do not resemble the conditions of the problem. (212)

This conception has resonances with the quantum mechanical point of view. Although Deleuze is here talking of organisms more than of particles, possible and virtual can help discuss the wave function’s nature. Governed by Schrödinger’s linear partial differential equation, the wave function represents the sum of the possible values of a state, according to the observer’s knowledge: the superposition of waves each related to a certain value for the state (with their amplitude giving the corresponding probability) involves a condition where nothing about the state itself can be logically said,³⁹ and yet the possibilities of a state can be followed deterministically, as would be possible for real phenomena in classical physics. The wave function, thus, shows the hypothetical evolution of certain characters (values) of a phenomenon as if we were able to observe them without disturbing them. Yet, at the quantum level, any observation is exactly that disturbance. A state is therefore suspended somewhat out of time until the collapse (Valéry’s thrown dice, opened book, felt sensation, thought suddenly sparked).⁴⁰ It is an interwoven yet contradictory bundle of possibilities, a virtuality in Deleuzean sense, within a space that is both ontologically and mathematically complex: a state is

³⁹ Remember David Albert’s comment quoted in ch. 3.1, 229 n. 6.

⁴⁰ Thus Heisenberg: “It should be emphasized . . . that the probability function does not in itself represent a course of events in the course of time. It represents a tendency for events and our knowledge of events” ([1958] 2000, 15).

pure theory yet inextricable from reality; it involves imaginary numbers combined with actual values. Nothing there has happened yet, but everything is made to happen as if we could see it. Happening – but here we have to reshape Deleuze just a little – seems to never be an autonomous coming to existence, but the result of a disturbance, an integration, in this sense, in a larger system (object plus apparatus) which actualises a certain state (such as the position or the momentum of a particle). More than inherent structure, virtuality is a structure *qua* inclusion. Considering what has been said, therefore, while I will continue to define, in the physical sense, the states described by the wave function as “possible,” I will also allow myself the use of the term virtual, in the sense of laid out, out-of-history, and yet actualisable by encounter, i.e., by wave function collapse.

Valéry’s *Faust* describes this state exactly to Mephistopheles, as the main human discovery of his time:

FAUST. Figure-toi qu’ils ont retrouvé dans l’intime des corps, et comme en deçà de leur réalité, le vieux CHAOS...

MEPHISTOPHELES. Le CHAOS... Celui que j’ai connu? Ce n’est pas possible...

...

FAUST. Oui. Le Chaos, le vieux Chaos, ce désordre premier dans les contradictions ineffables duquel espace, temps, lumière, possibilités, virtualités étaient à l’état futur...

MEPHISTOPHELES. Ils ont retrouvé le CHAOS... J’étais Archange! (*CE* 3:1025-26)⁴¹

Please note how the discussion between the two generates a hidden pun for the reader/audience, as Mephistopheles refers to that pre-historical state as the one before *his own* collapse (in fact, the

⁴¹ “FAUST. Think of this: within the very heart of matter, beyond the brink of their own reality, they’ve discovered old CHAOS itself.

MÉPHISTOPHÉLÈS. CHAOS.... The one I knew? It isn’t possible....

...

FAUST. Yes. Chaos, the original one, the very first unutterable confusion, when space, time, light, possibilities, and [virtualities] were all in a state of yet-to-be.

MÉPHISTOPHÉLÈS. They’ve rediscovered it. CHAOS!... And I was an Archangel!” (*CW* 3:36-37).

first and arguably the most important).⁴² Moreover, describing such state, ineffability comes into play. Despite the fact that, to Faust, science is now reduced to pure power and recipes (as he goes on to explain), and that “il ne demeure rien ni de vérités, ni même des fables, qui leur venaient des premiers temps” (1026),⁴³ he is in fact describing superposition through an original myth, although still insufficient to the imagination. I must emphasise that Valéry’s description leans towards a sense of the wave function as an *actual* alternative ontology (a state out-of-history that realises *somewhere* “en deçà” and thus can be “retrouvé”) more than a simple set of future expectations (as Schrödinger defined it). While unconventional, this interpretation was both allowed by the then-current debate (as we have seen) and, importantly, much more profitable for Valéry’s analysis of what the possible can bring forth – both in fiction and in the study of human mind-body-world relations.

Considering the resemblance between the structure of quantum states and that of the book Faust is trying to write, it can be assumed that Faust wants to reach that very state of out-of-time reality that would free him from the clutches of history. A state, if we want, of *virtualisation*, which Pierre Lévy, moving from Deleuze to informatics, defined as “a displacement of the centre of ontological gravity” (1998, 26). Valéry is thus, as I anticipated, creating a structural link between his work and modern science, while condemning (through Faust’s words) the latter’s turn towards hard operationalism. Moreover, Faust’s desired condition, in its explicit fictionality, is functional to present Valéry’s late

⁴² In 1940, while in Dinard, Valéry ironically mixed quantum mechanics and thermodynamics to theology in his *Cahiers*:

“Dogme de la chute – Carnot
 Chaos (usage du) – Hasard, mélange
 Libre Arbitre – Impossib[ilité] de l’observation de la détermination complète” (C 23:575; PI 2:905).
 (“Doctrine of the fall – Carnot
 Chaos (use of) – Chance, intermixture
 Free will – Impossibility of observing complete determinism”; C/N 4:293)

I am not aware whether this was written before or after the scene just quoted, but the latter seems to me like an improvement of this note. Nonetheless, Carnot here should refer to the second principle of thermodynamics, which also links the irreversibility of thermodynamic processes and the increase of entropy in a system with the time arrow (and thus with history).

⁴³ “Nothing is left now, neither truth nor fable, of what belonged to the old days” (CW 3:37).

ideas on the *CEM* system, and the *Moi pur* at the centre of it. But to explain this, we need to take a step back.

The implexe

To better understand Valéry's angle on actuality and possibility, and their relation to the human, we need to introduce the concept of *implexe*. Although previously present in the *Cahiers* and, though without a name, in "Lettre d'un ami" ("Letter from a Friend") included in *Monsieur Teste* (ca. 1924; *CE* 1:1054), the notion receives a deeper attention in the '30s and '40s (see also Lhermitte 1983, 142 ff). The best explanation is in *L'idée fixe* (1932), a dialogue between a doctor and Edmond T. (Teste, acting as Valéry's alter ego), developing freely across a wealth of topics loosely orbiting around human thought. Edmond defines the implexe as a virtuality surrounding every being, and including its every possible response: thoughts, states, actions, and sensations resulting from the interaction with the external system. Edmond goes a long way to detach it from anything connected to the subconscious, as the latter involves a hidden activity, while the former "est *capacité*" (*CE* 2:120),⁴⁴ whose limits can be partially known (for example in the sensation of fatigue). As a system of potentiality, the implexe can be applied to single muscles or organs (125-26), as well as linguistic elements (120-23). In line with Valéry's studies of human processes as cycles, it changes drastically between sleep and wakefulness. However, and here is the catch, its main variation is on a moment-by-moment basis, and defines human identity as a system of opposed potentialities. As Edmond says:

⁴⁴ "It's a *capacity*" (*CW* 5:56).

À chaque instant, je coïncide avec ce que je tends à percevoir. Chacun, à telle heure de sa vie, est, en somme, un système... virtuel d'attractions et de répulsions, et aussi de... pressentiments de puissance et de résistance. Mais cette distribution est variable avec le temps... (140)⁴⁵

We find here *in nuce* almost all the elements that we have already discussed: the idea, linked to the wave-function, of the potential transposed into a virtual system that is partially accessed; the human system in analogy to an atom (and its electro-magnetic field); the moment-by-moment redefinition of both systems. The *fil rouge* traversing *L'idée fixe* is in fact the naturally discontinuous character of human thought – what Valéry had called, since his youth, the mind's "self-variance" (see ch. 1.2, 47 ff.) – which debunks the *idée fixe* as something that, far from retaining any permanence, simply comes back more frequently than usual. The very concept of idea to Edmond is that of a "signal de... transformation" (46),⁴⁶ which flags the discontinuous passage between two states, more than a linear phenomenon (see n. 24 in this chapter). As Karin Krauthausen explained (2010, 235 ff.), Valéry's self-variance disconnects the self from its individual states and chains it to the independent rules of a transformation process. Connectible to William James' stream of consciousness (and Bergson's "durée interne"), it nonetheless develops in time from analogy with Riemann's manifolds' theory, making the mind a n-dimensional entity resulting from the interaction of plentiful psychological planes. Yet, and against both these concepts, the mind's foundational discontinuity put Valéry in a position that was perfectly parallel to that of contemporary physics, which had to accept both the Riemann-based Einsteinian theory of a continuum and quantum theory. This became clear to him in the thirties, in the face of the now completely formalised quantum revolution.⁴⁷ Introducing

⁴⁵ "At any moment, I coincide with what I tend to perceive. At any given moment in his life each of us is a system of... potential attractions and repulsions, as well as of... inner sensations of force and resistance. But the pattern varies endlessly, with time" (*CW* 5:65).

⁴⁶ "[A] transformation sign" (*CW* 5:18). I would argue that "signal" here would be a better translation.

⁴⁷ In "Lettre d'un ami," Teste talked of the variation of the possibility of being surprised, and of "certaines probabilités mentales" ("certain mental probabilities") that change our natural reactions, from which "[u]n physicien hardi" ("[a] bold physicist") could have risked defying "un éloignement par une certaine distribution intérieure" ("a postponement as a certain inner distribution") (*Œ* 1:1054; *CW* 6:49). We can see that variable probability was already

a discontinuous and random change in its phenomena, quantum mechanics emphasised the importance of defining a system of possibilities, and both showed a feasible formalism for, and reconnected itself with, Valéry's long-lasting conceptions. Thus, in 1933, a few pages after declaring that "[I]'idée essentielle de ma «méthode» . . . C'est l'idée de *pouvoir* – (*dans l'ordre de l'esprit*)" (C 16:608; *Pl* 1:837),⁴⁸ he annotated in a *Cahier*:

La «psychologie» exigerait l'emploi de moyens comme les surfaces de Riemann ou les figures topologiques pour REPRÉSENTER les passages et les substitutions qui constituent sa *structure successive* de l'état-instant.

J'y pense sans lumières depuis 40 ans. La question de continu – est le point difficile – Car ces moyens géométriques de l'analyse sont liés au continu – Et ici c'est l'hétérogène et le discontinu qui dominent. (C 16:622; *Pl* 1:837)⁴⁹

This duality was still in place in 1944. While reflecting on the finale of *Lust*'s act 4, Valéry counted six interrelated psychological planes (biological, sensorial, affective, intellectual, motorial, sensational) in the experience of love, yet concluded with a quantum analogy: "Le «Moi» est un mythe grossier – tandis que ce qui est observable, c'est *l'instant* ou plus exactement, le QUANTUM QUALE, le *tout* instantané – et sa structure instable" (C 28:870-71; *Pl* 2:550-51)⁵⁰.

This alignment, moreover, was already prepared by Valéry's interest for the black-body radiation phenomenon, the same from which Planck derived the fundamental discontinuity of action that gave

fundamental by then. However, as we have seen (ch 3.1, 228) quantum physics, developing in those very years, completely redefined the nature of the concept of chance.

⁴⁸ "The essential idea of my method . . . It's the idea of *potential* – (*in the realm of the mind*)" (C/N 5:91).

⁴⁹ "'Psychology' would require the use of means such as Riemannian surfaces or topological figures in order to REPRESENT the transitions and substitutions which make up the *unfolding structure* of the momentary-state.

I've been thinking about this for 40 years, without further insights. The question of the continuous – is the difficult point – For geometrical means of analysis are linked to the continuous – Whereas the heterogeneous and the discontinuous are predominant here" (C/N 5:92).

⁵⁰ "The 'Self' is a gross myth – whereas what is observable is the instant or more exactly, the QUANTUM QUALE, the instantaneous *whole* – and its unstable structure" (C/N 1:576).

birth to quantum physics. The unobservable interiority of the black body reflected the purity of a “Moi” perceived, at times, in the internal autonomy of the body-mind system (see also ch. 1.2, 58 and 68). In 1911, Valéry pointed out:

Mon corps rayonne *dans* le noir, *vers* une conscience, la sienne . . . En présence du *noir*, c’est le possible que je rayonne.

Or ce que je conçois, c’est ce que je rayonne. Je n’absorbe que ce que j’émet.

Je ne perçoit que ce que je rends.

Si je ne reçois rien – je puis encore émettre quelque chose . . . Et je place quelque source intérieure, là.

Et elle est le temps pendant lequel je me donne sans recevoir. (C 7:322; Pl 1:917)⁵¹

Please store in mind, for now, that Planck’s formulas considered electrons emitting and absorbing quantised energy within a black body as discontinuous harmonic oscillators, an idea which was implemented in the Rutherford-Bohr atomic model to consider the atom as a harmonic oscillator.

We can thus say that the implexe pertains to, and is probably the mechanism behind, the phenomena of the head of Xiphos and of Faust’s ideal book. Virtual systems surrounding an entity, producing a discontinuous series of apparently random reactions due to the effects of the external world-system, the implexe runs parallel to the quantum wave function. Having conscience of one’s implexe is thus a means to reduce randomness as much as possible. Yet some randomness should be inevitable, and Faust, completely possessing his own implexe, is thus stripped of his human nature. Memory, in this sense, increases one’s own implexe, providing shortcut responses to external stimuli. To Valéry, memory is a virtual structure more than a collection of events: it is not an object residing

⁵¹ “My body radiates *in* the [black], *towards* a consciousness, its own . . . In the presence of the [*black*], I radiate possibility.

And what I conceive is what I radiate. I absorb only what I emit.

I perceive only what I give out.

If I perceive nothing – I can still emit something . . . And there, I locate some inner source. And the source is the time in which I give of myself without receiving” (C/N 3:76).

in conscience, but a perennial and discontinuous mode of reconfiguration of conscience itself, something connected to changes in the internal energy of a system. To Valéry, the past is always present, itself a system of potentialities ready to reactivate. Yet, such reactivation is not always controllable, as it impinges on the randomness of external stimuli even more than on active remembrance. Thus, something like a life-story, or a linear account of thought, is falsified from the start, which is, by the way, why Valéry cannot accept the narrativisation inherent in the psychoanalytic method or in traditional realistic narratives. Again in the *Cahiers*, we find tentative organisations of the memory's functions both in Riemannian or relativistic *and* in quantum or atomic terms.⁵² In 1941, interestingly, he even defines it as an operator modifying a mental state (*C* 24:862; *Pl* 1:1258), mathematically in line with Paul Dirac's then-recent quantum notation. This brings us back to most of Valéry's main preoccupations: the implexical and virtual character of memory seems to hold the key to the structural connections between external stimulus, bodily sensation, and thought (i.e., of the entire *CEM* system). Moreover, and from the beginning of his research, memory is for Valéry connected to imagination,⁵³ thus to the deeper structures of poetical creation *and* reception. I would go as far as to say that the reflection on the implexe (and memory as a part of it) is the centre of Valéry's concerns.

The quantic character of self-variance and implexe also explains Valéry's interest for the little-known atom of time, or *chronon*. The concept was introduced by Robert Lévi in 1927, to propose a completely corpuscular quantum model which extended discontinuity to time, considering it as divisible into minimal units, and treated electrons as one-dimensional entities vibrating harmonically. Although the theory remained almost unknown even within the scientific community (see

⁵² As a few examples, memory acts similarly to a Bohrian atom changing quanticly in *C* 7:402-3; *Pl* 1:1233; as a worldline in *C* 9:586; *Pl* 1:1235; it modifies the mind's space-time in *C* 14:678; *Pl* 1:1248; yet soon creates an imaginary system (using the *i* term in the formulas) in *C* 15:213; *Pl* 1:1248; only to come back as a geodesic for the implexe in *C* 15:657; *Pl* 1:1249.

⁵³ Already in 1903-5: "L'imagination est usage de la mémoire comme d'une organe" (*C* 3:265; *Pl* 1:1212) ("Imagination makes use of memory as if it were an organ"; *C/N* 3:356).

Hossenfelder 2013, 6 ff.), Lévi had discussed it at length with Langevin (whose help is acknowledged at the end of the article; see Lévi 1927, 198). It was probably through the latter that the notion reached Valéry.

In *L'Idée fixe*, the chronon is cited, with a certain irony, as an unconfirmed idea that shows the weirdness and instability of modern thought (*CE* 2:182). Yet, once again, the notion resonated with Valéry's previous reflections and their Mallarméan foundations. For example, in 1919, in the essayistic article "Le coup de dés" ("Concerning *A Throw of Dice*"), Valéry discussed how the graphic structure of Mallarmé's poem allowed for the visualisation of the instantaneous sparking of a thought, "la fraction d'une seconde, pendant laquelle s'étonne, brille, s'anéantit une idée; l'atome de temps" (*CE* 1:1202),⁵⁴ eventually reaching a poetic universality of most precise structural organisation.⁵⁵ In light of the discussed discontinuity of self-variance and implexe, it becomes clear that the chronon, although detached from the more complex (and unsuccessful) theory that generated it, could play a part in Valéry's *CEM* system. Consider now the *Études pour Mon Faust*, where Valéry envisioned Faust explaining the theory of the Moi irradiating quanta of thought ("psychon[s]") after receiving quanta of time, and distinguishing thus sensation from Moi pur: "Sensibilité et conscience se produisen[t] par des résistances qui transforment une partie de l'énergie du milieu d'où une émission qui projette d'une part un élément positif: la sensation, d'autre part l'élément négatif: le Moi Pur: le Proton Simple" (*NAF 19041*, 173).⁵⁶ While Ned Bastet sees passages such as this as "fantaisie burlesque" mocking the current instability of science (1989, 95),⁵⁷ in view of what has been

⁵⁴ "[T]he fraction of a second during which an idea flashes into being and dies away; atoms of time" (*CW* 8:309).

⁵⁵ See also Valéry's poem *Palme* ("Palm"), from the same year: "Patience, patience / Patience dans l'azur! / Chaque atome de silence / Est la chance d'un fruit mûr!" (*CE* 1:683) ("Endurance, endurance, / Endurance, in the sky's blue! / Every atom of silence / Is a chance of ripened fruit!"); *CW* 1:233)

⁵⁶ "Sensibility and conscience are produced by resistances which transform a part of the medium's energy, from which an emission which casts on one side the positive element: sensation, on the other the negative element: The Moi pur: the simple Proton."

⁵⁷ "Burlesque phantasy."

said, I would instead take them as serious, if tentative, improvements on his ideas on the self and black-body radiations. We will see how this can be applied to the analysis of *Mon Faust*.

Manifesting the Implexe: Garden, Mountain, Chasm

We are going to quickly apply what we have found, up to now, to the published parts of *Mon Faust*, to then move to the paramount acts 4 of *Lust* and 3 of *Le Solitaire*. We can consider Faust's life as dominated by an overloaded implexe, a wave function whose possible paths have all already been observed: having the complete expectation values of his reactions, nothing that happens would ever catch him by surprise, making him feel that variation of internal energy that would prove himself to himself. His first solution is to exhaust all his possibilities, putting himself in the hands of the other (literally, as a book). Therefore, the connection between humanity and chance/possibility – up to its refusal as such in the isolation of the *Moi pur* – is the subterranean motive that transverses the two pieces, from the crucial themes to the little comic sketches.⁵⁸ His relation to *Lust*, who acquires more and more autonomy as a subject along her homonymous piece (see Ubersfeld 1984), will eventually change the nature of this solution.

Faust reaches a partial epiphany while walking with *Lust* in his garden (*Lust* scene 2, act 5), a sort of reprise of the Goethean *Faust*'s scene between the protagonist and Margaret. In a moment of pure acceptance, Faust elevates the body at the same level of the mind, zeroing his implexe for a state of *pure observation* where no trace of linearity remains. It is a sort of reformulation of *Eupalinos*'

⁵⁸ Main example of the latter is the scene of Faust's servant (*Lust* act 3, scene 4), dismayed at his impossibility (helped by the mischievousness of Mephistopheles' devil-lackeys) to take the milk off the fire before it overflows: "Au moment juste, il monte; je vas le tirer... Hein? Crac! Une idée passe par là . . . Bref, crac, l'idée! Et pfouff!... Mon lait bouillant fiche son camp comme s'il avait le diable à ses trousses" (*CE* 3:1098) ("At the very moment it's boiling, I'm going to take it off.... See? Then, snap! An idea shoots through there . . . there it goes, snap! And poof! The milk boils over and runs off as if it had the Devil at its tail"; *CW* 3:104). The passage makes full comic use of the already mentioned *psychon*.

prayer, refusing all kind of permanence in the face of the chronon, the atomic moment, and recounting the miracle of the five senses:

C'est un état suprême, où tout se résume en vivre, et qui refuse d'un sourire qui me vient, toutes les questions et toutes les réponses... VIVRE... Je ressens, je respire mon chef-d'œuvre. *Je nais de chaque instant pour chaque instant.* VIVRE!... JE RESPIRE. N'est-ce pas tout? JE RESPIRE... J'ouvre profondément *chaque fois, toujours pour la première fois*, ces ailes intérieures qui battent le temps vrai. Elles portent celui qui est, de celui qui fut à celui qui va être... JE SUIS, n'est-ce pas extraordinaire? (1056; my emphasis)⁵⁹

Lust notices his isolation, sharing the experience from the outside. The moment ends with her touch on his shoulder, a contact between independent subjects, refusing that individual intimacy for another, truer one. Here, and for a brief moment only, Faust calls her “tu” instead of “vous,” closing the interpersonal distance with his voice. This is but a momentary anticipation of the real end.

In *Le Solitaire*, in an explicitly symbolic setting, Faust and Mephistopheles reach the high peak of a barren mountain, from which the latter soon escapes. The following meeting with the Solitary, the apparently insane character who will eventually cast Faust down a chasm, proceeds by enigmas and nonsense. Valéry has given the Solitary the very role of the *Moi pur*, as clarified in the third act, the invariable “NON” in the face of a (dis)continuous external change.⁶⁰ As an act of response to all instantaneous modification, the Solitary’s detachment is a condition of symmetry acknowledging the role of chance as an *internal* factor which can only be experienced through subjective observation: “Un œil suffit à la gloire infinie... / Je le ferme et deviens la force qui vous nie...Ho ho...” (1141).⁶¹ It

⁵⁹ “This is a climax in which everything is summed up in living, and all questions and answers are rejected with a welcoming smile.... LIVING.... I feel, I breathe in my supreme achievement. *Every moment I am newborn to a fresh moment.* LIVING!... I AM BREATHING. Is that not all? BREATHING.... *At every time, each time for the first time*, I open up the interior wings that mark the true passing of time. They carry the being I am from what it is to what it will be.... I AM. Is that not extraordinary?” (*CW* 3:64; my emphasis).

⁶⁰ In the manuscripts, Valéry repeatedly declares this – e.g.: “Solitaire = *Moi Pur*. L’Invariant” (*NAF* 19038, f. 89) (“Solitary = *Moi pur*. The Invariant”).

⁶¹ “One eye takes in infinitudes of glory... / I shut it with the strength that can deny... Ho, ho....” (*CW* 3:155).

is not a pure invariance, however, but an active refuse (repulsion!) that maintains the equilibrium.⁶² Therefore, he recognises himself first as “seul de l’espèce” (1143),⁶³ then, when Faust makes him notice that everyone is alone with themselves, replies with the opposite affirmation, taken from the biblical Satan, “Que parles-tu de seul? Je suis LÉGION” (1143).⁶⁴ Although exposed in the form of a riddle, this legion recalls the implexe states that make him what he is, all the possible and superposed values that his wave function could take, existing and non-existing, virtual and still acting on the real, that “*secrète présence d’éventuels*” or “[p]luralité infraprésent” which, in 1934, Valéry imagined equidistant to a “*sensibilité supérieure*” (C 17:185; Pl 2:318):⁶⁵

On ne peut dire qu’ILS sont plusieurs... ILS sont UN et UN et UN, et ainsi et ainsi, qui ne s’additionnent pas... ILS sont si merveilleusement et justement différents l’un de l’autre, quoiqu’ILS SE composent en parfaites harmonies qu’il est impossible de LES dénombrer . . . Chacun est le plus beau de tous. Chacun est un présage, un souvenir, un signe... et non un être . . . Et tout ceci est comme une création de mon esprit, et n’est pas une création de mon esprit. (1144)⁶⁶

The implexe here takes the form of a harmonics, on which we will return. After another discussion on the incommunicability of the real (1149),⁶⁷ Faust pretends to leave, but is soon found and thrown down the chasm. He finds himself in an abyss, a reign of pure chance that represents symbolically that very infra-reign expressed by the wave function. Temporarily oblivious of his past,

⁶² “Le Moi est le noyau de l’atome H” (NAF 19040, f. 22); (“The self is the nucleus of the H atom”).

⁶³ “I’m alone . . . It’s my definition” (CW 3:159)

⁶⁴ “Why talk of alone? I’m Legion” (CW 3:159).

⁶⁵ “*secret presence of possibilities*”; “plurality-within-the-present”; “superior *sensibility*” (C/N 1:356).

⁶⁶ “You can’t say that *They* are a crowd. *They* are One and One and One, and so on and so forth, without ever adding together. *They* are so marvelously and exactly different one from another, however perfectly they assemble into harmonious unities, that it’s impossible to number *Them*. . . . Each one is the finest of all. Each is a foretaste, a souvenir, a sign... and not a being . . . And all this is like an invention of my mind, and is not an invention of my mind. (CW 3:159-61).

⁶⁷ Interestingly, the Solitary here denies the order of the star’s movements as a human construct, the same example given by De Broglie at the beginning of an article on the crisis of determinism (De Broglie [1937] 1939, 237).

he experiences a state of superposition of life and death (“Mort ou vif?... Oui? Ou non?”; 1156),⁶⁸ similar to that of the famous Schrödinger’s cat – a quantum state made explicit in the manuscripts: “Faust. Est-il vif ou mort? Incertitude” (*NAF 19038*, f. 158bis).⁶⁹ Faust himself noted it before, declaring to Mephistopheles that in the quantum reality “[l]a mort n’est plus qu’une des propriétés statistiques de cette affreuse matière vivante” (*Œ 3:1027*).⁷⁰ Here, more than everywhere else, Valéry exploits all the possibilities of that “fantastique de l’esprit” inspired by modern discoveries. The entire intermission sees Faust slowly recovering his memories thanks to the fairies, “Tisseuses du Hasard” (1162)⁷¹ and masters of this infra-reign. Faust is now a quantum image, showing the properties of his fictional (infra-)world, as much as the book and the head: wavelike entity in a wavelike subworld, not alive nor dead, without a past or a future, Faust slowly reacquires his identity and with it his individuality, regaining his past events in the right order – “Mais enfin, j’ai repris la force d’être Moi” (1163).⁷² Meanwhile, the fairies offer him a way of restarting from zero, making full use of their power to control the possible, while still in an a-historical state: “. . . Tu le connais, celui que tu peux être? / Lui seul existe ici... Tu n’es plus... que ton maître!” (1164).⁷³ Yet, Faust opts for the final denial, choosing the way of the Solitary. In this unrealistic fairy-tale reign, where all meaning is purely symbolic (see Laurenti 1991, 158), Valéry deploys enigmatic elements that ask the reader/audience to be deciphered like a thought experiment. Faust thus shows the hidden world of possibility through which human existence is actualised: starting from concepts that were formalised in early 20th century science, such model is made visible through fantastic means that are as far from common sense as is the subatomic world. The continuous reference to children’ tales and myth, and

⁶⁸ “Dead, am I? Or alive?... Yes? Or no?” (*CW 3:185*).

⁶⁹ “Faust. Is he alive or dead? Uncertainty.” Indeed, uncertainty and superposition are not *exactly* the same thing, but the latter is still a consequence of the former.

⁷⁰ “Death now is just one of the statistical properties of this frightful living substance” (*CW 3:38*).

⁷¹ “Spinners of Chance” (*CW 3:197*).

⁷² “But now my strength comes back, I am Myself again” (*CW 3:199*).

⁷³ “. . . And do you know him, [the one you can be?] / He alone now exists.... you are no longer anything / But your own master” (*CW 3:199*).

the use of the rhyming couplets (to which Faust too resorts, once he understands where he is), often in the briefer form of the nursery rhyme, call for a reconsideration, in the audience, of their basilar beliefs, and for a free play of ideas. At the same time, it hints at the hidden harmony (the superposition of waves) behind the world's nature and human experience. To this harmony we turn.

Harmonics

We have reached the nucleus of *Mon Faust*: the unfinished manuscripts containing *Le Solitaire*'s act 3 and *Lust*'s act 4. After describing the events that Valéry envisioned for these acts, I will move on to analyse the concepts behind them. In so doing, I conform to Ned Bastet's reconstruction of the plot's development.

Although Valéry probably began by considering *Le Solitaire*'s story as successive to *Lust*, the pieces almost immediately started running parallel, providing two alternative plotlines, linked in spirit, if not in the fabula's chronology (Bastet 1977, 101-2, 110). The storyworld is hence doubly unfinished, split into two parallel routes which irrationally recall each other by opposition, both preparing but not reaching a publishable narrative conclusion. As for the composition, while, in March 1941, it is the third act of *Le Solitaire* that has almost all of Valéry's attention, the time between the half of that year and the end of the next one is dedicated to the fourth act of *Lust*, which becomes the main means to express his final ideas (114 ff.). In the *Solitaire*, the planned plot envisions Mephistopheles and an Archangel, fighting for the ownership of Faust's senseless body at the mountain's foothills. The Solitary sends them away, reviving Faust and revealing him that they are the same "Moi": a final, specular, theatrically irrepresentable union into a single self. *Lust*, instead, was first conceived as a way for Faust to free himself from his last erotic ties to the world, only to take afterwards a completely different path. After a first scene starting with Mephistopheles trying, with his henchman's help, to influence Lust's dreams, it continues with Lust's poetic prayer to the dawning day, to then dispatch the disciple (a minor character who Mephistopheles previously tried to

couple with Lust)⁷⁴ and, lastly, present a dialogue (or, musically, a “Duo”) between Faust and Lust (see the plans in *NAF 19037*, ff. 69-72). For this final “grand scène,” Valéry thought at first of a farewell between the two: she irremediably in love with him, he decisive in his attempt to end his existence, they would repeat the model of the *lebwohl* between Wotan and Brunhilde in Wagner’s *The Valkyrie*. Eventually, however, this scene of defeat developed into one in which the two would realise a superior form of love in an eternal moment of fusion/confusion of bodies and minds. To Bastet, Valéry eventually turned to the pattern of Wagner’s *Tristan and Isolde* (1977, 124 ff.).

In both cases, the definitive conclusion, of the story as of Faust’s life, is found in an identification of subject and object. Self and Other are now indistinguishable, not only acting as one, but being one, like the wavelike components of reality claimed by Langevin and Planck and pertaining to an out-of-the-world(ing) experience. This obviously clashed with the possibilities of theatrical representation, reaching an impasse that limited the resolution of the plot to a kind of imagery that could only be conjured linguistically, and incompletely so: as Faust said to the fairies, reformulating the Solitary’s words, “[l]e véritable vrai n’est jamais qu’ineffable” (*Œ* 3:1166).⁷⁵ This displacement into a higher virtuality, aiming at a quasi-religious participation while refusing its theological connotations, is what Valéry called the “mystique sans dieu” (*NAF 19037*, f. 6).⁷⁶ It connects a rare form of love to the “inexprimable, qui est l’objet de tout art supérieur” (f. 6),⁷⁷ thus trying to make it appreciable in the guise of aesthetic sensation.

Such is the core of Valéry’s late thought, reachable through a fundamental yet polysemous term: the “harmoniques” (“harmonics”). The concept comes back to at least the beginning of the century, but is developed more precisely in 1941, to express the metaphysical aspects of aesthetic sensation. Valéry explicitly links it to all the main characters of *Mon Faust*. In 1941, he notes:

⁷⁴ This particular scene is barely developed, but Valéry apparently expected him to hang himself (*NAF 19037*, f. 67).

⁷⁵ “The truth within the truth remains ineffable” (*CW* 3:205).

⁷⁶ “Godless mysticism.”

⁷⁷ “The inexpressible, which is the object of all superior art.”

– Quant aux «harmoniques» – (que je représente par le *Solitaire*, et par les *Fées*) ce sont ces valeurs supérieures de la Sensibilité, *qui s'ordonnent en groupes* (au sens quasi-mathématique du mot) et qui sont la *structure abstraite* de nos modifications les plus *concrètes* – les *sensations en soi, au-dessus de toute signification*, et au-dessus de toute *condition accidentelle* de leur production fragmentaire.

C'est l'Art qui a pour fonction de révéler ces groupes. Le groupe de couleurs, de sons, de figures etc. (C 26:442, Pl 1:306)⁷⁸

Similarly, Faust prospects to Lust (or vice versa, it is impossible to know) the result of their superior love: “Nous serions comme des dieux, des harmoniques intelligents . . . n'est[-]ce pas là le sommet de la Poésie, qui n'est après tout que tentative de communion?” (NAF 19037, f. 33; Valéry 1977, 82).^{79,80}

Just from these passages, we already understand that harmonics are connected to the senses, such as sight and hearing, but bring them back to a state of ordered virtuality. As Régine Pietra has precised, they relate to an “*ontologie du sensible*,” in a sense to the actual operations of reception and response of the nervous system, yet must soon abandon it to proceed in a purified and self-developing “*enceinte mentale*” (1991, 178).⁸¹ Building on that, it can be said that the harmonics allow to experience the *call of the virtual* from the actual, the engendered feeling of a close but perchance infinite system (in this sense a mathematical group), developing in a sequence of tones. Such tones, to use the language of mathematics, physics, and music from which Valéry was constructing his idea,

⁷⁸ “– As for the ‘harmonics’ – (which I portray by the *Solitary One* and by the *Fairies* –) they are those superior values of the Sensibility, *which are ordered in groups* (in the almost mathematical sense of the word) and which are the *abstract structure* of our most *concrete* changes – *sensations in themselves, beyond all meaning*, and beyond any *accidental condition* bearing on their fragmentary production.

It is the function of Art to reveal these groups – The group of colours, of sounds, of perceptible forms etc.” (C/N 2:449).

⁷⁹ “We will be like gods, intelligent harmonics . . . isn't it there the peak of all Poetry, which is after all nothing but an attempt at communion?”

⁸⁰ I clarify here (and in the future, whenever possible) both the position in Valéry's manuscripts and in the partial transcription of *Lust's* act 4 by Ned Bastet in Valéry (1977). In case of variants, the quoted text always comes from the manuscripts.

⁸¹ “[O]ntology of the sensible”; “mental enclosure.”

are expressible as integers multiples of a fundamental frequency, thus as a sum of vibrations making up a superposition of sinusoidal waves, each (in the case of light) corresponding to a simple colour. If we connect these characteristics, considering that these experiences are both physical and abstract, mathematical and phenomenal, we find ourselves back, once again, to the wave function. After all, De Broglie too explained the pre-observational quantum superposition of states in the wave function by starting from the Fourier series, a mathematical tool of harmonic analysis to calculate light's potential superposed monochromatic components, which would appear only after passing through a prism (see [1937] 1939, 262 ff.). And after all, the feeling of the harmonics is connected by Valéry, to a specific form of implexe “dont le développement donnerait, par substitutions *propres*, une succession complète ou parfaite d'états, un cycle du possible sensoriel fermé” (C 29:50-51; *Pl* 1:1205).⁸² Régine Pietra, too, in explaining how the notion evolved throughout the years – from an energetic, to a geometrical, to a mystical and metaphysical character – made an analogy with a passage from a classical wavelike, to a corpuscular, to a wave-mechanical point of view (1991, 172-73). Valéry would have perfectly agreed with that, as he reasoned in these exact same terms in March 1941 to talk about the effect of harmonics in *Mon Faust* as pertaining exclusively to aesthetics. While beauty, to him, produces

Un “infini” de désir régénéré par la possession . . .

[L'œuvre] veut d'autre part, *croyance* . . . qui rend le sujet consommateur participant à l'action, de toute sa personne. Il vit une autre vie. Mais dans l'emploi de la «beauté», il n'en est pas ainsi. (C'est *l'onde* qui agit – et non le *corpuscule*.) Il y a constitution d'un état *intrinsèque* – sans référence au réel, sans *fin* à atteindre, – *même quand une représentation du réel est employée*. Ce réel devient alors une partie d'un système harmonique – *et ses choses aussi bien engendrées par la forme que la forme par elles* . . . c'est à dire un suspens dans l'état où *l'improbable devient fonctionnement*. (C 24:364-65)⁸³

⁸² “[W]hose development would produce, by means of *appropriate* substitutions, a complete or perfect succession of states, a closed cycle of sensory possibility” (C/N 3:349).

⁸³ “An ‘infinity’ of desire regenerated by its own possession . . .

This was not an isolated analogy for him, but the result of a decennial reflection on the effects of poetic art and form.⁸⁴ Especially from the point of view of *Le Solitaire*, taking into account what has already been said about Valéry's analogies between the old man, the "Moi," and the atom, as well as Valéry's deep-rooted interest for black-body radiation, the further link between the self and the atom as a quantum harmonic oscillator, with its manifold of possible energy levels, comes almost automatic.⁸⁵ Close to the end of his life, in a France thrown into chaos by war and occupation, Valéry purifies and emphasises to the extreme his aesthetic foundations, reaching for the final artistic experience. His recurring thought of the mind as a black body, irradiating and receiving thoughts and sensations like an electron with quantised energy, comes here to its utmost completion: accessing the *Moi pur* requires possessing the totality of the self's possible states, feeling all their superposed harmonic potentialities in their infinite development, abstracted from yet linked to the individual elements of the here and now. This, in turn, leads to recognising that *something unnameable and unchanging* – an atomic core – is beyond all their possible evolutions, and yet only exists as their counter-action, as a part of them. It is a two-step process: from sensation to virtuality, from virtuality

[The work] needs, on the other hand, belief . . . which makes the consuming subject a participant in the action, with all himself. He lives another life. Yet, in the use of «beauty» it's not like that. (It is *the wave* which acts – and not the *corpuscle*.) You find there the constitution of an *intrinsic* state – without reference to the real, without an *end* to reach, – *even when you are employing a representation of reality*. Such real becomes now a part of a harmonic system – *and its beings created by form as much as form is created by them* . . . that is to say, a suspension in the state where *the improbable becomes function*.”

⁸⁴ Thus in 1927, with clear conscience of the most recent discoveries: “Poésie – – Mécanique ondulatoire! / Elle est en somme l'usage, le fait de suivre etc. les événements, perceptions par leur onde – Percevoir l'onde plus que le corps . . . Usage et combinaisons des valeurs de résonance, des harmoniques et de leurs rapports – au détriment des valeurs de substitution finies” (*C* 12:275; *Pl* 2:1111) (“Poetry – – Wave mechanics! / It is fundamentally the practice, the fact of observing etc. events, perceptions, in terms of their waves – To perceive the wave rather than the body . . . Using and combining resonance values, harmonics and their relationships – at the expense of finite substitution values”; *C/N* 2:213).

⁸⁵ The undulatory character of the harmonics (which are, after all, the masters of possibility) is clear in the notes to *Mon Faust*, where Valéry annotates: “Lutte des harmoniques ou ondulatoires contre les individualisations” (“Fight of the harmonics or undulatories against individualisations; *NAF* 19040, 8). Once again, the topic is in line with the 1930 discussion on particle-wave duality.

to a new, all-encompassing individuality, one that cannot but require a non-classical form of logic. Thus, Valéry tries to reach the nucleus of human experience not through psychology, but through a physics of shared aesthetic experience. Catching a glimpse of the *Moi pur* is the effect of art, obtained through the joint effort of the artist and the audience, the former initiating the spark of the harmonics, the latter tapping into it and actively sustaining it. Moving to that state permanently, however, cannot but result in the complete cancellation of the self for which Faust is longing. Valéry annotates:

Le Moi repousse tout – l'Anti Pan

et c'est la condition de son identité et du retour au Zéro, par quoi se conserve le possible

...

Tout le reste est nié, niable –

Je ne suis pas ceci, cela – ma pensée, mon histoire, mon désir – tout cela n'est que du... temps. (*NAF*

19040, 20)⁸⁶

In the same page, the Solitary tells Mephisto “je suis le seul unique et le réciproque de toute la vibration du monde” (20).⁸⁷ From the *Moi pur*'s negation of the actual to its wavelike universality, from its atomic and harmonic character to the effect of the chronon on its actuality: all is in these few lines.

The Solitary's final union with Faust represents, around 1941, the first form of this harmonic process, in which Faust meets his own, symbolical, inner part. Fusing with the Solitary/*Moi pur*, he resolves himself into a virtuality that refuses incarnation and repels actualisation. A wave saved from its collapse, remaining above history:

⁸⁶ “The Moi repels everything – the Anti-Pan

And that is the condition of its identity and of the return to the Zero, by which the possible is preserved.

...

All the rest is denied, deniable –

I am not this, that, my thought, my history, my desire – all that is but... time.”

⁸⁷ “I am the only unique and the reciprocal of the whole world's vibration.”

FAUST. Il y a donc q[uel]q[ue] chose qui est au-dessus de la vie. Refuser la vie et la mort.

SOLITAIRE. Il y a l'indomptable, l'essence du réveil d'entre les vivants. Ce qui meurt pour toutes les choses qui naissent. (NAF 19038, f. 95)⁸⁸

Yet, *Lust* eventually changes everything. While the Solitary's experience is offered by the joining of the alterity in oneself, an individualised de-individualisation, *Lust's* project, in its final form, strengthens the value of the Other, now more actual than symbolical. Through a superior eros connecting mind and senses, it envisions a communion allowing for the highest aesthetic experience: "L'idée de fond, c'est la transmutation de l'amour en Œuvre . . . La rupture du dissemblable du *Moi*" (NAF 19037, f. 93).⁸⁹ To Paul Gifford, looking at *Le Solitaire* and *Lust* through the lens of eschatological mysticism, against the former play's "via negationis" of purity and refuse of mystical desire (1991, 147), the latter would enact the model of the union with God, now impaired, however, by the lack of the Other's divinity, to restore "le paradis perdu de l'Harmonieuse MOI" (155).⁹⁰ This tassel can be added to Valéry's own unified theory, which we have seen joining the Mallarméan totalising aesthetics, the music of Wagner, and the quantum mechanical model. And *Lust's* very objective of the *Moi's* lost paradise hinted at by Gifford should recall the condition of a-historicity that we have already found clearly delineated in *Le Solitaire*, with the fundamental addition of the (super-)erotic link between two *esprits*. The quoted harmonic "communion" allows to find one's own essence not in oneself, but in the other. As Bastet wrote: "C'est entre ces 'essences' que devrait se réaliser ce que l'expérience et la vie dénie à nos moi ordinaires: un 'accord harmonique'" (1977, 129).⁹¹ In fact, *Lust* reconjures all the themes of *Le Solitaire*, yet projects them more explicitly onto

⁸⁸ "FAUST. There is something, then, above life. To refuse life and death.

SOLITARY. There is the indomitable, the essence of awakening among the living. That which dies for everything that is born."

⁸⁹ "The idea at the base is the transformation of love into Artwork . . . the rupture of the difference of the *Self*."

⁹⁰ "The paradise lost of the Harmonious SELF."

⁹¹ "It is between these 'essences' that what experience and life deny to our ordinary selves shall be realised: a 'harmonical accord'."

the outside, onto a metaphysics of human relations: the superposition of voices and selves – not purely musical, as Bastet viewed it, but more deeply ontological; the loss of individuality that brings about the feeling of the formal wave behind the events; the wave’s transmutation onto an a-historical plane, towards an infinity outside of time; and the artistic character of such experience. A kiss signs the new state:

Entre nous, Lust, entre nous, qu’y a-t-il entre vous et moi? Paroles, paroles... Mais voici que tout ce qui se dit entre nous, nous ne savons plus qui le dit, de vous ou de moi.

Il n’y a plus de pensée entre nous, la pensée est différence . . . O mystère... nous nous éveillons d’être deux . . . Au plus haut de l’amour, au-delà de l’amour, il y a cet extrême de l’être[:] l’extrême de l’autre. Il n’est de paroles ni de caresses ni d’étreintes qui épuisent cette volonté inconcevable de n’être pas deux mais un... (NAF 19037, ff. 18-19; Valéry 1977, 80-81)⁹²

Made into “harmoniques intelligents” reworking the communion “au sommet de toute Poésie,” Faust and Lust will make “des moments – comme on procréé – des moments qui seraient dérobés au désordre de la vie ordinaire qui est accidentelle et faite de morceaux et d’inachevé – moments d’éternité” (f. 33; Valéry 1977, 82).⁹³ And in these moments of highest love, as shown in a variant, “tout ce qui n[ou]s ferait penser à nous, c[’est]-à-d[ire] à un lendemain – car que sommes-n[ou]s communément qu’un lendemain – doit être repoussé, refusé” (f. 59; Valéry 1977, 79-80).⁹⁴ Once again, life shall be lived “une fois pour toutes” (f. 95),⁹⁵ brought to the extreme of its conclusion into an epiphanic finale: indeed, an eschatology through the fusion of minds and bodies, an adventure in

⁹² “Between us, Lust, between us, what is there between you and me? Words, words... but here is that all that is said between us, we no more know who is saying it, you or me. There is no more thought between us, for thought is difference . . . O mystery, we wake up from being two . . . At the highest of love, beyond love, there is this extreme of being: the extreme of the Other. There are no words or caresses or embraces which exhaust this will of being not two but one...”

⁹³ “[M]oments – like procreation – moments which will be stolen from the disorder of ordinary life, which is accidental and made of pieces and of unfinished – moments of eternity.”

⁹⁴ “[E]verything that will make us think of us, that is of a tomorrow – for what are we together if not a tomorrow – must be repelled, refused.”

⁹⁵ “[O]nce and for all.”

the virtual system of harmonic possibilities. Even if Valéry believed in the universal value of his “grand scène” – raising his characters to the rank of “grandes Puissances,” abstractions of “les EGO, les impulsions” (f. 83)⁹⁶ – the departure from the symbolically represented internal dialogue between the Solitary and Faust, two aspects of the same being, evolves the model of the single atom into one of a composite system. Its components start from the material and carnal union of the bodies, and from that corporeal state are translated into something indistinguishable.⁹⁷ If we take the point of view of that active audience that Valéry was anticipating for his theory, the two characters’ relation seems to partially resemble a state of quantum entanglement. Envisioned as a possibility since 1935, it involves two particles which, after having been in contact, are joined in a system whose wave function, although knowable in itself within the limits of uncertainty, does not tell anything about *which* is in one state or its opposite: the combinations of opposite states are in superposition. Only by observing one of the particles can one assign it an eigenvalue, thus conferring the opposite value to the other (Faust/Lust, man/woman, speaking/silent) without the need to interact with it (by a sort of action-at-distance).⁹⁸ This is exactly what Valéry wants to deny to the audience’s observation. Again, the impossibility of distinguishing the two is equivalent to the refusal of a collapse.

It becomes clear, thus, that the storyworlds of *Lust* and of the *Solitary* are not only incomplete for lack of theatrical ways to express them – how to detach the audience’s gaze from the individuality of the actors? – but also because they both conclude by refusing to resolve the suspension between one fraction of actuality and the next. The new moment is an infinite moment, not in a temporal but in an artificial, and almost purely mathematical sense.

The very unimaginability of quantum physics thus helps exploring and conceptualising, by way of a blending between different fields, the system of possibilities which is behind the real. It can do

⁹⁶ “[G]rand Powers”; “the EGOs, the impulses.”

⁹⁷ This reproduces, once again, the developing process of the harmonics. Valéry, in those years, often reflected on the value of sexual intercourse as a means for aesthetic experience: “La jouissance est une promesse – *un commencement*” (C 28:819; Pl 2:549) (“Enjoyment is a promise – *a beginning*”; C/N 1:575).

⁹⁸ This is called a singlet state. More information in ch. 3.4.

so with single “quantum images,” to be used both as thought-experimental models for world analysis and as metafictional tools to show life’s inherent chaos, and the artificiality of linear narration. In this sense, such epistemological effort anticipates later postmodern metaleptic techniques. Yet, it can also be taken as far as possible, to express the very sensation of that virtuality, a Godless mysticism, by providing a quantum model that can tap into its negative theology. The final objective of such effort is to be found in a few scribbled words, dating 1944: “Avant la vie, y a-t-il un état inconcevable? Et le possible est-il une sorte de réalité? . . . Peut-être la seule réalité” (*NAF 19038*, f. 154).⁹⁹

⁹⁹ “Before life, is there an inconceivable state? And is possibility a sort of reality? . . . Maybe the only reality.”

The Complementarity of Fact and Fiction

Woolf's Between the Acts

Reading Valéry's *Mon Faust*, I noted the value of the audience's presence and its role in the creation of a shared artistic experience made of a non-collapsing superposition of sound, meaning, and images. Nonetheless, Faust's identity, with its overwhelming role as the play's thematic centre, required an almost undivided attention and called for a reflection on pure art that verged on the mystical. Instead, Woolf's last novel *Between the Acts* (1938-41), seen through a quantum lens, allows us to focus on the audience, its observer role, and the political value conferred to observation.

Woolf's parallelisms with quantum physics have been explored through various avenues, especially with regards to *To the Lighthouse* and *The Waves*. As Jennifer Burwell remarked (2018, ch. 3), the results are not always felicitous, sometimes for lack of precision in the use of the concepts or in the historical connections between Woolf and the theories.¹ Nonetheless, more recent accounts – such as Rachel Crossland's (2018, 45-69) about *Orlando*; and Catriona Livingstone's (2022, 39-78) about *The Waves* – are solidly based on Woolf's own knowledge and cultural environment, laying

¹ For *To the Lighthouse*, see for example Clark (1989), as well as the already quoted Hussey (1995) and Brown (2009; see here ch. 2.3, 165 n. 1). Among the readings of *The Waves*, Friedman and Donley (1985, 143 ff.) is still a very good account, especially for what regards the formal aspects of the novel; Vargish and Mook (1999, 121-22) expand on the latter, focusing on the field model applied to character treatment; Derek Ryan (2013, ch. 5) uses quantum mechanics to attempt a posthuman reading; Daphne Grace (2014, ch. 5) reads the text loosely through the concept of entanglement, although Woolf could very hardly know it; Ian Ettinger (2015) connects the questions of identity and wave/particle duality. See Burwell (2018, 129 ff.) for a critique of some of these works and for further examples.

dependable foundations for further research. Both profitably examine the concept of selfhood in Woolf through quantum complementarity and wave-particle duality, focusing on the connections between observation and identity advocated as profitable also by Burwell (2018, 140). Drawing on Crossland's research, I would like to consider the relation between complementarity and the ontologically relevant distinction between fact and fiction in *Between the Acts*.² While complementarity, as a concept, can be fruitful in itself for the analysis, I argue that it reached Woolf transversally through her reception of specific trends in British scientific popularisation, thus partially differing from Niels Bohr's conception (for which see here, ch. 3.1 and 3.4). Woolf could integrate complementarity into a system that was already in place and partially supported (at least through metaphorical chains) by previous physical notions. In this way, I will distinguish fact and fiction in Woolf as ontologically detached categories (related to discontinuity and continuity, respectively) which, though unable to be considered together, are mutually influencing each other. My reading will hinge on the idea of interruption as a politically relevant possibility of collapsing and reconfiguring fiction by means of facts (and vice versa). Finally, with the help of Valéry's harmonics, I will define the value of art in the refusal of collapsing the function, thus enabling semantic superposition as a free and continuously constructive form of knowledge. We should however always remember that physics could only be but a trend of Woolf's various interests, and that she almost never accepted official knowledge blindly, but creatively reformulated it.

In what follows, I will first portray Woolf's cultural field of force with relation to quantum physics, then proceed to define what fact and fiction are in Woolf's own conception, and how they are related. Afterwards, I will move to textual analysis from the point of view of complementarity, to arrive at the role of art in Woolf's late works.

² A few others have followed different directions in studying *Between the Acts* and quantum physics. In particular, Westling (1999) on the connections between Woolf, quanta, and Merleau-Ponty; and Pridmore-Brown (1998) on quantum mechanics with relation to radio and politics. My reading will only partially collide with the latter.

Woolf, Quantum Physics, and British Popularisation.

When discussing Woolf's possible knowledge of physics, the three main scientists to account for are Arthur Eddington, James Jeans, and George P. Thomson. The first two produced best-sellers which stirred the public in the 1920s and '30s with their philosophical ideas as much as the quality of their explanations (see Bowler 2009, 99-103). In *Between the Acts*, they appear among Isabella's possible readings in the Oliver family's library, thus entering the world's fictional encyclopaedia: "Or not a life at all, but science – Eddington, Darwin, or Jeans" (*BA* 14). The reference is, most probably, to Eddington's *The Nature of the Physical World* (1928) and Jeans' *The Mysterious Universe* (1930). Gillian Beer has written extensively on their influence on Woolf (1996b, ch. 6). In particular, the final chapter of Jeans' previous work (*The Universe Around Us*; 1929) is quoted by Woolf in her diary (*D* 4:65-66), and she possessed a copy of *The Mysterious Universe*'s first edition, which she quoted in *The Waves* (see Henry 2003, 101).³ She also bought her own personal copy of the fourth edition in 1937, a year before starting the novel (*D* 5:107). Finally, the Woolfs had a copy of Thomson's *The Atom* (1930; see King and Miletic-Vejzovic 2003) which, although less widely sold, remained the account of one of the main British actors in the field.

Along with various reviews appearing in the *Nation & Athenaeum*, of which Leonard was literary editor until 1930, Livingstone (2022, 48-49) has emphasised BBC broadcasts' role for scientific popularisation, and Woolf's engagement with it, as well as the fact that some works published by Hogarth Press (including Vita Sackville-West's *The Dark Island*, in 1934) were informed by the new physics. This shows that such topics were at least considered within Woolf's circle. Nonetheless, Eddington, Jeans and Thomson already supply a well-explained and substantially coherent account

³ Specifically, the passage refers to the theory of the planets' formation from the Sun's matter, by attraction of a passing star, which Jeans provides at the beginning of his work ([1930] 1937, 11-13) and Bernard recounts in *TW* 172.

of current quantum physics before *Between the Acts*.⁴ All three mainly focussed on wave mechanics, i.e., the theories of De Broglie and Schrödinger on the wave function, as the branch seemed the most congenial to British physicists, and the easiest to expound without mathematics. Although Eddington had various reservations, Thomson and Jeans accepted wave mechanics enthusiastically, to the point that Jeans distilled it into a kind of mathematical idealism for which “nature and our conscious mathematical minds work according to the same laws” ([1930] 1937, 167). In all three, the wave function (mathematically developed in a possibly infinite-dimensional configuration space) is described as something pertaining to a different ontological space, which nonetheless has a relation to the actual world. Eddington, although sceptical in general about what physics can say objectively, asked his reader to imagine “a sub-aether whose surface is covered with ripples” vibrating so fast that we can only observe their “combined effect” ([1928] 1929, 211), thus implicitly relating it to a kind of invisible reality. Thomson wrote that “though the waves themselves fade into multi-dimensional ghosts, the probability which can be deduced from them mathematically remains a sober reality in three dimensions” (1930, 202). And Jeans, most importantly, admitted that

all the pictures which science now draws of nature . . . are mathematical pictures. Most scientists would agree that they are nothing more than pictures – fictions if you like, if by fiction you mean that science is not yet in contact with ultimate reality. (1937, 153)

⁴ In Thomson, moreover, Woolf would have found a particularly visual account of the main experiments in the field. A couple of examples are Rutherford’s gold-foil experiment (Thomson 1930, 146) and the description of the photoelectric effect (164). Thomson’s almost pictorial descriptions would have probably struck a chord with Woolf’s personal taste. Among the most noticeable cases is Davisson and Germer’s foundational experiment on electron diffraction. Here is a taste of Thomson’s style: “When electrons are used instead of X-rays . . . it is necessary to use extremely thin films less than a millionth of an inch in thickness. Such films are highly transparent. They offer no more obstruction to the light than a piece of slightly tinted glass; if held close to the eye one can see through them the individual bricks of a building across the road” (181).

Thus, he directly referred to a fictional mathematical world which seems to hold the key for real events, fuelling his mathematical idealism.⁵ All authors explained that the wave function represented the experimenter knowledge in terms of probability, and defined the dual nature of particles and radiation. Thus, although none of them named Bohr's complementarity explicitly, or cared to explain it specifically, they all described a sort of split ontology: on the one hand, they posed experience, made of real events and signs on photographic plates; on the other hand, they sketched a wavelike and purely mental world, made of virtual multidimensional mathematical elements that had little to do with matter and that had to be reconfigured at any new event, yet opened the human mind to the weavings of fate. The two pictures were in themselves incompatible and yet mutually influencing.

We can find other common features: firstly, both Eddington ([1928] 1929, 215-216) and Thomson (1930, 200-201) clarified quantum superposition by comparing it with sound superposition in musical beats. Secondly, all the authors saw the new indeterminism of quantum physics as introducing a form of free will within the scientific discourse.⁶ Jeans, interestingly, also made a parallel between indeterministic particle behaviour and single minds, in opposition to macroscopical determinism and the actions of a crowd (1937, 30). This was but one of various blends enacted to illustrate physics through contemporary psychology and biology, drawing on the electrical nature of

⁵ In line with this trend, Eddington opens *New Pathways in Science* (1935, from a lecture cycle given in 1934) by distinguishing between a story told to each human being by their minds, receiving sensory experience, and one told by physics. He defends keeping the value of both: "The story teller in our consciousness relates a drama – let us say, the *Tragedy of Hamlet* . . . [the scientist] knows the unreliability of these play-writers. Nevertheless he follows this play attentively, keenly alert for the scraps of cypher that it contains . . . I would admit . . . that consciousness with its strange imaginings has some business in hand beyond the comprehension of the cypher expert" (1935, 8). He also titles his second chapter, where he describes the main elements of study in physics, "*Dramatis Personae*," adding an epigraph from Shakespeare's *The Tempest* (27).

⁶ Thus Eddington: "[W]e may note that science thereby withdraws its moral opposition to free-will" ([1928] 1929, 295); Thomson: "[P]hysics . . . is moving away from the rigid determinism of older materialism into something vaguely approaching a conception of free will" (1930, 191); Jeans: "[T]his picture [of the quantum universe] contains more room than did the old mechanical picture for life and consciousness to exist within the picture itself, together with the attributes which we commonly associate with them, such as free-will, and the capacity to make the universe in some small degree different by our presence" (1937, 43).

the nervous system. Jeans, for example, defined the effect of electromagnetic fields by asking the reader to imagine “tentacles” around particles pushing and pulling each other (71-72); Thomson explained atomic valency through “tags of string” linking atoms in chemical reactions (1930, 50), and even more graphically described atoms guided by the wave function as “tiny gossamer spiders which drift through the air, each at the centre of a number of diverging filaments” (184); Eddington more explicitly linked external world and perception through the nervous system: “We are acquainted with an external world because its fibres run into our consciousness” ([1927] 1928, 278). Livingstone has studied how *Between the Acts* displays a wealth of metaphorical images that relate treads and filaments to sensation, and looked at the text through the lens of Woolf’s contemporary neurological discourse (2022, ch. 2). Such imagery, as these quotations show, was largely used even in the physical sciences, reinforcing the cultural connection between individual (and crowd) psychology, neurology, biology, and electromagnetism. When, in *Between the Acts*, the narrator names Darwin *between* Eddington and Jeans (14), the choice might not be casual.

To recapitulate, complementarity as shown in these popularisations takes the form of a paradoxical mutual incompatibility and influence between two different ontological states, one pertaining to the mental (and continuous) world of mathematical waves, the other to the material (and discontinuous) world of physical events, particles, and radiations. Let us look now at Woolf.

Fact and Fiction in Woolf

As noted by Crossland about *Orlando* (2018, 53-55), fact and fiction in Woolf can be related through complementarity in the physical sense. Although Crossland states that complementarity became a problem for the physicists since De Broglie’s thesis on the wavelike nature of particles in 1925, it was only at the Como congress in September 1927 that Niels Bohr officially introduced the concept to the larger scientific community (see ch. 3.4, 314 ff.). Nonetheless, it is true that the dualistic nature of light alone had been an issue since Einstein’s 1905 paper on the photoelectric effect (“On a

Heuristic Point of View Concerning the Production and Transformation of Light”), both within the laboratory and in the popular explanations. More generally, it is “clear that dualistic images had some special meaning for both Virginia Woolf and the wider society of which she was a part” (Crossland 2018, 41), so that Michael Whitworth’s idea that Woolf defined her own dualism “in anticipation of the physicists” (2001, 162) should be corrected. Crossland prefers to talk about “coalescence” of ideas between different fields (2018, 63), which seems to better portray the situation. All in all, I would say, in extension and partial correction to Crossland’s research, that Woolf moved from duality to complementarity on her own, yet leaning on physical ideas that seemed to foreground it, and that the world-vision portrayed in later physical popularisations could not but resonate and enrich her thought. Moreover, the very notion of what fact and fiction are for Woolf needs further clarification. Let us go by order.

In the essay “The New Biography,” published at the end of October 1927, Woolf begins by praising the “hard facts” that constitute the building blocks of Sidney Lee’s biographies:

For there is a virtue in truth; it has an almost mystic power. Like radium, it seems able to give off for ever and ever grains of energy, atoms of light. It stimulates the mind, which is endowed with a curious susceptibility in this direction as no fiction, however artful or highly coloured can stimulate it. (*E* 4:473)

The radium simile hinges on radioactive decay, and the precisely sketched “grains of energy, atoms of light” (i.e., gamma-rays) recall the discrete quantic nature of radiation revealed by Einstein’s paper.⁷ Nonetheless, Woolf soon detaches such immaterial quality from the solidity of fact alone, declaring Lee’s biographies “dull” and “unreadable” (473). As a counterexample, she proposes Harold Nicholson’s *Some People* (1927), who succeeds in the enterprise by using the means of fiction

⁷ But see also the whole ch. 1.3 for the conceptual blending with epicurean atomism and the metaphorical use of radium in *To the Lighthouse*’s drafts.

in his exposition of the personalities of his characters, without letting it overcome the reality of facts.

Both have positive value, yet they cannot be allowed to collide:

[Nicholson] is trying to mix the truth of real life and the truth of fiction. He can only do it by using no more than a pinch of either. For though both truths are genuine, they are antagonistic; let them meet and they destroy each other . . . The imagination will not serve under two masters simultaneously. (477-78)

In other words, Woolf is here establishing two parallel alethic paradigms, reflecting the evaluation of two cognitive stances. These are complementary and exclusive, exactly like the wave-like and particle-like world-pictures. Although not related to complementarity directly (as Crossland seems instead to hint: 2018, 53),⁸ the scheme impinges on the nature of radioactive decay, in which radiation (that is, fiction in fact) derives from matter disintegration. Importantly, the move is applied specularly to the reading of pure fiction. Thus, in “The Novels of Turgenev” (December 1933), Woolf praises the author’s rare ability to “combine fact and vision” so as to allow both observation and interpretation, in such a way that “the interpreter is never allowed to mount unchecked into the realms of imagination; again the observer pulls him back and reminds him of the *other truth*, the truth of fact” (*E* 6:11; my emphasis). Once more, this work of “balance” shows different alethic systems at work without letting one side leak into the other. As a result, Turgenev’s novels produce a “succession of emotions radiating from some character at the centre” while such character “acts as a magnet which has the power to draw things . . . together” (12). Fiction (in this case connected to emotional response and sense of belonging) is connected to irradiation and electromagnetic phenomena.⁹

⁸ This model is already present before 1927. See for example “How Should One Read a Book?” (October 1926), where the metaphor is related, almost as poignantly, to direct observation: “To ask a biographer to give us the same kind of pleasure that we get from a novelist is to misuse and misread him. Directly he says ‘John Jones was born at five-thirty in the morning of August 13, 1862,’ he has committed himself, focused his lens upon fact, and if he then begins to romance, the perspective becomes blurred, we grow suspicious, and our faith in his integrity as a writer is destroyed” (*E* 4:394-95).

⁹ For a similar and previous analysis of Proust see Crossland (2018, 54). As she writes, Woolf tried and failed to use a similar model in the composition of *The Years*.

In brief, Woolf recognises the fictions necessary to fact, as well as the facts necessary to fiction, and assigns a double truth-value mode to both. Helping the exposition of her own poetics through concepts related to radioactivity, she reaches a kind of double vision that, being in line with later quantum complementarity, could successively resonate with its popular expositions. This process is similar to Valéry's literary expression of the wave function starting from Mallarmé's poetics (see ch. 3.2, 241 ff.). Moreover, Woolf's notion of fiction seems to be rather open, as she assigns a more preponderant role to the *fictio* (i.e., the presentation of events) than to the *fictum* (the invented content).¹⁰ She is also more attentive to the effects on the readers' imagination, to the point of distinguishing two necessary and incompatible mental attitudes to experience narratives (be them biographical, historical, poetic, or properly fictional). Woolf maintained her opinion throughout the years: in the article "The Art of Biography" (April 1939), she considered Lytton Strachey's work on queen Elizabeth as a failure exactly because he refused to keep separate the biographer's facts (true by public acceptance) and the artist's (true by fidelity to the author's "vision"): "[T]he two kinds of facts will not mix; if they touch they destroy each other" (*E* 6:185). In the BBC talk "Craftmanship" (published in the *Listener* in May 1937), she even postulated, half- (but I believe only half) joking, "that in time to come writers will have two languages at their service; one for fact, one for fiction" (93). The former, in particular, will be a univocal language of signs, fit for guidebooks such as the Michelin guides, or the 19th century Baedeker guide, which evaluates even artworks: "When he wishes to say that a picture is good, [Baedeker] uses one star; if very good, two stars. When, in his opinion, it is a work of transcendent genius, three black stars shine on the page, and that is all" (93). This could also be applied to factual parts in novels.

Finally, what kind of experience does fiction bring about? With the preconditions stated before, Woolf seems close to the ideas of fictional worlds theory. In "Anon" (1939-41), her last, incomplete

¹⁰ See Fludernik (2006, 58-60). Fludernik defines fiction as anthropocentrically oriented towards communicating human experience. I believe that Woolf would have agreed, but also have taken a more reader-oriented approach, drawing the line not at the kind of experience that is communicated, but at the one that is lived in the reader's mind.

essay written along with *Between the Acts*, she describes the mental state of the Elizabethan play's audience through what seems like Marie-Laure Ryan's concept of recentering (see introduction, 20): "At last one man speaks in his own person . . . The world takes shape behind him. Egypt and Libya and Persia and Greece rise up. Kings and Emperors stride forth" (*E* 6:593). Once the novel takes the place of the play, "[t]hat theatre must be replaced by the theatre of the brain" (599). It is in this sense, I believe, that we can recognise that specific side of imagination that Woolf's assigns to fiction: the creation of a mental world with its own alethic mode, separated from the world of facts yet related to it through mutual, if indirect, influence. From the premise of this complementarity of worlds, we turn to *Between the Acts*.

Complementarity in *Between the Acts*

Woolf wrote and revised *Between the Acts* between April 1938 and the end of February 1941. Its composition is parallel to *Roger Fry: A Biography* (published in July 1940) – indeed, the novel was a way to "relieve" herself from the other, more systematic work (*D* 5:135). It is also concomitant with the publication of *Three Guineas*, in June 1938, and with Woolf's autobiographical notes *A Sketch of the Past* (April 1939 to November 1940). Most notably, it was written in part during the war and, from summer 1940, under German bombing, both in London and in Monk's house, the Woolfs' country house in Sussex.

The story takes place from one evening to the next in June 1939, in a fictional countryside mansion, Pointz Hall, where a pageant is to take place. The readers are shown the private life of the owners, the Oliver family; the pageant's staging by the villagers, guided by the lesbian playwright Miss La Trobe; and the conversations and events that take place in the intervals. As David McWhirter wrote, the novel situates the readers both as such and as spectators, reproducing that "theatre of the brain" which substituted the actual Elizabethan theatre described in "Anon" (1993, 792). Moreover, although always only hinted at, the upcoming war looms over the whole pastoral setting: this is

considered Woolf's most overtly political novel, although, notably, with quite different opinions on the nature of its message.¹¹

The issue of fact and fiction is central to the novel: Woolf plays around the relations between the two in different media, emphasising how both can be found in, or generated by, all kinds of discursive situations. In particular, the quantic complementarity of the two ontologies plays a preponderant part in the characters' actions and in their identity's (self-)construction. Although they can only consider one side of the question at a time, the passage from the mindset of fiction to that of fact is obtained by way of interruptions. These force the characters – and the readers with them – to reorganise past information, like a wave function has to be recalculated (with new probabilities and new uncertainties) after a collapse. As Janet Joplin wrote: “For the first time in Woolf's career, . . . she elevates the interrupted structure to a positive formal and metaphysical principle” (1989, 89). Fiction, on the other hand, can interrupt factual judgement by ways of specific mental preparations that resemble those of a physical apparatus.

In *Between the Acts*, then, fiction is often generated by unexpected discourses. First, by historical narration: Lucy's Swithin, sister of Bartholomew, the family head, is led to fantastically imagine the land's prehistorical past by reading her “Outline of History.” When Grace, a servant, enters the room, Lucy has difficulty in separating her “from the leather-covered grunting monster who was about . . .

¹¹ Commentaries on Woolf's political message in the novel range from an unfaltering pacifism already expressed in *Three Guineas*, to a newly born but always critical patriotism, to a pastoral and somewhat feudal conservatism. A few examples. To Karen Schneider, in the novel, “Woolf attempts to reconcile a newly awakened attachment to her cultural roots – patriarchal and tyrannical as they are – with profound political convictions of which she is during the war even more conscious and committed to uphold” (1989, 100); Alice Wood argues that Woolf's “feminist-pacifist vision” is central to the novel and that “her anti-patriotism remains dominant” (2013, 106); readings such as Jane Marcus's (1987) especially emphasise the feminist and socialist polemics. On the other hand, Marina MacKay sustains that Woolf took cognition of the menace of total war too late, so that it is “impossible to superimpose the pacifist polemics of *Three Guineas* on her last novel” (2007, 30), and ultimately sees a form pastoral conservatism looming over *Between the Acts*; and while Steve Ellis refuses any positive form of community generated in the pageant, to argue that “La Trobe is precisely not offering a new world but the old patriarchal one” (2015, 217) and that the only positive mindset for Woolf can be found in the individual reflection over the novel's private reading, many others (see *infra*) have instead connected La Trobe's work to Brecht's, though with various degrees of correspondence.

to demolish a whole tree in the green steaming undergrowth of the primaeval forest” (BA 8). Secondly, fiction can derive from news reports: Isabella, wife of Bartholomew’s son Giles, takes up the newspaper to quench her thirst for reading:

For her generation the newspaper was a book; . . . she took it and read: “A horse with a green tail...” which was fantastic. Next, “The guard at Whitehall...” which was romantic and then, building word upon word, she read: “The troopers told her the horse had a green tail; but she found it was just an ordinary horse. And they dragged her up to the barrack room where she was thrown upon a bed. Then one of the troopers removed part of her clothing, and she screamed and hit him about the face...”

That was real; so real that on the mahogany door panels she saw the Arch in Whitehall; through the Arch the barrack room; in the barrack room the bed, and on the bed the girl was screaming and hitting him about the face, when the door (for in fact it was a door) opened and in came Mrs. Swithin carrying a hammer. (15)

Here, the newspaper report causes Isa’s recentering into Whitehall’s barracks. The story, evaluated as truth in the actual world yet lived as a novel (what Isa is looking at is *in fact* a door), is suddenly interrupted by Lucy, entering with a hammer in hand. A few moments later, the story comes back to Isa’s mind, superposing onto Lucy and Bart’s usual bickering: “Every year they said, would it be wet or fine . . . The same chime followed the same chime, only this year beneath the chime she heard: ‘The girl screamed and hit him about the face with a hammer’” (16). Lucy’s interruption, thus, stops an (already highly fictionalised) experience of actual facts and adds to it fictional particulars, revealing Isabella’s thoughts regarding the army’s inherent patriarchal violence. At the same time, British contemporary readers would have recognised the event as a true story occurred not in June 1939, but in April 1938 (see Clarke 1990) transposed into *Between the Acts*’ storyworld: they would thus have been forced to fictionalise the fact, and see for themselves whether one experience is different from the other.¹²

¹² For this episode, see also Beer (1996b, 136-39). In particular Beer asks: “Is the newspaper different from a book? Is one more real? How does fiction relate to know events? Woolf implicitly places these questions within her own

Thirdly, fiction in *Between the Acts* can involve visual art. Being relative newcomers, the Olivers are eager to construct their own family narrative, adopting a lady's painting hung upon the main staircase as an "ancestress of sorts" (7), collecting various paraphernalia, and relating anecdotes to their guests. Two pictures hung in the dining room make for a prop of the last task. The first represents an ancestor and his horse, inevitably sparking the story of how he failed to have his dog included in the painting and then buried with him. The second one is an unknown lady, looked at as pure aesthetic fact: "He was a talk producer, that ancestor. But the lady was a picture" (24). When the two first guests, Mrs. Manresa and William Dodge, arrive, the conversation inevitably shifts to the pictures: Dodge's interest for the unnamed lady provides a first interruption, sparing him from relating his own life (29). As Edward Barnaby wrote, while the Olivers try to "pageantiz[e]" their own life and house, "the female figure [in the painting] resists incorporation within the dynastic narrative and paralyzes the conversation" (2018, 87). That is not the case, however, for the ancestor's painting, which Bart uses to repeat the usual script. Contrary to the expected acceptance, however, Manresa provides the next switch from fiction to fact:

'But what about the horse?' said Mrs. Manresa.

'The horse,' said Bartholomew, putting on his glasses. He looked at the horse. The hindquarters were not satisfactory. (BA 31-32)

The interruption forces Bart to literally *refocus* (through a pair of spectacles) from his narration to the purely formal quality of the painting, thus from continuous fiction to isolated fact (remember the star-system in the Baedeker guides in "Craftmanship"). Once the anatomy of the horse proves disappointing, the family narration itself starts to show its artificiality.

fiction" (138). I would say that the answer is to be looked for in the reader's response to both fiction and its factual counterpart.

The pageant, an unflinching parody of England's history and literature by episodes, provides the best samples for such fact-fiction clashes. The readers are shown La Trobe's attempts to make her audience "see," and follow the events' reception now from the audience's point of view – through various kinds of free indirect discourse¹³ – now from her own. In any case, the entire play (with the partial exception of the finale) can be read as an effort by La Trobe to set what I would call the audience's *mental apparatus* to a fictional ontology that would unify and control their perspectives. However, constant interruptions undermine the enterprise:¹⁴ the wind blows away the chorus' words (49); the hidden gramophone stutters (47), or the records get mixed up (112); people arrive when the play has already started (50), laugh over the actors' voices (53), comment loudly and get shushed (98); the actors forget their lines (48), talk over each other (56), or their speech is muffled by their costumes (57); and between every act there is a pause, signalled by the gramophone's lamentation: "*Dispersed are we*" (59).

The audience members' response, as we have seen in "Anon," is based on their recentering into the fictional world: when the latter obtains, they effectively unify into a single and continuous mindset, accepting not only the events as inherently linked, but also the symbolical universality of certain characters. Yet, every interruption brings dispersion and singularity. In the unsuccessful beginning, for example, the audience's separation is at its highest: "[The child actress Phyllis'] words peppered the audience as with a shower of hard little stones. Mrs. Manresa in the very centre smiled; but she felt as if her skin cracked when she smiled. There was a vast vacancy between her, the singing villagers and the piping child" (49). Here, the metaphorical "shower of atoms" used by Woolf in "Modern Novels" (1919) to describe separate sensations falling on the mind's surface (see ch. 1.3, 76) is turned into little stones, recalling the solidity of dull facts. Completely estranged, the audience

¹³ David Herman (1993) distinguishes eleven types of discourse in *Between the Acts*, forcing different degrees of focus over the pragmatic context of the utterance. Woolf therefore tries to make the reader focus on how a certain message is passed, which in our case also means highlighting the contextual conditions of fiction-talking and fiction-thinking.

¹⁴ I signal one example per type, though the same kind of interruption happens usually more than once.

receives what can only be read at the moment as people reciting (badly): discontinuity means that fiction cannot be established. The response is hence singular (we only know Manresa's thoughts) and alienated. As soon as the gramophone starts, however, the audience's reactions, now collective, are related impersonally: "Miss La Trobe watched from behind the tree. Muscles loosened; ice cracked" (49).¹⁵ Manresa, who, as we will see, actively pursues her own fictional agenda, is now "afloat on the stream of the melody," producing an interference that confers her a key role even from the seats: "Radiating royalty . . . the wild child [Manresa] was the Queen of the festival. The play had begun" (49).

On the whole, the pageant is a catalogue of possible relations between factual and fictional mindsets. Although fictional content becomes increasingly preponderant – so that, by the Victorian playlet, the text almost takes the form of a proper script – the jerky relocations collapsing the fiction insistingly show the passages from one viewpoint to the other. They expose the continuous recalculations that the audience's members (and the readers, provided they are attuned to the free indirect discourse's refocalisations) are forced to undertake. The narrator shows this process by changing the description of the characters' clothes and actions (described either as genuine, or as costumes and gestures) and, especially, by naming them now with their proper names, now with their character's names. A poignant example is the presentation of the Elizabethan era, impersonated by the village's tobacco-seller. Here, the syntax emphasises the jolts from fictionality to factuality and vice versa, thus representing the tentative setting-up of fictional recentering. I italicise the fictional content:

Everyone was clapping and laughing. *From behind the bushes issued Queen Elizabeth* – Eliza Clark, licensed to sell tobacco. Could she be Mrs. Clark of the village shop? She was splendidly made up. *Her head,*

¹⁵ Louise Westling has already noticed how this double appearance of unity and dispersity in the characters seems to reconnect to the possible states of subatomic entities, now particles and now waves, depending on the state of observation (1999, 868). However, she soon turns to ecology, emphasising the connectedness over the dispersion. To me, both seem to be important for self-construction and experience in the novel.

pearl-hung, rose from a vast ruff. Shiny satins draped her. Sixpenny brooches glared like cats' eyes and tigers' eyes; pearls looked down; her cape was made of cloth of silver – in fact swabs used to scour saucepans. She looked the age in person. (52; my emphasis)

By the time “Great Eliza” begins to talk, “[t]he breeze had risen,” and the reader is free to imagine it as flowing around “perhaps a rock in the ocean” or around the “soap box” on which she has mounted (52). This is but one surface sample of a wealth of fact-fiction intersections. The pageant also includes the classic play within the play (55-57), where different fictional levels (the actors playing a piece, Elizabeth supervising, the pilgrims’ chorus chanting in the background) interfere, impairing the audience’s understanding, only to end with the secondary alternative storyworld swallowing the first in an all-encompassing dance (57).¹⁶ Later on, the audience is asked to self-imagine an entire scene from the Restoration playlet (85), thus living it through their “theatre of the brain”; or is made to participate, living the fiction in the first person.¹⁷ At other times, with the fiction about to crumble, the audience’s expectations end up fictionalising random natural events. Once, with the chorus’ words almost completely lost in the wind, the bellowing cows “annihilated the gap; bridged the distance; filled the emptiness and continued the emotion” (85); notice, once again, the opposition between fictional continuity and factual discontinuity. Alternatively, fiction ends up becoming factual, as when read through the confusing and disconnected pageant programme (55).¹⁸ In all these cases, not only

¹⁶ “The gramophone blared. Dukes, priests, shepherds, pilgrims, and serving men took hands and danced. The idiot scampered in and out. Hands joined, heads knocking, they danced round the majestic figure of the Elizabethan age personified by Mrs. Clark, licensed to sell tobacco, on her soap box” (BA 57).

¹⁷ When Budge, the publican, playing a Victorian bobby and more symbolically the whole oppressive system of Victorian societal control, points his truncheon at Lucy, she “raised her skinny hand as if in truth she had fluttered off the pavement on the impulse of the moment to the just rage of authority” (BA 96-97).

¹⁸ “‘What does the programme say?’ Mrs. Herbert Winthrop asked, raising her lorgnette.

She mumbled through the blurred carbon sheet. Yes; it was a scene from a play.

‘About a false Duke; and a Princess disguised as a boy; then the long lost heir turns out to be the beggar, because of a mole on his cheek; and Carinthia – that’s the Duke’s daughter, only she’s been lost in a cave – falls in love with Ferdinando who had been put into a basket as a baby by an aged crone. And they marry. That’s I think what happens,’ she said, looking up from the programme” (BA 54-55).

the point of view, but also what we could call the intentionality of the audience's observation determines the ontological positioning of the observed objects and events. The narration of the pageant thus requires the readers to conduct an experiment in refocalisation, asking them to repeatedly readapt their mental apparatuses, and to notice the differences brought by each switch in configuration. In both its material conditions and in its ontological features, La Trobe's theatre acts as a quantum image that can produce inferences about its own fictional world. To these inferences I turn.

Complementarity and Reception

As anticipated, we can understand the reader's position with respect to the text as double. Normally, the reader's recentering into a fictional world is as generic "passive spectator" (Marie-Laure Ryan 1991, 72) within the storyworld. However, the pageant's specific context-of-utterance, centred on a lively group experience, drives the readers to relocate within its semiactive audience and participate in the enactment of the fact-fiction discrimination. The continuous jerks between the two ontological positions in the pageant, I would argue, make the readers hypersensitive to such shifts in the novel in general even when not explicitly called for. This induced heightened reception works both retrospectively for the events before the pageant (the quoted scenes related to history, newspapers, and visual art) and for whatever goes on between and after the acts. Primarily, it affects the readers' perception of the characters' identities, as it emphasises the role of linear personal narratives on the one hand, and disconnected happenings on the other, in identity construction, as a kind of double ontology. At a micro-textual level, this process is mainly signalled by periphrases identifying the novel's characters, which tend to acquire the status of fictional selfhoods, bearing the same distinction as that between pageant's characters and corresponding actors. Consider Lubomir Doležel's analysis of proper names and definite descriptions for characters, constructing a "two-value

intensional structure” in a novel (1998, 139).¹⁹ While the first case, say “Isabella,” has zero intension (it is a purely extensional referent), the other – e.g., “Mrs. Giles Oliver” (*BA* 11) – has an added intensional meaning that depends on its frequency and the descriptions’ (ir)regularity. To Doležel, extension and intension are complementary (in the common sense) for meaning-construction within a storyworld. However, the dynamics of *Between the Acts* pushes the readers to emphasise the element of fictionalisation of *all* descriptors, relocating them in alternative storyworlds in the characters minds.²⁰ Additionally, the narration presents a recurrency of metaphors which relate clothes (as in costumes) to both social roles and a deeper sense of selfhood.²¹

Such fictionalisation of the characters’ identities proves to be foundational to their (temporary) stability, in both positive and negative sense. On the one hand, the readers are made to see the colonialist, patriarchal, and warmongering aspects of certain characters’ fictions; on the other, they have to recognise that no identity can be sustained without a fiction to consolidate it. To use Woolf’s own words, the “truth of fiction” is indispensable to sustain the “truth of fact,” or better yet to organise the latter into a coherence (a linear process, if not a teleology) that can nonetheless be broken at any new happening. In this sense, self-constructive fictions bear in Woolf a similar value to Valéry’s implexe, accounting for the personal potential felt by each character. They also give a sense of causal

¹⁹ For Doležel’s concept of intension, see also Introduction, 29.

²⁰ Note, by the way, that the same process of fictionalisation is openly shown at the level of the alternative storyworlds of the pageant. In the playlet dedicated to Restoration, the characters are overemphatically presented as deceiving themselves by choosing names that seem to come from escapist literature, in order to forget their condition of *nouveau riches* and portray themselves as nobility: “*Asphodilla I call myself, but my Christian name’s plain Sue*” (*BA* 79).

²¹ For example, Dodge sees Isabella as changing her dress into a “strait waistcoat” as soon as Giles arrives and she takes on her role as wife (*BA* 65); Giles himself is cautiously dressed for whatever occasion arises, whether for guests (30) or even just for the after-dinner with the family (127); more generally, the audience feels “clothes conscious” (90) in the moment of passage between two playlets; and the actors themselves, after the play is finished, “still acted the unacted part conferred on them by their clothes” (116). Most importantly, and again signalling the blending between physics and neurology, flesh itself seems to become the clothing of an inner self, once a fictional identity is reconfigured: Isa’s sudden realisation of her husband’s infidelity destroys the romantic ideal that she had constructed around herself and a farmer whom she had seen but a few times: “The flesh poured over her, the hot, nerve wired, now lit up, now dark as the grave physical body” (123).

connection to the characters' apparently incoherent actions, as means of sustaining (or recalibrating through interruption) certain identity patterns. In short, they constitute a "theatre of the brain" that is available to the readers alone, as spectators of stories taking place within an ontological system differentiated from, yet similar to, that of the pageant. Various are the possible examples: Giles heroic and meaningless slaying of a snake choking on a toad (61), which impinges on the fictional characterisation as a "surly hero" imposed on him by Manresa (58 and *passim*); Isa's romantic fantasy over a barely known gentleman farmer, sustained by her continuous attempts at poetry (6), as well as her forced love to Giles as the "father of my children . . . slipping into the cliché conveniently provided by fiction" (11); Dodge's own falling for Giles (through the homosexual counterpart of the surly hero's appreciation); and his moment of adoration for Lucy Swithin, seen as a sort of Goddess who could deliver him from his pain (45-46), which seems to derive from his enthrallment in her theistic worldview;²² and Bart's constant daydreaming of his colonial past, driving him to enact a cruel joke at the expenses of Isa's little son (10). As seen before, here too events/interruptions have the same destabilising power as in the pageant: facts destroy and force a recalibration of fiction, yet until then the latter is made to flow continuously in the characters' mental background.

The cases of Lucy Swithin and Mrs. Manresa are particularly telling, due to the pertinacity of their fictional games. Lucy's narrative is inherently religious and all-encompassing: her world is a flowing symphony of elements seen by an omniscient perspective. To her slightly malignant acquaintances, her imagination is "one-making. Sheep, cows, grass, trees, ourselves – all are one. If discordant, producing harmony – if not to us, to a gigantic ear attached to a gigantic head" (104). Her fictionalisation of reality is connected to a state of passivity, an acceptance of the world's incomprehensibility in the face of God's deeper truth. To her brother Bart – who constantly prizes

²² And in fact, as soon as the cross around Lucy's neck flashes in the sun, the magic is broken, the suspension of disbelief interrupted, and William's hope shattered by the cognition of the oppressive system sustaining her almost ethereal and playful identity: "As he looked at [the cross], they were truants no more" (BA 46).

himself of being attuned with facts,²³ she “would have been . . . a very clever woman, had she fixed her gaze” (17), yet “[u]p in the clouds, like an air-ball, her mind touched ground now and then with a shock of surprise” (71). While the insistence on perspective and observation (fixing one’s gaze) hints at the necessity of directly meddling with facts to acknowledge them (and collapse the fiction), the idea of the mind’s flights recall, though in a much weaker form, the kind of escapism from reality that we have previously encountered in Valéry’s *Faust*. Note, however, that such passivity is not a natural state of mind: “Faith required hours of kneeling in the early morning” (121).

On an opposite yet parallel direction, Manresa’s fictional identity as a “wild child of nature,” alluring and unconcerned with social constraints and sexual taboos in spite of her actual wealth and advancing age, is maintained through a most active recalibration of facts. Far from keeping an unfocused gaze, her “ogl[ing]” includes people in her own narrative. She “restore[s] to old Bartholomew his spice islands, his youth,” “confer[s] youth upon” Isabella (27), and, as quoted, turns Giles into her “surly hero” (58) by hacking the narrative provided by La Trobe. While Lucy takes her religious and unified world to be the real one, Manresa is conscious of the fictional game’s importance to distinguish herself from the rest. In her eyes, women in general are conspirators that could see through her. Especially, “it was the women of her own class that bored her” (65), being mirrors revealing her own real condition. For the same reason, any talk of metafiction must be promptly discouraged:

“Imagine?” said Mrs. Swithin. “How right! Actors show us too much. The Chinese, you know, put a dagger on the table and that’s a battle. And so Racine...”

“Yes, they bore one stiff,” Mrs. Manresa interrupted, scenting culture, resenting the snub to the jolly human heart. (85)

²³ The already quoted fixation with his colonial youth, nonetheless, provides a counterpoint to such attitude.

The possible relations between identity, unification and dispersion, and fact and fiction, are recalled and ordered in a coherent process by La Trobe's last act: "Present time. Ourselves" (105). Its various parts each enact a different balance between the elements: first, pure factuality: ten minutes of "present time," i.e. only the sounds of nature without nothing happening on stage. La Trobe's "experiment" soon proves too extreme, causing the audience's fragmentation, as well as her dismay: "This is death, death, death . . . when illusion fails" (107). The audience's spasmodic expectation for some, *any* kind of fiction that would cease their condition of identitarian suspension "without being, in limbo" (106) turns a sudden rain shower into a universal symbolic event, "like all the people in the world weeping" (107). From that point, the recalibrated state is one of pure fictionality and unification: the music starts again, with a nursery rhyme followed by a waltz, and the audience witnesses the fictional rebuilding of a wall representing "Civilization" (108). The "flattering tribute to ourselves" reproduces the positivistic narrative, helped by newspapers' propaganda, which drove British politics through the very beginning of the war, repeating "what the *Times* and *Telegraph* both said in their leaders that very morning" (108).

This is soon interrupted by a round of jazz music, breaking the flow with its staccato rhythm. The audience relates it to the younger generation which can only "smash to atoms what was whole" (109). The actors reappear pointing mirrors at the spectators, showing bits and parts of their bodies: the disconnected factuality of their sudden appearance "before we've had time to assume..." (109) their fictionalised identities. Here, separation and unification, fact and fiction, are shown in clash. As Jane de Gay argued, jazz and mirrors produce "new ways of coming together" and a "new aesthetic . . . which stresses the necessity to accommodate discordant elements without reducing them to harmony" (2006, 200-1). The actors further emphasise this non-harmonic collective by reciting various disconnected lines over each other. Although the narrator defines them as "some phrase or fragment from their parts" (110), many quotations seem to link various literary works with the personal narratives of single members of the audience, including them directly in the never-ending

fictional renegotiation.²⁴ Such exposure to fictional instability and factual disconnectedness shocks the audience: notably, the only exception is Manresa who, cognisant of the fictional game, looked at herself in the mirrors, “powdered her nose; and moved one curl . . . to its place,” leaving Bartholomew amazed at the fact that “[a]lone she preserved unashamed *her identity*” (110; my emphasis). The jazz tune is then interrupted by La Trobe with a megaphone, questioning what can be born from such “*orts, scraps and fragments like ourselves*” (111): the answer arrives in the form of an unrecognised tune, either classical or traditional, which drives the entire audience into unity: this time, a superposition obtained through different vibrations, each contributing to the total with its individual tune (remember Eddington and Thomson’s explanations of superposition through music):

Like quicksilver sliding, filings magnetized, the distracted united. The tune began; the first note meant a second; the second a third. Then down beneath a force was born in opposition; then another. On different levels they diverged. On different levels ourselves went forward; flower gathering some on the surface; others descending to wrestle with the meaning; but all comprehending; all enlisted. The whole population of the mind’s immeasurable profundity came flocking; from the unprotected, the unskinned; and dawn rose; and azure; from chaos and cacophony measure; but not the melody of surface sound alone controlled it; but also the warring battle-plumed warriors straining asunder: To part? No. Compelled from the ends of the horizon; recalled from the edge of appalling crevasses; they crashed; solved; united. And some relaxed their fingers; and others uncrossed their legs.

Was that voice ourselves? Scraps, orts and fragments, are we, also, that? The voice died away. (112)

²⁴ Thus, “*I am not . . . in my perfect mind*” (BA 110; from *King Lear*) was actually said by Giles before over one of the play’s tunes (53), and so is the later “*The owl hoots and the ivy mocks . . .*” (110); “*I’m the old top hat*” (110), which Gillian Beer recognises as a music hall song, (142, n. 116) could easily be connected to Manresa; “*and maiden faith is rudely strumpeted*” (110, from Shakespeare’s *Sonnet* 66) seems connected to Isabella’s reading of the young girl’s rape, and is in tune with the suicidal motive of most of her poetry; seemingly, “*Is that a dagger that I see before me?*” (110; from *Macbeth*) recalls Lucy’s explanation on “the Chinese” who “put a dagger on the table and that’s a battle” (85), or can also be connected with the little scene played by Isabella at the greenhouse with William – ““Plunge blade!’ she said. And struck” (69) – which she only pretends to be from the play; and “*In thy will is our peace*” (110; translation of Dante’s *Paradise*, canto 3), i.e., Piccarda Donati’s description of the unity of the blessed in Paradise, seems perfectly in tune with Lucy Swithin’s life philosophy.

Michele Pridmore-Brown has already related this and other passages to Schrödinger's wave function and its superposed possibilities. She connected single identities to particles, the sense of unity (usually obtained through surrender to ideologies) to waves, and the final state just quoted to a sort of "synthesis" where "each individual is both actor-participant (connected) and observer (discrete, separated) in the human drama" (1998, 419). Her reading is integrated with later information theory, drawing on an artistically positive sense assigned to the concept of "noise" as a means of free, unconditioned interpretation. However, in light of Woolf's contemporary explanations of physics, and of what I have said up to now, the superposition enacted at the end of the play inevitably requires a sum of wavelike components, thus (in the logic we followed) of fictional elements – continuous identities – that pertain to a different ontology. Such components can unify into new configurations which, in turn, will influence the probabilities in the "realm" of factuality, of (apparently) disconnected bodies, events and actions. Identities and ideological narrations lie on the same plane, and this allows for the interruption and reconfigurations of both. Nonetheless, in line with Pridmore-Brown interpretation, what La Trobe presents in the various sections of her finale is indeed a sequence of possible states culminating in one which positively reconfigures the notion of community, rejecting ideologically simplistic and totalitarian narrations. Following her example, we now look into the politics of fact, fiction and art which results not only from the pageant, but from the novel in general.

Complementarity, Superposition, and the Role of Art

We have seen that, in *Between the Acts*, semantic value is established within the double ontological plane of fact and fiction, to be looked at through the lens of complementarity and with the help of fictional worlds theory. The pageant's audience observes either characters or actors, and sets them up in their right "world" within the "theatre of the brain," interpreting their words and actions now as fact, now as fiction. Similarly, readers start from the string of words on the page and

have to shift their meaning in accordance with their ontological positioning. The narration's linearity is frustrated by the ontological fractures implemented via the variables of free indirect discourse and, more generally, of micro-textual intension. Whether we are immersing in the fiction, or in the fiction within the fiction, or just skimming through the surface of the narrator's alliterative and rhyming wordplays, or even made to reconsider the events through the actual world – as in the case of Isa's newspaper – we are constantly reminded of such repositioning.

I would argue that here lies the text's main political argument: the constant shifting and interruption draw attention to the role of the mental apparatus in the appraisal of reality, i.e., to what conditions a person's ontological stance and reorients their world-semantics. As Ben Harker wrote, La Trobe's parodic and dysfunctional pageant “brings into partial view culture's repressed material origins” (2011, 445), refusing any innocent notion of cultural tradition. We can now add that *Between the Acts* equally displays matter's repressed cultural origins, since facts themselves are shown to deploy from a system of interacting fictions. Readers are made to recognise both the indispensable role of fiction (in the Woolfian sense) within factual analysis and (singular or group) identity formation, and their own capacity to reformulate it by interruption, by using (or being) a point of discontinuity in a linear narrative that refuses, corrects, or transforms it.

This active resemantisation updates *Three Guineas*' non-interventional policy. As argued by Jane de Gay, the pamphlet was divided between the urgency of facts (such as the Spanish civil war and Europe's militaristic crescendo), which made literature an inadequate response, and an opposite “strong desire to turn to literature for answers” (2006, 186). Eventually, Woolf urged women, as outsiders in society, to maintain total “indifference” towards any patriotic or warmongering attitude, since “in fact, as a woman, I have no country. As a woman I want no country. As a woman my country is the whole world” (3G 185). Yet, with the approaching and then constant presence of war at home, and the end of English culture now being a concrete possibility, indifference could not be enough. Not that sustaining either war or the empire's patriotic agenda was a feasible alternative. Instead, in the moment of crisis, literature could show how to turn the hegemonic discourse into a different

direction, imperceptibly yet effectively, by way of interruption. The answer to Bart, dreaming of his colonial youth and of a gun in his hand on the verge of total war, is thus Isabella's sudden entrance in search for something to read: "'Am I,' Isa apologized, 'interrupting?'" (BA 13). Helen Southworth has noticed how such discursive ruptures are taken up mainly by female characters (Isa and Lucy in particular) and connected to the novel's actual spaces, especially by having a woman enter a room: "Rather than positing two separate spaces, permitting distinctions such as inside/outside, yes/no to persist, Woolf focuses on intersections. These spaces are fraught with possibility" (2007, 49). Drawing on this, and on Woolf's particular kind of mixture of empiricism and idealism seen in the previous sections, we can define such intersections as inter-ontologies, impinging on the inevitability of mental interpretation in the observation of the world. Such extension allows to include not only female interruptions, but also those of nature and chance. Accepting to turn our eye to them, seeing the effect they have on *any* narrative, is the antidote that Woolf finds to both hegemonic discourse and identity stagnation. It shows the simplicity and naturalness of self- and world-recalibration: the observer's role in the wave-function collapse.

La Trobe doubly incarnates this new policy. On the one hand, her work proposes an alternative history of England and a different idea of community in the finale – itself linked to the mutual implications of fact and fiction. While being an outcast *à la Three Guineas*, she decides to take the field to pass a specific message to her fellow countrypeople. On the other hand, her failure to construct a completely endearing narrative due to external disturbances forefronts the role of the apparatus, showing that fiction needs a specific pragmatic setting and the audience's attention/collaboration to function properly. The audience's alienation from the play led many critics to interpret La Trobe in light of Bertolt Brecht's theatre and its connections with Walter Benjamin's philosophy.²⁵ The main

²⁵ As some examples (others will come in the text), Catherine Wiley sees La Trobe's failure as Woolf's success as a Brechtian, arguing that "a few years before Brecht published his strategy for creating political theatre, Virginia Woolf vicariously staged an epic theatre piece" (1995, 7); Georgia Johnston (1997), focusing on Mrs. Manresa's active theatrical role, considers her as an Aristotelian dramaturgist, reinforcing the existing class system, opposed to La Trobe's Brechtian and disruptive scope; in a less black-and-white definition, recognising La Trobe's impellent and traditional impulse to

problem with such readings is the negative role inevitably assigned to fiction, whereas, as I have discussed, the latter seems to remain critical for Woolf. In line with Michael Tratner (2000, esp. 124-26), I would argue that the alienation effect produced by Woolf's text does not undermine the role of art in society, not only because "Woolf seeks in the arts a form in which multiple voices can speak simultaneously" (126), but also because art itself (or rather, the kind of fictional immersion it can produce) is fundamental in shaping the actual world (*in spite* of its possible role in sustaining hegemonic narratives). Interestingly, among what has been noted as undoubtedly common in Woolf, Brecht, and Benjamin we find the idea of the "performativity" of truth, i.e., the creative role assigned to the observer in the definition of phenomena, that Brecht took from quantum mechanics (see Mairhofer 2021); and the connection between Woolfian community (at the end of La Trobe's play) and Benjamin's concept of "constellation" as totality made of independent components, which Karen Jacobs links, starting from Pridmore-Brown's quoted analysis, to the new kinds of relations introduced by contemporary physics (2001, 218 and n. 13). We see here how close the questions brought up by Woolf, Brecht, Benjamin, and quantum physics regarding the negotiation of truth were. In Woolf in particular, the role of fiction, although problematic when monopolised by certain social actors, is inextricable, yet ontologically separated, from facts, as the wave-function is inextricable yet ontologically separated from the actual states of the particles. La Trobe manages, in spite of her failure, to express this situation, as proven by the afterthoughts of some audience's members: "The looking-glasses now – did they mean the reflection is the dream; and the tune . . . is the truth? Or was it t'other way about?" (*BA* 118-19). As readers, the answer depends on how we set our mental apparatuses.

This calls back to the role of art in society. La Trobe's work fails to convey a clear message, yet allows to infer from it a particular interpretative stance. Her finale evokes an experience connected to a superposition of the spectators' interpretations. These are then presented in scattered form once

make the audience "see" as pure spectators while educating them, Edward Barnaby prefers to mark her as a "frustrated Brechtian dramaturge" (2018, 92). See also in this chapter, 278, n. 11 for opposing readings.

the play is finished: while everyone is going back to their cars, the narrator reports their voices within the same quotation marks, uniting many conflicting understandings in the same mimetic space. The play itself, its words and the images it conveyed, is shown in the process of becoming many plays, one for each villager. Or even more: when, later, Isabella is asked whether she agrees with Reverend Streatfield's interpretation:

‘Yes,’ Isa answered. ‘No,’ she added. It was Yes, No. Yes, yes, yes, the tide rushed out embracing. No, no no, it contracted. The old boot appeared on the shingle.

‘Orts, scraps and fragments,’ she quoted what she remembered of the vanishing play. (127)

Meaning comes and goes in waves, leaving detached fragments of facts. Which brings the question: was the meaning ever *one* meaning? Although the example here is macrotextual in kind (the entire play is being recapitulated), Woolf considered single words and phrases in the same fashion. In “Craftmanship,” she states that the nature of words is “not to express one simple statement but a thousand possibilities” (*E* 6:92). Their power, she continues, is not utility, but truth, and a truth dependent on their immense longevity: “Buildings fall . . . But words, if properly used, seem able to live for ever” (93). Such proper use is not semantic precision, but the appreciation of all the possible meanings and combinations, once again expressed in a wavelike form:

Thus one sentence of the simplest kind rouses the imagination, the memory, the eye and the ear . . . The moment we single out and emphasise the suggestions . . . they become unreal; and we, too, become unreal . . . In reading we have to allow the sunken meanings to remain sunken, suggested, not stated; lapsing and flowing into each other like reeds on the bed of a river. (94)

Quoting this passage and loosely connecting sunken and surface meaning with Gottlieb Frege's *Sinn* and *Bedeutung* (i.e., sense and denotation), Jocelyn Rodal reads Woolf's symbols as mathematical variables. In her sense, symbols in Woolf “have relatively singular senses, but remarkably multiple referents” (2018, 86), retaining an arbitrary character, shunning cultural

associations, and discouraging metonymic connections. While this concept can be wonderfully applied to certain Woolfian symbols (e.g., to Jacob in *Jacob's Room*) I would suggest that the quoted passage is more clearly linkable to that *particular* variable represented by the wave function, expressing the evolution and amplitude of semantic possibilities for each word in a system, not only because Woolf is attentive to linguistic history,²⁶ but also because such possibilities are not all equally probable.²⁷ Here, therefore, Woolf is advocating a kind of semantic superposition, where the possibilities are all maintained, and collapse onto single sense is avoided. What in Valéry's *Mon Faust* was a virtual space of actual or fictional possibilities is here a virtual space of possible meanings.

Yet, when applied to a fictional world, semantics turns into ontology. Woolf had been thinking about this in the context of the relations between play and novel. On the 17th of April 1934, she noted on her diary:

An Idea about Sh[akespea]re

That the play demands coming to the surface – hence insists upon a reality wh. the novel need not have, but perhaps should have. Contact with the surface. Coming to the top. This is working out my theory of the different levels in writing, & how to combine them: for I begin to think the combination necessary. This particular relation with the surface is imposed on the dramatist of necessity: how far did it influence Shre?

²⁶ A bit later, in "Craftmanship": "Words, English words, are full of echoes, of memories, of associations – naturally. They have been out and about, on people lips, in their houses, in the streets, in the fields for so many centuries" (*E* 6:95). Cultural association is then a very important factor. Gadda shared the same historical perspective, although from a more macaronic stance. From "Come Lavoro" ("How I Work"): "Le parole nostre, pazienterete, ma le son parole di tutti, publicatissime: che popoli e dottrine ci rimandano. Sono un collutorio comune di che più o meno bravamente ci gargarizziamo, risputandone ognuno in bocca all'altro e finalmente tutti in un guazzo, come in quella scodella di noce di cocco del Salgari dove scaracchiavano a circolo i cresputi maggiorenti dei Cèp-Cèp con anelli d'oro in nel naso e cerebottana tra i ginocchi: e, poi, la porgevano bere al missionario, in segno d'onore" (*SGF* 1:436-37); ("You will excuse me if our words are but everyone's words, very much spreaded: that people and doctrines give back to us. They are a common mouthwash that we more or less brazenly gargle, spitting each of us in each other's mouth and finally all in a puddle, like Salgari's coconut-made bowl in which the crested big names of the Cèp-Cèp, with golden rings on the nose and a blowpipe between their knees, sputtered in a circle: and, then, gave to drink to the missionary, as a mark of honour.").

²⁷ "Words belong to each other, although, of course, only a great writer knows that the word 'incarnadine' belongs to 'multitudinous seas'" (*E* 6:95).

Idea that one c[oul]d work out a theory of fiction &c on these lines: how many different levels attempted, whether kept to or not. (*D* 4:207)

Woolf is here reflecting on intension and extension: all the semantic possibilities derivable from the signifier, including its syntactic and phonetic texture, superpose in a fluidity on the surface of which the signified manifests. In theatre, where words come from, and refer to, actual beings, the contact with the surface is inevitable. The novel, too, can obtain a similar effect, although within the theatre of the brain. But if the objective of interpretation is the avoidance of the textual wave-function's collapse, the continuous flow of sense cannot but multiply and superpose the "different levels" without achieving a definite sense.

Between the acts espouses such aesthetics, highlighting superposition both in mimesis and in diegesis. At the phonetic level, as Gillian Beer noticed (1996b, 131-36), the novel is an intricate net of connections: words call back to each other through alliterations, rhymes and puns even after many pages. This creates ever-renewed systems based on sound alone – often with a comic effect – while the characters are "rolling words, like sweets on their tongues" (9) or producing new rhymes for the sake of it. Thus, words acquire meaning by phonetic relation. At the semantic level proper, the novel is probably Woolf's best effort at creating a complex intertextual net of meanings, both in the narrator's discourse and in the characters, who continuously quote bits and parts of poetry, scattered pieces proving the historical depth and the "out and about" character of English language. To quote Beer: "Individual authors and whole poems are lost in the oceanic flow of language" (135).²⁸ The fragmentary nature of the quotations, however, should not mislead the reader: Woolf's narrator asks us to keep the poems' *entirety* in mind, making them resurface in unexpected places. At the word/sentence's microlevel, quotations momentarily superpose alternative senses to the contextual one. At the novel's macrolevel, entire poems and stories (to be made to flow from the fragment,

²⁸ Or, to quote Jane de Gay, Woolf weaves "an almost Barthesian 'tissue of quotations' into her novel, as poetry is bound in with everyday conversation, newspaper reportage, superstition and nursery rhyme" (2006, 203).

running their unexpressed parts in the back of the mind) play a part in shaping the larger themes (always through multiple possible interpretations) and being shaped in turn by the narration. The clearest and most studied example is the ancient Greek legend of the sisters Procne and Philomela.²⁹ As demonstrated by Jane Marcus (1987), the story runs through the entire novel, appearing especially through Bart's quotations of Swinburne's *Itylus* (1866, *BA* 67 and 70-71), where the nightingale asks the swallow to remember the slain child. To Marcus, Woolf refuses such perspective and instead puts the rape to the forefront, but eventually shows the failure of feminist sorority in English society. This redefines the presence of actual swallows (and the absence of actual nightingales, see *BA* 5) in the novel. Yet, Swinburne is not the only voice superposed over the birds' value: Isa also quotes Keats' *Ode to a Nightingale*, where the bird is pictured as oblivious of human affairs (*BA* 35); Bart ends up twisting Swinburne's poem, identifying himself with the nightingale (70); and the legend itself has various contradictory versions. As Jane de Gay noted, "the example of 'Itylus' reveals that Woolf's allusions resist the stability of meaning necessary to build them into a plausible scheme" (2006, 205-6). Woolf is showing the intricacy of literary symbolism within the larger context of group culture.

Not only poems flow in the background: at times, it is the very history of language that needs to be recounted. Take the quoted scene of Giles walking alone during an interval, frustrated at his own inadequacy in the face of the coming conflict, until he finds a snake choking on a toad:

The snake was unable to swallow; the toad was unable to die. A spasm made the ribs contract; blood oozed. It was birth the wrong way round – a monstrous inversion. So, raising his foot, he stamped on them . . . Action relieved him. He strode to the Barn, with blood on his shoes. (*BA* 61)

Action, though senseless, provides an interruption to his felt ineptitude and reconfigures him as a monster slayer. The blood on his shoes, later noticed by Manresa, confirms her vision of him as a

²⁹ Married to the Thracian king Tereus, Procne feeds him their son Itylus after having discovered that he had raped Philomela and cut her tongue, thanks to an embroidery woven by Philomela. To help them flee from Tereus, the gods transform Procne into a swallow, and Philomela into a nightingale.

“surly hero” and eventually leads to their sexual intercourse in the greenhouse. More vaguely, in the background, we can glimpse a caricature of Saint George (England’s saint patron) slaying the dragon, which paints the scene in the overtones of English male patriotism and senseless violence. Yet, at an even deeper level, the snake’s “monstrous inversion” must remind the readers of William Dodge’s homosexuality. Not only does William think of himself as a “little snake in the grass” (46), but Giles also considers him a “toady; a lickspittle” (38). While “toady” generically means “flatterer,” its etymology brings back to a trick used by charlatans’ accomplices: eating a toad, allegedly venomous, to be saved by the charlatan’s fake remedy. This additional semantic level emphasises William’s struggle with detaching himself from Giles’ heroic fiction, paints Giles (and male wannabe war-heroes in general) as a quack, and shows the blood that inevitably results from the outsiders’ help to machoistic narratives. All associations are active at the same time.

Giles provides another sample of how far Woolf takes her multiple-level semantics. While watching the play, and right after muttering a line from *King Lear*, “[w]ords came to the surface – he remembered ‘a stricken deer in whose lean flank the world’s harsh scorn has struck its thorn . . .’” (*BA* 53). The image comes from Book V of William Cowper’s *The Task*, where the metaphorical “stricken deer that left the herd” ([1785] 2013, 114) looks at human society from afar. Cowper’s following lines harshly ridicule his contemporaries, defying, like *Between the Acts*, personal dreams of glory, masculine fictions, and all-encompassing narrations. The mockery includes those who “write a narrative of wars, and feats / Of heroes little known, and call the rant / A history” (115), but also the scientists calculating the age of the Earth or studying the universe’s secrets. Cowper’s poetic voice concludes sarcastically: “Is’t not a pity now, that tickling rheums / Should ever tease the lungs and blear the sight / Of oracles like these?” (116). Apart from the general resonance, the word “oracles” comes back at the end of the pageant among the audience’s scattered yet united voices: “Then those voices from the bushes ... Oracles? You’re referring to the Greeks? Were the oracles, if I’m not being irreverent, a foretaste of our own religion?” (*BA* 118). A few lines later, religion brings back to atomic physics: “It’s odd that science, so they tell me, is making things (so to speak) more spiritual ... The

very latest notion, so I'm told, is, nothing's solid ... There, you can get a glimpse of the church through the trees" (118). Thus, Woolf makes Cowper resurface from the semantic flow of meaning to belittle the scientific dream as oracular religion, i.e., a narrative based on a fictional teleology (indeed in the background of the analysed physical popularisations³⁰). Yet, she includes Cowper's own religious feeling in the critique.

The audience's discourse, moreover, is replete with other words and phrases coming from most classic lines, half quoted or used in completely different contexts, in the culmination of a trend active throughout the whole novel.³¹ Against readings such as Alex Zwerdling's, who sees these and others samples as the "cultural detritus" (1977, 231) of a dying culture, or Alice Wood's, for whom they reflect Woolf's "own anxieties about the aesthetic legitimacy of wartime literature" (2013, 129), I would emphasise the positive character of such literary dispersion. As Jed Esty argued, far from being a sign of cultural demise, these fragments show the return of that common voice which Woolf had recognised, in her last essay "Anon," as the first phase of English literature: "If 'Anon' provides a history of art's segregation from broad social power and meaning, *Between the Acts* imaginatively reverses that history" (2004, 103). Esty reads the text as a correction and evolution of the elitist side of modernism, a shift from the writing of consciousness to a greater attention to alternative forms of national identity, portraying a "spontaneous community which *is in itself* meaning and which

³⁰ In his conclusive chapter, for example, Eddington underlined the new spiritual character of physics and argued: "It will perhaps be said that the conclusion to be drawn from these arguments from modern science, is that religion first became possible for a reasonable scientific man about the year 1927. If we must consider that tiresome person, the consistently reasonable man, we may point out that not merely religion but most of the ordinary aspects of life first became possible for him in that year" ([1928] 1929). As stated before, Jeans was much more radical in his claims: "We discover that the universe shews evidence of a designing or controlling power that has something in common with our own individual minds – not, so far as we have discovered, emotion, morality, or aesthetic appreciation, but the tendency to think in the way which, for want of a better word, we describe as mathematical" (1937, 187).

³¹ Thus, *Hamlet*'s monologue comes to the fore as one former spectator quips: "He [Rev. Streatfield] said she meant we all act. Yes, but whose play? Ah, *that's the question!*" while another offers a lift "if you don't mind playing *bodkin?*" (BA 118; my emphasis); the "[d]ing dong" (118) of the church bells recall *The Tempest* (see 143-44, n. 122); another spectator interprets the sudden rain shower through Walt Whitman's *Tears* (144, n. 123).

therefore renders obsolete the modernist artist's gift of form" (2004, 106). However, in light of the deeper formal project that I hope to have shown at work, I would argue for a more essentialist take on art in the novel, one close to, yet more politically active than, Valéry's idea of harmonics. Valéry was looking to realise a state where images generated images *ad libitum*, in a purely aesthetic condition of no-return. Woolf asks art to maintain a similar semantic suspension, a continuous passage from one superposed level of meaning to another, as a foundation to its own aesthetic immortality *and* as a possibility for political value. On a diachronic plane, the non-collapsing virtuality of the artwork, its expressing "a thousand possibilities," is the only way for art to resist time and keep providing "truth" in the sense given in "Craftmanship." On a synchronic plane, such virtuality is collapsed in the infinite possible interpretations that can be drawn and rediscussed by the audience, and that soon become bits and parts of their (fictionally implemented) world-vision, leading to a multilateral and composite national identity (thus back to superposition). Semantic multiplicity, in this sense, is the condition allowing for semantic reconfiguration. It leaves the reader/audience with the means and the ability to choose, each time, "what we must remember; what we would forget" (*BA* 93) from a fictional system (again, in Woolf's enlarged sense) that allows for ever-increasing perspectives, as it grows with every new work and every new combination.

The process of semantic shattering and reconfiguration – collapse and recalculation – is deployed in the finale. Showing the Olivers alone in the house, the narration is torn between the annihilation of the past and the possibility of a new disposition. The reorganisation includes both facts and fictions, as "the morning paper . . . obliterated the day before"; "Isa . . . watched the pageant fade"; "the flowers [in the garden] flashed before they faded"; Isa tried to imagine the continuation of that morning's rape scene: "She had hit him... What then?"; while "[s]hadow had obliterated the garden" (128). Nightfall can call for imminent tragedy, but also for new possibility. As Woolf wrote in "Craftmanship," in a rather quantic overtone, words develop their whole potential when we abstain from observation: "Our unconsciousness is their privacy; our darkness is their light" (*E* 6:97). It is light, after all, that causes the wave function to collapse.

Finally alone, Giles and Isa replay a new scene, engender a new fiction. The setting, again, calls for a restart of history, yet is fraught with literary (mainly Conradian) resonances:

It was night before roads were made, or houses. It was the night that dwellers in caves had watched from some high place among rocks.

Then the curtain rose. They spoke. (131)

Will the two fall again into the old patriarchal, warmongering narrative, or will they create something new? With the apparatus' final debacle, which ends abruptly the incipient new fiction, the choice is left open: it is now up to the reader to decide what will be remembered and what forgotten.

*Indeterminacy in the Detective Novel***Gadda's *Quer pasticciaccio brutto de via Merulana***

In this section, we have dealt with fictional incarnations of probability and duality, and how they modify the very texture of a fictional work. Quantum physics, as a formalism (and a set of *Weltbilder*) made to analyse the stochastic core of reality, has proven to be a dependable guide for a hermeneutics of narrative possibility. Gadda develops his reflections on the antithetic binary of causality and chance by applying these concepts to the entire society, and allowing for more general ethical entailments.

In this last chapter, I am looking into Gadda's philosophical detective novel *Quer pasticciaccio brutto de via Merulana* (*That Awful Mess on the Via Merulana*; 1957). The novel was first published in five instalments in the journal *Letteratura* ("Literature") between 1946 and 1947, then left interrupted halfway. It was republished in an enlarged, updated, and linguistically revised version in 1957, with a great (and unexpected) public success that resulted in the author's unwanted fame.¹ As discovered by Giorgio Panizza (2008), the plot is rooted in real events, the murder of Angela Barrauca and her infant son in Rome in October 1945 by two young women from the countryside.² However, Gadda sets his narrative in 1927 fascist Rome. He also doubles the trouble: the main protagonist

¹ The reconstruction of this more than decennial rewriting is of the most intricate kind, and I will note here only what is strictly necessary to the argument. For a complete description, see the notes to the two main editions, both by Giorgio Pinotti: *RR* 2:1137-69; and Gadda (2018, 315-53).

² The source of inspiration was previously believed to be another murder, that of the Stern sisters, which took place in February 1946 (and would thus require a misdating of the first instalments of "Letteratura"). See Gadda (2018, 315-16, and n. 1).

Francesco Ingravallo, aka Don Ciccio, Molisan officer at the Roman police, is faced first with the jewellery theft against Teresina Menegazzi, middle-aged spinster living at number 219 of Via Merulana, then with the heinous murder-with-theft of her next-door neighbour, Liliana Balducci, whom Ciccio knows personally. Although apparently separate, the crimes are always on the verge of collapsing onto each other, as not one but two law enforcements, police and carabinieri, get involved.³ Let me fast-forward to the final events: Menegazzi's jewels are eventually discovered in a nut-filled chamber pot by the carabinieri's brigadier Pestalozzi, but the author of the theft, most certainly the countryside youth Enea Retalli, is nowhere to be found. Pestalozzi, moreover, lacks the courage to check if among those jewels are also some that could belong to Liliana. Meanwhile, Ingravallo questions his main suspect, Assunta Crocchiapani, Liliana's ex-maid, whom he believes to be in cahoots with the assassin. In her poor house, next to her dying father, she cries out her innocence, leaving the policeman, and the readers, in doubt, and putting an end to the novel:

«No, nun so' stata io!» Il grido incredibile bloccò il furore dell'ossesso. Egli non intese, là pe llà, ciò che la sua anima era in procinto d'intendere. Quella piega nera verticale tra i due sopraccigli dell'ira, nel volto bianchissimo della ragazza, lo paralizzò, lo indusse a riflettere: a ripentirsi, quasi. (RR 2:276)⁴

This suspended finale is an innovation of the final redaction. In the 1946-47 version (whose story includes, with some important differences, what happens in the first five of the final version's ten

³ At the time of the setting, the Carabinieri were part of the national army. The police, united from two previous forces in a single force since 1925 ("corpo degli agenti di pubblica sicurezza"; i.e., "public security agents force"), was under the control of the Ministry of Home Affairs (which, since 1925, had in fact to answer directly to Mussolini). In time of peace, the two forces had (and still have) largely collapsing functions. Since 2000, the Carabinieri are officially a military force outside the army. See for example the official website: <https://www.carabinieri.it/chiamo/oggi/organizzazione/in-generale/cenni-storici>.

⁴ "“No, it wasn't me!” The incredible cry blocked the haunted man's fury. He didn't understand, then and there, what his spirit was on the point of understanding. That black, vertical fold above the two eyebrows of rage, in the pale white face of the girl, paralyzed him, prompted him to reflect: to repent, almost” (Gadda 2007, 388).

chapters) the assassin is almost certainly Virginia Troddu, one among several countryside girls adopted by the childless Liliana as surrogate children (her little “nipoti,” or nephews). In chapter 4 of this first version, indeed, Remo Balducci, Liliana’s husband, reveals his adulterous relation with Virginia (actually Assunta’s cousin), and that she was blackmailing both him and Liliana, hinting at their probable lesbian relationship (RR 2:408-40). Moreover, in *Il palazzo degli ori* (“*The Palace of Gold*”), a screenplay written in 1947-48 and published posthumously, Virginia is eventually arrested and Enea Retalli shot by the carabinieri while fleeing. However, ten years later, Virginia is barely present in the plot, and the entire chapter 4 is removed from the story. We could thus say that the 1957 *Pasticciaccio*’s storyworld, resulting from a re-elaboration that exceeds both the fret of instalment-publishing and the needs of what Gadda saw as a popular medium, is fundamentally different. At first Gadda, pressed by his editor Garzanti, seemed to be planning a second volume, yet he never even started to work on it (or at least left no trace), and afterwards repeatedly stated that he considered the book concluded.⁵ As Robert Rushing summarised, several critics have endorsed the thesis of Gadda’s incapacity to disentangle his own convoluted plots, up to Manuela Bertone’s theory that Gadda generally refuses to conclude as a “symbolic, anticipated self-castration, devoid of constructive value” (qtd. in Rushing 2001, 148; see also Bertone 1993, 145-72, part. 169). However, Rushing writes, such interpretations seem like a defence mechanism on the *readers*’ part:

Gadda's extraordinarily difficult language . . . already poses formidable challenges to a reader who would believe that language and knowledge could be mastered, that a true plenitude could be grasped. How can the reader persist in that illusion when the text inscribes its own lack as part of its formal structure, and denies the

⁵ Thus, just to give an example, he tells to Dacia Maraini in 1968: “*Il pasticciaccio* l’ho troncato apposta a metà perchè il «giallo» non deve essere trascinato come certi gialli artificiali che vengono portati avanti fino alla nausea e finiscono per stancare la mente del lettore. Ma io lo considero finito . . . Sì, letterariamente concluso. Il poliziotto capisce chi è l’assassino e questo basta” (“I have cut *Il pasticciaccio* in the middle on purpose because the «detective novel» shouldn’t be dragged around like certain artificial detective novels that are continued ad nauseam and end up tiring the mind of the reader. But I consider it finished . . . Yes, literarily concluded. The policeman understands who the assassin is and that’s enough”; Gadda 1993, 171-72). Note the irony, as the assassin is anything but clear. See Gadda (2018, 345-48, and n. 33) for more examples.

conventions of the detective genre by insistently offering knowledge that is partial and uncertain? Only with a certain degree of uneasiness, it would seem. (149)⁶

In fact, the *Pasticciaccio*'s is a quantum storyworld, and its incompleteness is a structural requirement. Quantum physics is explicitly called upon since the beginning as a rule for the assessment of reality. In the first pages, the narrator (who is constantly tangled up with the characters, especially through the intrusion of spoken dialects) relates the two main points of don Ciccio's doctrine: first "[I]'opinione che bisognasse «riformare in noi il senso della categoria di causa» quale avevamo dai filosofi, da Aristotele o da Emmanuele Kant, e sostituire alla causa le cause" (RR 2:16);⁷ second, that "un certo movente affettivo, un tanto o, direste oggi, un quanto di affettività, un certo «quanto di erotia», si mescolava anche ai «casi d'interesse», ai delitti apparentemente più lontani dalle tempeste d'amore" (17).⁸ In other words, the philosophy of the "nodo o groviglio, o garbuglio, o gnommero, che alla romana vuol dire gomitolò" (16)⁹ at the centre of the 1927 *Meditazione Milanese* on the one hand; and the blend between physics and Freudian libido that we have learned to recognise in *Eros e Priapo*, on the other.¹⁰ More specifically, while in the latter libido was already treated as a sort of electromagnetic phenomenon, here the focus seems to be rather on its subatomic effects on the analysis of causal sequences: the "quanto di erotia" substitutes the quantum of action as the ultimate limit of human knowledge. Needless to say, the issues of cause and episteme structure the novel both in terms of genre requirement and of direct philosophical investigation.

⁶ Rushing is not alone in his defence of Gadda's meaningful inconclusiveness: see also, among others, Guglielmi (1986, 211-43); Andreini (1997); Bignamini (2005).

⁷ "The opinion that we must 'reform within ourselves the meaning of the category of cause,' as handed down by the philosophers from Aristotle to Immanuel Kant, and replace cause with causes" (Gadda 2007, 5).

⁸ "[T]hat a certain affective motive, a certain amount or, as you might say today, a quantum of affection, of 'eros,' was also involved even in 'matters of interest,' in crimes which were apparently far removed from the tempests of love" (Gadda 2007, 6).

⁹ "[K]not or tangle, or muddle, or *gnommero*, which in Roman dialect means skein" (Gadda 2007, 5).

¹⁰ See chapter 1.4, 118 ff..

Using quantum entanglement as a base, Gabriele Frasca (2011) has already provided a quantum reading of *Quer pasticciaccio*. Considering Assunta and Virginia as entangled, Frasca argues that Ingravallo arrives at Virginia through Assunta's denial. Thus, the solution comes with a declaration of the world's essential interconnection. Frasca's reading is on point about many aspects, and will be used as a basis for my chapter. However, it seems to me that *Quer pasticciaccio* deals instead with the impossibility of complete knowledge, and that quantum physics supports this thesis instead of providing a solution to the mystery. To explain this, I will first summarise Frasca's arguments, as his work remains indispensable, and give my partial counterargument; I will then look at the parallelism between Gadda's epistemology since the *Meditazione milanese* and quantum physics (from a Bohrian point of view); from there, I will move to examine the *Pasticciaccio*'s storyworld through the lens of the opposite pairs continuity/discontinuity and causality/chance, putting them in connection with the notion of libido, or "erotia" and showing how it leads to epistemic disruption. I will then discuss what ethics comes out of this impasse. Both the notion of libido (or erotic charge) and that of sentiment, which were discussed in analysing *Eros e Priapo* ch. 1.4, will be paramount to the analysis.

Entanglement or Uncertainty?

Frasca's interpretation is based on Freudian psychology and quantum mechanics' influence on Gadda.¹¹ Although his reasoning tends to be a bit erratic, he finds a *fil rouge* by connecting history to

¹¹ Indeed, Gadda's readings of quantum mechanics are various and spread throughout the years. The journal *L'elettrotecnica* ("Electrotechnics"), with which he was quite familiar, frequently presented articles on the topics: see for example Corbino (1927); Pugno Vanoni (1927); Persico (1928), which I will quote later on. For what concerns the books, already in 1925, Gadda brought himself up to date with current atomic physics through the technical manual by Leo Graetz and Carlo Rossi, *Le nuove teorie atomiche e la costituzione della materia* ("The New Atomic Theories and the Constitution of Matter"); in 1938 he bought a translation of Louis de Broglie, *I quanti e la fisica moderna* ("Quanta and Modern Physics"; originally published in 1937 as *La physique nouvelle et les quanta*); in 1952, while rewriting *Quer Pasticciaccio*, he was reading a collection of philosophical reflections on causality by physicists, *Natura facit saltus. La certezza del caso*, edited by Umberto Sborgi ("Natura Facit Saltus: The Certainty of Chance"); and in 1957 Heisenberg's *Natura e fisica moderna* ("Nature and Modern Physics"; a translation of *Das Naturbild der heutigen Physik*, 1955);

the concept of the wave function, and focusing on the notion of entanglement as the basic tenet of Gadda's world. He thus tries to find a rule behind what for him is an apparent superficial chaos, "per provare a capire se non sia piuttosto alle *paradossali* leggi del mondo subatomico che sottostà il processo narrativo del *Pasticciaccio*" (2011, 64).¹² To him, entanglement is an innovation of the 1957 edition, pairing Assunta and Virginia, as well as most characters and places.

We have already encountered entanglement, but some extra information could be useful. Although baptised by Erwin Schrödinger, the phenomenon was first considered in the 1935 "EPR" paper, i.e. "Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?" by Albert Einstein, Boris Podolsky and Nathan Rosen. The three answered in the negative, arguing that quantum mechanics could not account for every element of physical reality. They defined reality as such: "If, without in any way disturbing a system, we can predict with certainty (i.e., with probability equal to unity) the value of a physical quantity, then there exists an element of physical reality corresponding to this physical quantity" (1935, 777). Since, according to the uncertainty principle, "*when the momentum of a particle is known, its coordinate has no physical reality*" (778), to EPR either the wave function gives an incomplete description, or all non-commuting, aka conjugate, variables (those affected by uncertainty relations, e.g., position and momentum) cannot have simultaneous reality. They then imagined a thought experiment involving two systems (say S_1 and S_2) which were separated after being in contact for a time. Since the wave function of the joint system $S_1 + S_2$ evolves deterministically (until measurement), knowing it at a certain time means being able to calculate its values for a later time. The problem, for EPR, is that at this point measuring the eigenvalue of a state A on S_1 would lead to a collapse¹³ in S_2 within the joint system, without any

Finally, in 1966, he bought George Gamow's *Trent'anni che sconvolsero la fisica. La storia della Teoria dei Quanti* (translated from the same year's *Thirty Years That Shook Physics: The Story of Quantum Theory*). See Alcini and Giuffrida 2022, *passim*.

¹² "[T]o try and understand if it is not rather to the *paradoxical* laws of the subatomic world that the narrative process of the *Pasticciaccio* is submitted."

¹³ At this time, they were calling it "*reduction of the wave packet*" (Einstein, Podolsky, and Rosen 1935, 779).

interaction with S_2 taking place (i.e. without S_2 even *being there*), and the same if measuring another state B.¹⁴ Thus, with two possible measurements on the first, “the second system may be left in states with two different wave functions. On the other hand, since at the time of measurement the two systems no longer interact, no real change can take place in the second system in consequence of anything that may be done to the first system” (779). In the case in which A and B represented non-commuting variable, this would mean that while for S_1 measuring B would modify the value of A in an undeterminable way – thus making any previous measurement of A useless – the same could not be said for S_2 , where A and B would still both have definite value, meaning that the wave function gives an incomplete description of reality.

Schrödinger took up entanglement later that year. Although in his first formulation he considered the wave function as representing a physical entity, in 1935 he clearly defined it as a purely epistemic “expectation-catalog” ([1935] 1980, 329). He proceeded to argue that “[m]aximal knowledge of a total system does not necessarily include total knowledge of all its parts, not even when these are fully separated from each other” (331). He sustained this by generalising the EPR case for all possible (combinations of) variables, concluding that quantum mechanics completely lacks information on how all variables are related (336).¹⁵ As Jagdish Mehra and Helmut Rechenberg make clear (1982-2001, 6:723-25), EPR’s argument contains the non-spoken condition that reality is local in the strong sense, i.e. no system can in any way influence another without being close to it – thus, in EPR’s view, something must be missing in the description of quantum states. The point is that entanglement proves exactly the opposite, i.e. that *some kind* of nonlocal influence is taking action.¹⁶ I will leave it at that, for now, and turn back to Frasca’s argument.

¹⁴ To oversimplify with an abstract example, if, after a measurement, it turns out that in S_1 $A=+1$ and $B=-1$, then in S_2 it will be certain that $A=-1$ and $B=+1$. Entanglement comes in different forms, but this specific one, corresponding to full entanglement, would be called a “singlet state.”

¹⁵ I would skip Schrödinger’s issues with entanglement and time, for which see (1935, 336-38).

¹⁶ The EPR theorem was finally disproved in 1964 by John Bell, along with any other possible local hidden variable theory (i.e. theories that maintain both locality and the necessity of yet unknown elements of reality).

Once an entanglement logic is in place, to Frasca “determinare la posizione di Assunta . . . è convergere sull'altra [Virginia]” (2011, 88).¹⁷ He bases this on Ingravallo’s plans to go, afterwards, to “la Pavona,” where (supposedly) Virginia resides. Entanglement should also link the story’s two main settings, via Merulana’s rich but ugly building, and the countryside “laboratorio-bettola” (RR 2:148)¹⁸ of the tailor-mizzen-clairvoyant Zamira Pàcori. Libido, economic interest, and gender relations, entangled together, reveal the fascist law’s specious nature and the (homo)erotic instincts behind the police service, also indicated by the constant lapsus between “servizio” and “sevizie” (service/torture) (Frasca 2011, 117-25). Guilt is thus diffused on the whole society, Ingravallo included. This is shown through the second interrogation of Ines Cionini, a seemingly involved prostitute around whom the policemen’s sexual desire becomes tangible; and through the entanglement of Ingravallo with brigadier Pestalozzi, who strips the former of the privileged ethical position he had in 1945: “A un certo punto, chissà quando, nel riprendere le fila della narrazione, Gadda ha comunque cominciato a diffidare di don Ciccio, e dell'intero commissariato” (146).¹⁹ To sustain the thesis of Ingravallo and Pestalozzi’s entanglement, Frasca notes how the two’s movements and actions are synchronised in the last three chapters (151-73).

The main problem with Frasca’s interpretation is that quantum physics provides for him a complete solution. I would instead argue that the mystery, as is left by Gadda, remains unsolvable, which amounts to a programmatic declaration and quite a different worldview. Even without

I have talked here of locality in the strong sense because, although quantum mechanics today recognises influences at distance, it still maintains the tenet of relativity according to which no information can travel faster than the speed of light. I borrow David Albert’s words: “The outcomes of measurements do sometimes depend nonlocally on the outcomes of other, distant, measurements; but the outcomes of measurements invariably *do not* depend nonlocally on *whether* any other, distant, measurements get carried out! . . . The subtlety of these influences is such that . . . *they cannot possibly be exploited to transmit a detectable signal, they cannot possibly be made to carry information*, nonlocally, between any two distant points” (1994, 72).

¹⁷ “Determining Assunta’s position is converging on the other [Virginia].”

¹⁸ “[W]orkshop-tavern” (Gadda 2007, 201). But notice that laboratorio could be translated as “laboratory.”

¹⁹ “At a certain point, who knows when, picking up again the narrative thread, Gadda has started, no matter how, to be wary of don Ciccio, and of the entire police department.”

involving physics, the academic responses seem like empirical proof: after more than 65 years, the choice between Assunta and Virginia (not to count other possibilities) is still hanging, and certainly not because of hermeneutical inadequacy.²⁰ Gadda has given plenty of material for the case of both parties. Even if, instead, we trail Frasca's path, we are forced to admit quantum indeterminacy into the picture. In fact, although entanglement should allow the possibility of knowing a state of an element based on another's, whatever the distance between them, that does not entail complete knowledge. I.e., once a certain eigenvalue of a state obtains through observation (once its wave function collapses), the conjugate variable is stripped of its determinacy, its values now in superposition. To put it bluntly, once Ingravallo knows that Assunta is not the assassin, meaning that it is Virginia, Virginia's position *should not be a matter of fact anymore*. And once she is finally found (let us imagine what Gadda did not appear very eager to imagine²¹), Ingravallo would not be able to make head or tail of her supposed (superposed!) guilt (which, in this picture, takes the role of momentum, the "dynamic" description of a character's actions).

More than from Schrödinger, Frasca's account seems to derive from Bohm's hidden variable interpretation, which entertains possibility of an underlying knowledge that, although humanly unattainable, could be reached through a godly point of view (knowing, that is, the position of a particle without collapsing the wave function).²² And in fact, that is more or less what he does, as he

²⁰ Just very few examples. Apart from Frasca, Virginia is the guilty party for Donnarumma (2006, 73); Pedriali (2007, 19-35); Pinotti ([2003] 2008). Assunta is to blame for Amigoni (1995); Lucarelli (2004); Marchesini (2014). Marchesini, especially, dedicates a few pages (63-69) to disprove Pinotti's argument, and adds Diomede Lanciani as accomplice. Both Assunta and Virginia are equally guilty for Panizza (2008). Bignamini (2005), instead, is more inclined towards Enea Retalli; Following Agosti (2016) and his focus on Gadda's "indecidibilità" (impossibility of choice), Cortellessa (2017) suggests we should throw in the towel, and that not even Gadda knew. This is quite different from my thesis: more than in whether Gadda could or could not say, I am interested in the fact that Gadda *would not* say.

²¹ His cousin Piero Gadda Conti refers of a conversation in 1961 where Gadda confessed: "Del *Pasticciaccio* non voglio più sentir parlare" ("I don't want to hear about the *Pasticciaccio* ever again"; 1974, 114).

²² Not that Bohm would allow for it. To borrow again from Albert, who is gifted with concision, "the Bohm theory (even though it's a completely deterministic theory) will systematically and invariably and unavoidably prohibit us from ever predicting the outcomes of future measurements of the positions of particles any more accurately than those wave

profits from elements that are outside the storyworld altogether: Virginia is clearly the guilty part in the 1945 version of the *Pasticciaccio* and in *Il palazzo degli ori*, not much so in the final novel. Actually, Virginia as a character seems, as Manuela Marchesini (2014, 66) wrote, to be reused for Assunta, so that when Ines Cionini refers to a “zingara” met “a la Pavona” (*RR* 2:164) whose eyes “[c]iaveveno come un’idea, dentro, de volesse vendicà de quarcuno” (162),²³ she could well be referring to Assunta.²⁴

There is no certainty whatsoever that Virginia is still the guilty party in a storyworld that is (in)completed more than ten years later. In the end, what the latter gives us is one suspect, Enea Retalli, who has certainly committed the theft but is at the moment unfindable (determinate guilt, indeterminate position)²⁵ and another, Assunta Crocchiapani, who is localised precisely but on whom all assumptions are left suspended (determinate position, indeterminate guilt): a situation that perfectly mimics quantum uncertainty.

This hinders but certainly does not cancel the value of Frasca’s interpretation, especially when it comes to elucidating Gadda’s “quanto di erotia.” In fact, Frasca’s work (with the reservations just made) will sustain the following analysis, while we take a different direction. That is, instead of looking at how the *Pasticciaccio* could be solved, we are going to see why it is unsolvable. As usual, imagination will be the key item: how can one of the most abstract, symbolic and non-visualisable physical theories ever conceived be expressed in a storyworld, language made life?

functions allow us to do; it will (that is) prohibit us from ever predicting those outcomes any more accurately than the uncertainty relations allow us to do” (1994, 168).

²³ The “gypsy” met “somewhere around Pavona” (Gadda 2007, 224) whose eyes “had an idea, in them, of getting revenge on somebody” (223).

²⁴ This is not the only characteristic that passes from Virginia to other characters. For example, while in “Letteratura” she is the daughter of a railroad signal-keeper (*RR* 2:439), this becomes the attribute (demoted from daughter to nephew) of Camilla Mattonari, a character introduced in the final edition. It seems that Gadda, following a routine that we have already seen for *L’Adalgisa*, was feeding his older narrative material to his later creation.

²⁵ As Frasca (2011, 68) correctly notices, the “quanto di erotia” is connected to greed.

Gadda's System and Bohr's Phenomenon

Ingravallo's first rule of thumb reworks the core of Gadda's *Meditazione Milanese*: reality as a tangle, or “gnommero,” of systems with continuously deforming relations. Some elements have already been mentioned, but I am going to look at them in more depth. We should remember now what Carla Benedetti said about Gadda's refusal of complete knowledge, in opposition to Gian Carlo Roscioni.²⁶ Gadda makes the point clear in the 1928 *Meditazione milanese*, where he adopts such a general theorem: “Ogni sistema filosofico cioè ogni sforzo conoscitivo integratore della realtà ha un punto maligno o un punto difettoso” (*SVP* 740).²⁷ Any system, although we like to figure it as close, “è in realtà apertissimo e indeterminato” (741).²⁸ Only a systemics adopting such “impossibile chiusura d'un sistema” (741)²⁹ as a foundation can actually work. To be clear, since *everything* is a system, *nothing* can be fully enclosed in cognitive terms.

This concept incorporates another: “Procedere, conoscere è *inserire alcunché nel reale*, è, quindi, *deformare il reale*” (863).³⁰ If a system is definable by its relations, knowledge implies establishing a number of them between an object/system and another, and (at least) between the object and the knowing subject. Therefore, the object is changed in the act of knowledge itself – as is the subject. For these reasons, Gadda writes: “Io chiamo ‘costruzione o invenzione’ indifferentemente la scoperta d'un nuovo significato d'un oggetto (o sistema di relazioni) sia esso già esistente, sia esso semplicemente possibile” (748).³¹ Every connection that is acted/imagined makes a system anew, a break-point in an idle flowing of possibility and preparations, like matter is turned into life: “È il

²⁶ See Benedetti (2004) and chapter 2.4, 197.

²⁷ “Every philosophical system viz. every cognitive effort integrating reality has a vicious point or a defective point.”

²⁸ “Is in fact very much open and indeterminate.”

²⁹ “[I]mpossible closure of any system.”

³⁰ “To proceed, to know, is to *insert something into reality*, it is, as such, *deforming* reality.”

³¹ “I call ‘construction or invention’ indifferently the discovery of a new meaning of an object (or system of relations), be it already existent, be it simply possible.”

mistero del nascere. Nascere significa organizzarsi in sistema d'una somma di relazioni" (750).³² For Gadda, the border between knowing, being, and acting is rather weak.

These two ideas (impossible closure, mutual deformation/creation) can easily be paralleled with Bohr's reflections on complementarity. Again, let me expand on the concept. As Karen Barad notes, Bohr's uncertainty is not equal to Heisenberg's: indeed, Barad considers calling the former indeterminacy.³³ Heisenberg relates uncertainty to an unavoidable *physical* disturbance of the observed object. Instead, "Bohr introduces a second, arguably more fundamental, issue: that of the conditions of possibility for determining the effect of the measurement interaction" (Barad 2007, 117). That is, the kind of relation that the scientist creates between the object and the apparatus determines the kind of semantics defining the object. This leads to complementarity: characteristics that are both necessary to define a phenomenon in the classical sense cannot exist simultaneously, as they depend on mutually exclusive experimental arrangements. No object can be singled out, but always needs to be put in a system with something else to receive a certain identity (to express certain attributes). This denies the very notion of independent reality proposed by EPR, and redefines entanglement as a consequence of quantum indeterminacy.³⁴ Bohr will later define the object-apparatus interaction as the real "phenomenon" (see Barad 2007, 118). This includes the definition of matter and light as particles or waves. In Bohr's words:

Just as in the case of light, we have . . . in the question of the nature of matter, so far as we adhere to classical concepts, to face an inevitable dilemma, which has to be regarded as the very expression of experimental evidence. In fact, . . . we are not dealing with contradictory but with complementary pictures of the phenomena, which only together offer a natural generalisation of the classical mode of description. In the discussion of these questions, it must be kept in mind that, according to the view taken above, radiation in free

³² "It's the mystery of birth. To be born means that a sum of relations is organised in a system."

³³ In fact, Heisenberg (1927) originally used the word *Ungenauigkeit*, which is semantically closer to inaccuracy: uncertainty was but the first translation of the term into English, and remains the most used.

³⁴ See Bohr (1935, 700); see also Barad (2007, 274-75); or Mehra and Rechenberg (1982-2001, 6:734-38) for additional information.

space as well as isolated material particles are *abstractions*, their properties on the quantum theory being *definable* and observable *only through their interaction with other systems*. Nevertheless, these abstractions are . . . indispensable for a description of experience in connexion with our ordinary space-time view. ([1928] 1985, 116; my emphasis)

This was Bohr's first public presentation of complementarity. It took place in Como on the 16th of September 1927 at the congress for the centenary of Alessandro Volta's death, and was republished in various venues by 1928 (including the conference proceedings in Italy and *Nature*). Frasca (2011, 55-59, and n. 45) already noted the coincidence between the year of this conference, as well as of the Solvay conference, and of the novel's setting. I would not go as far as saying that these events were the main reason for Gadda's choice of date,³⁵ but it should be noted that the Como conference was widely publicised by the regime as a symbol of the fascist scientific endeavour (see Gamba and Schiera 2005). Einstein, in fact, refused to go as a political statement, and was the only absent big name. Not only was Gadda in Milan at the time,³⁶ but the journal *L'Elettrotecnica*, which he used to read, first publicised, and then summarised the event, and published various articles on quantum mechanics after it.³⁷ Thus, we have a consistent field of force attracting Gadda towards these topics

³⁵ 1927 is fervid with events: not only was Gadda studying philosophy, and probably thinking already (not writing yet) about the *Meditazione milanese*, but he also published that same year the essay "I viaggi, la morte," some ideas of which are reposed almost unchanged in the *Pasticciaccio* (more on this later). It is also the year of the beginning of the tax on celibacy, one week before the first scene of the novel (see ch. 1.4 117, n. 73). Most of all, 1927 is the year of the arrest of Gino Girolimoni for the supposed abuse and murder of various little girls since 1924. Although Girolimoni was later cleared, he lived the rest of his life in misery. The case of the "monster of Rome" became a sort of Italian counterpart of Jack the Ripper, with the extra feature that Mussolini, to uphold the propagandistic image of a Rome free of crime, forced the hand of the investigators. Gadda dedicates a few pages to the case in the novel – using the pseudonym Pirrofici for Girolimoni – and especially to the dictatorial control of the police and the reactions of the public opinion (*RR* 2:92-94).

³⁶ He wrote from there to the Ammonia Casale, the company in which he worked, on September the 23rd, and referred to letters received there days before. See Gadda (1982, 18-19).

³⁷ See Pugno Vanoni (1927) on the summary of the congress; see also Corbino (1927) and Persico (1928) as examples of articles. Persico (1928), in particular, provided a quite detailed mathematical account of wave mechanics according to Schrödinger's theory.

around the writing of the *Meditazione milanese*, especially considering his receptivity towards physics. Bohr's name (but not complementarity) also comes up in Gadda's treatise.³⁸

Whether or not Gadda knew about Bohr's theory already in 1928, his ideas are extremely close to it: observer and observed, knower and known, are bound to form one system, a unified entity. Particularly important is the *acausal* character of this state. In Gadda's opinion, "dobbiamo negare che esista un mero semplice . . . L'atto della coscienza è un atto di polarizzazione (almeno); è una crisi euristica o giudizio euristico contrapponente alcunché ad alcunché, anche sé a sé" (*SVP* 829).³⁹ Such polarity is not a cause-effect relation, but "un coesistere logico: così come nel magnetismo . . . la polarità è intrinseca differenziazione dell'essere, implicante coesistenza logica. (Nessun fisico direbbe che il magnetismo positivo è *la causa* del negativo)" (*SVP* 664).⁴⁰ As Raffaele Donnarumma wrote, through this substitution of cause with coexistence "il concetto di causa si svuota . . . e si dilata mostruosamente nel sistema delle concause, aselettivo e onnipervasivo" (2006, 40).⁴¹ Although Donnarumma derives this conception directly from an overturning of Leibniz's monads and pre-established harmony, it seems that Gadda was responding to the ampler scientific advancements of his time. Seen in that light, concause/polarity does not simply evolve from the expansion of a classical concept, but comes to define a new kind of relation which corrodes the very notion of singular identity: a *systemic existence*, where encounters are the only reality facing the darkness of the external system.

Such ideas remain pivotal in Gadda throughout the years, soon turned against the "I"'s idol. This is clear in the 1950 essay "Come lavoro" ("How I work"), where, once again, Gadda considers his ideas as developed in line with "[I]e teorie fisiche, cioè fisico-matematiche, biofisiche, psicologiche,

³⁸ Bohr is quoted for his atomic model in *SVP* 701.

³⁹ "We have to deny that a mere simple exists . . . The act of consciousness is an act of polarisation (at least one); it is a heuristic crisis or heuristic judgement opposing anything to anything, even the self to the self."

⁴⁰ "[A] logical coexisting: as in magnetism . . . polarity is intrinsic differentiation of one being, implying logical coexistence. (No physicist would say that positive magnetism is *the cause* for the negative)."

⁴¹ "[T]he concept of cause becomes void . . . while it monstrously expands in the a-selective and all-pervasive system of the concauses."

psichiatriche recenti” (*SGF* 1:428).⁴² His idea of the self as polarity operates here both in cognitive and narrative terms. Writing, like every other connection, results from polarisation:

L'atto critico, l'atto espressivo, non è concepibile per sé . . . è il risultato, o meglio il sintomo, di quella polarizzazione che ho detto: quella che si determina fra l'io giudicante e la cosa giudicata: fra l'io rappresentatore e la rappresentata. L'io giudicante non preesiste in una attesa logica, o in una incubazione partenogenetica, alla cosa giudicata, narrata. L'io ha veste di modo, di strumento potenziale del giudizio: e nel giudizio soltanto si manifesta, come termine polare della tensione fra lui e la cosa . . .

Mentre si concede all'io (all'umana vanagloria dell'io) riconoscere in sé medesimo il duellante migliore . . . è bene spesso la cosa giudicata, viceversa, che ha inchiodato al muro lo scrittore, il critico. Lo ha risospinto ai giudizi disperati, donde non può uscire a salvezza. (429-30)⁴³

Notice how close we are to a description of the I as an *apparatus* which allows for an object's conditioned expression. Gadda, differently from Bohr, extends such phenomenon outside the laboratory. Moreover, he does not allow the writer/experimenter to be safe outside, to simply read the result in an (imaginary) machine.

Such idea of narration is embodied in the *Pasticciaccio*. Against Frasca (2011, 49, and n. 39), who emphasises the similarities of Gadda's later narrators, I would argue that there are fundamental differences in this novel, probably because of its overt relations with quantum mechanics. In *L'Adalgisa*, as we saw, the narrator is progressively revealed as a homodiegetic figure, and the narrative proceeds by abrupt refocalisations (or, physically, changes in the system of reference). In

⁴² “The recent physical, i.e. physico-mathematical, biophysical, psychological, psychiatric theories.”

⁴³ “The critical act, the act of expression, is not thinkable in itself . . . it is the result, or better the symptom, of that polarisation that I named: what which establishes itself between the judging I and the judged thing: between the representing I and the represented thing. The judging I does not pre-exist in a logical expectation, or in a parthenogenetic incubation, to the judged, to the narrated thing. The I has the role of a mode, of a potential instrument of the judgement: and only in the judgement is it manifested, as a polar term of the tension between it and the thing.

While it is conceded to the I (to the I's human vainglory) that it could recognise the best duellist in itself . . . oftentimes it is the judged thing which has pinned the writer, the critic, to the wall. It pushed him to desperate judgements, from which he cannot escape to safety.”

the *Pasticciaccio*, however, not only is the narrator heterodiegetic (thus has a different ontological status in the storyworld), but his voice is never his own, constantly melting into the voice of the characters. This overly diffused free indirect speech operates at the linguistic level in the diastratic, diaphasic, and especially diatopic variable, a polyphony which makes it impossible to clearly distinguish the voice anywhere. *La cognizione del dolore*, Gadda's other main novel (1938-1941, published in 1963), similarly tends to confuse the narrator's voice with the crowd or the protagonist. However, this is generally temporary and justified in terms of gossip's deforming power or of Gonzalo's unstable hyper-narcissistic ego, and is oftentimes corrected by (delayed) textual hints.⁴⁴ Here, instead, the process is constant and confusing, and no help is given to clearly determine the *ehr-form*'s boundaries. It comes to the point that some characters' private feelings invade the discourse *only because they are being thought about by others*. The clearest example is the first, long description of Zamira Pàcori and her shady activities during Ines' first questioning at the police station. First taken from Ines' own tale, Zamira's profile is then depicted through the common chitchat within the police (since the force regularly visits her countryside laboratory-tavern) and the narrator's constant intrusions, shaping rumours as legend by interspersing the dialectal narration with high register words, Latin formulas, and neologisms (*RR* 2:148-49). Eventually, however, Zamira ends up contaminating the narrator's speech, becoming the overpowering pole, even if she is yet to physically appear in the story. The discourse's object becomes the subject:

e magari di maiala, anche, la titolavano, una Zamira Pàcori! e di vecchia ruffiana, bah, una sarta come lei! una maga orientale con diploma di prima classe! Bella gratitudine. E aveveno er grugno pure de dì che li Du Santi... ereno... un par de «nun zo se me spiego», accompagnando l'asserto con una manucaptazione-prolazione invereconda del paro stesso, per quanto involtolato nel «cavallo»: invereconda, oh sì, ma non

⁴⁴ See ch. 2.4, 203. There are exceptions: in some cases, the narrator seems to tap into some unknown metaphysical source. Federico Bertoni (2011) has found the connection between such moment and the semantic field of the shadow, and linked it to Jung's archetype, "come se Gadda avesse caricato l'ombra di connotazioni e risonanze mitico-simboliche che giungono da lontano" ("as if Gadda had charged the shadow of far-reaching mythical-symbolical connotations and resonances").

infrequente, allora, nell'uso del popolo. Calunnie. Bocche sporche. Teppa de campagna, che la notte va a rubbà li polli. (149)⁴⁵

Notice, here too, how the Roman dialect, with its anacoluthons and colourful insults, intermixes with narratorial high-register terms (“asserto”; “invreconda”) and Latin-derived neologicistic combinations (“manucaptazione-prolazione”): a delicate equilibrium of voices, whose borders remain indeterminate. Stefano Agosti has prized Gadda for pursuing a narrative enunciation which “*si è estroflessa nel linguaggio, il quale comprende . . . anche il Soggetto che parla*” (2016, 28),⁴⁶ and of having thus reached what Lacan would later call the Real, “inteso come il luogo di affermazione dell’indecidibilità del senso e dell’impossibilità della verità” (30).⁴⁷ I would rather retrace that very undecidability to the indetermination which marks quantum complementarity, reconsidered through Gaddian polarity, and the unity of subject and object in the phenomenon.

Quantum Jinx

Indeterminacy breaks the cause-effect continuum, overthrowing the possibility of a deterministic view of the universe. Every time an object is measured by an apparatus (Gaddianly, every time it becomes part of a system), the causal chain is broken by the introduction of a new relationship: there is no autonomous object to look at anymore. In the storyworld’s ontology, discontinuity runs parallel to the binary of causality and chance, which is best represented by the notion of the wave function

⁴⁵ “[A]nd even perhaps titling her the old sow, her, Zamira Pàcori! and old procuress, hah! a seamstress of her position! and Oriental wizardess with a diploma of the first degree! Some gratitude. And they even had the nerve to say that the Due Santi, the two saints of the locality... were... a pair of ‘if you follow my meaning,’ accompanying this assertion with an immodest manucaption-prolation of the pair in question, wrapped though they were in the crotch: immodest, oh yes, but not infrequent then, in popular usage. Slander. Foulmouths. Hick scum, that go out at night to steal chickens” (Gadda 2007, 203).

⁴⁶ “[E]xtroflected itself onto the language, which includes . . . the speaking Subject too.”

⁴⁷ “[I]ntended as the place where the undecidability of the sense and the impossibility of truth are affirmed.”

collapse. As we have seen from the past chapters (libido and field theory in *Eros e Priapo*; the search of relativistic invariants in *L'Adalgisa*) Gadda certainly did not refuse continuity as a view. However, polarity and impossible closure are also proof that for him, at some point, such vision had to surrender.⁴⁸ At their core, events result from a spark of connection (a polarisation) within an infinite-directional set of possibilities, which could have been preparing for ages (“il mistero del nascere”; *SVP* 750). After all, from a quantic perspective, the wave function too, being deterministic, represents a continuum of possibilities. However, once a measurement is made (once, Gaddianly, a polarity is established), it has to collapse into the event.⁴⁹ While there seems to be a cause-effect relationship between events following each other in time, the underlying process is much more complex to define. For Gadda too, from an out-of-time perspective, reality must result in an “ermeneutica a soluzioni multiple: come un enigma che avesse un numero infinito di soluzioni”;⁵⁰ only in spacetime can we reach the contemplation “d’una storia, d’uno sviluppo (o regresso)” (*SVP* 748).⁵¹ Yet, that causal/teleological ordering is “una funzione *storica* del pensiero, non un assoluto. Nei millenni futuri l’applicazione del principio di causa apparirà una grossolana superstizione” (651).⁵² Every attribute, both in the wave function and in Gaddian reality, must eventually be answered with existence or

⁴⁸ A similar discourse is found in the *Meditazione*’s chapter on the atom, as “l’atomo è l’ultimo nucleo che deve mettersi d’accordo con il sistema totale della realtà, che ha dei doveri. Al di là dell’atomo non vi sono più doveri per i suoi frantumi . . . Cioè ho chiamato atomo la molecola dei fisici, l’atomo dei fisici, l’elettrone dei fisici, in somma il limite semovente del sistema razionale totale semovente.” (“the atom is the last nucleus that has to agree with the total system of reality, that has some duties. Beyond the atom there are no duties for its fragments . . . That is, I have called atom the physicists’ molecule, the physicists’ atom, the physicists’ electron, hence the self-propelled limit of the total rational self-propelled system”; *SVP* 715).

⁴⁹ I am, again, oversimplifying: the exact moment of the collapse, constituting the so-called – and fundamentally unsolvable – “measurement problem” is at the core of various different quantic interpretations, most of which came after the *Pasticciaccio*.

⁵⁰ “[A] multiple-solution hermeneutics: like an enigma with an infinite number of solutions.”

⁵¹ “[O]f a story, of a development (or regression).”

⁵² “[A] *historical* function of thought, not an absolute. In future millennia the application of the principle of cause will appear like a rough superstition.”

inexistence, yes or no, once the encounter is enacted, but that will depend on the global system of possibilities hovering *in potentia* over reality. As Gadda wrote in “L’egoista” (1953),

ognuno di noi è il no di infiniti sì, e il sì di infiniti no. Tra qualunque essere dello spazio metafisico e l’io-individuo (io-parvenza, io-scintilla di una tensione dialettica universale) intercede un rapporto pensabile: e dunque un rapporto di fatto. Se una libellula vola a Tokyo, innesca una catena di reazioni che raggiungono me. (*SGF* 1:654)⁵³

This last concept, in line with chaos theory’s butterfly effect (anticipated by Alan Turing in 1950) was actually a constant preoccupation for Gadda since the *Meditazione* (see Baldi 2021, 19-25). The causal chain-reaction that Gadda talks about, semantic relict of what will someday be rough superstition, derives from the polar clash-encounter of systems like “quanti d’acqua in un ruscello” (*SVP* 752)⁵⁴ which sublimates existence from the metaphysical space of virtuality.

For most of *Quer pasticciaccio*’s characters, the supposed causal chain takes the form of destiny: an entity which, first and foremost, is out to get you. Gadda plays with the stereotypical Italian fear of bad luck as a lens to describe chance. Ingravallo’s reformulation of cause takes a similar path, while he misogynistically psychoanalyses Menegazzi’s fear of theft as a repressed desire of sexual violation which had, in turn, guided the events with its quantum of eros:

La lunga attesa dell’aggressione a domicilio, pensò Ingravallo, era divenuta . . . coazione al destino, al «campo di forze» del destino. La prefigurazione d’ ’o fattacce s’era dovuta evolvere a predisposizione storica: aveva agito: non pure sulla psiche della derubanda-iugulanda-sevizianda, quando anche sul «campo» ambiente, sul campo delle tensioni psichiche esterne. Perché Ingravallo, similmente a certi nostri filosofi, attribuiva un’anima, anzi un’animaccia porca, a quel sistema di forze e di probabilità che circonda ogni

⁵³ “[E]ach of us is the no of infinite yeses, and the yes of infinite noes. Between every being of the metaphysical space and the I-individual (I-semblance, I-spark of a universal dialectical tension) intercedes a thinkable relation, thus an actual relation. If a dragonfly flies in Tokyo, it triggers a chain of reactions that reach me.”

⁵⁴ “[W]ater quanta in a creek.”

creatura umana, e che si vuol chiamare destino. In parole povere, la gran paura le aveva portato scarogna, alla Menegazzi. (*RR* 2:31-32)⁵⁵

Note how the force-field metaphor, which in *Eros e Priapo* was used to describe the psyche's hidden influences, is here applied to the mechanisms of chance. As a "sistema di forze e di probabilità," destiny, similarly to Valéry's *implexe*, surrounds human beings like a wave function ideally surrounds a particle.⁵⁶ As a quantised (and as such, discontinuous) form of energy, libido makes the event collapse like an atmospheric accident, a "tromba di depressione ciclonica" (17).⁵⁷

The novel's construction constantly defuses the idea of a simple thread of causes and effects. As Amigoni wrote, there is a "sorta di ossessione del duplice" (1995, 36),⁵⁸ as most of the storyworld's elements come up in pairs. The only constant regarding them is doubt: whether one or the other is the recipient of a certain attribute (guilty/innocent, present/missing, etc.) whether they are connected, which causes which, and so on. Linear connections are constantly disregarded, while the couples tend to multiply exponentially. A series of name-nickname denominators brutally tests the reader's memory, proving it difficult to even maintain stable identities in the characters' observation.⁵⁹ The two crimes, incarnated by Liliana's and Menegazzi's doors in the same landing, are the clearest example. As Federico Bertoni wrote, the landing of Via Merulana 219's third floor, stairs A, really is

⁵⁵ "The long wait for house-breaking and aggression, Ingravallo thought, had created . . . a compulsion for destiny, for destiny's 'field of forces.' The prefiguration of disasters must have evolved into a historic predisposition: it had acted: not only on the psyche of the woman to be robbed-strangled-tortured, but also on the 'field' of atmosphere, on the field of the external psychic tensions. Because Ingravallo, like certain of our philosophers, attributed a soul, indeed a lousy bastard of a soul, to that system of forces and probabilities which surrounds every human creature, and which is customarily called destiny. To put it simply, her great fear had brought bad luck to her, to Signora Menegazzi" (Gadda 2007, 27-28).

⁵⁶ We could wonder whether Gadda believed, like David Bohm, in the ontological actuality of destiny, i.e. of a "pilot wave" *actually* surrounding particles. As my argument should make clear, however, Gadda's storyworld leaves the question unsolved, as there is no way for human beings to obtain that kind of knowledge.

⁵⁷ "[A] tornado, . . . a cyclonic depression" (Gadda 2007, 6).

⁵⁸ "[K]ind of obsession for the double."

⁵⁹ For the (long) list of examples see Amigoni (1995, 37 ff); and Marchesini (2014, 46 ff).

a “punto di disgiunzione dei possibili” (2001, 275).⁶⁰ The thief knocked on both doors, but only Menegazzi answered. Did the assassin knock at Menegazzi’s too, finding no one? The causal connection between the two crimes remains unsolved.

The link between chance and discontinuity (caused by observing a quantum world) is explicit in the novel. At Menegazzi’s, Ingravallo finds a tram ticket punctured at Torraccio (a place in the Roman countryside), left by the thief. Thanks to a green scarf seen by some testimonies and later connected to Zamira’s dyeing laboratory, the thief is identified as Enea Retalli. At that point, doc. Fumi, Ingravallo’s superior, recalls that Ines Cionini, arrested a few days before for unlicensed prostitution, is from the same place. The interrogation links her to Zamira and to another man, her boyfriend and pimp Diomede Lanciani, who apparently went to Menegazzi’s apartment as an electrician (or gigolo *in potentia*). Diomede’s brother Ascanio, too, frequented the palace. She also refers to the already quoted gypsy met at the Pavona (Virginia? Assunta?), who seems to be connected to the murder. Thus, a person arrested by chance from sweeping checks provides information, and maybe some kind of connection, between the two cases. The narrator puts it as such:

Il caso (non datur casus, non datur saltus) be’ viceversa pareva esser proprio lui quella notte a sovvenire i perplessi, a raddrizzare le indagini, mutato spiro il vento: il caso, la fortuna, la rete, un tantinello smagliata, un tantino sfilacciatella del pattuglione, più che ogni sagacia d’arte o capillotomica dialessi. (RR 2:185)⁶¹

By tracing the bracketed sentence back to Kant’s *Critique of Pure Reason*, Alberto Godioli has argued that the *Pasticciaccio* “ultimately conveys the idea that the world is a continuum” (2015, 694). Indeed, Godioli does not ignore the quantic references, but cleverly notices that Gadda himself connected, in his notes to the *Critique*, Kant’s distinction between *quanta continua* and *quanta*

⁶⁰ “Point of disjunction of the possibilities.”

⁶¹ “Chance (*non datur casus, non datur sal[t]us*) well, on the other hand, it seemed to be chance itself that night which succored the puzzled, straightened out the investigations, changing the turn of the wind: chance, luck, the net, a little unraveled, a little frayed, of the patrol, more than any artful wisdom or hairsplitting dialectic (Gadda 2007, 256).

discreta to molecules and atoms, respectively (697). Quoting various sentences in which the narrator seems to hint at the world's continuum, Godioli thus arrives at a Gaddian worldview of reality as flux.⁶² Yet, quantum mechanics does not accept such a model as the ultimate reality, and Gadda himself, at least in the *Pasticciaccio*, completely overturns this possibility. In the quoted passage, the impossibility of chance and of a break in the continuity of nature – *natura non facit saltus*, before Kant, comes from Leibniz, who rejected atomistic theory⁶³ – is promptly denied by the facts (as suggested by the passage itself: “be’ viceversa . . .”). The same happens in all the other passages where continuity is hinted at. The most important case (quoted by Godioli only in part) is, rather Gaddianly, in an apparently useless, yet to us familiar, divagation. It is the description of Ingravallo’s landlady, walking to the kitchen on the morning of Ciccio’s accusation to Assunta:

Ella annullava l’eternità del corridoio a piastrelle e relativo olezzo (pipì di gatta e petrolio) con traslazioni silenziose, alate d’improbabilità e di miracolo, che parevano celebrarsi in un campo gravidico smesso e oramai addirittura inoperante, quasi d’uno scalamitato magnete. Trascorreva così fino alla cucina e alle cùccume per passettini fluidissimi, che la lunga vestaglia di flanella rosa veniva sottraendo l’uno dopo l’altro alla percezione altrui: e ne residuava in corridoio, come uno strascico ritardatario, l’idea proprio della continuità nel senso infinitesimale del termine. (RR 2:260)⁶⁴

⁶² The argument is repeated in Godioli (2018).

⁶³ “In nature everything happens by degrees, and nothing by jumps; and this rule about change is one part of my law of continuity” (Leibniz [1765] 1996, book 4, ch. 16, 473). Curiously enough, as I have noted in this chapter (306, n. 11) among Gadda’s books was a collection of articles in contemporary physics edited by U. Sborgi in 1952, and entitled *Natura facit saltus. La certezza del caso* (“*Natura Facit Saltus. The Certainty of Chance*”). It is not sure when Gadda wrote chapter VII of the *Pasticciaccio*, from which I took the quotation, but it is possible that he was inspired to quote the phrase by that reading. See Alcini and Giuffrida (2022, 179).

⁶⁴ “She annulled the eternity [of the tiled hallway] with the relative odor (cat pee and kerosene) with silent transferences, winged with improbability and with miracle, which seemed to be celebrated in a field of gravity now disused, and even unfunctioning, as if of a demagnetized magnet. She passed thus as far as the kitchen and the pots on flowing little steps, which her long bathrobe of pink flannel withdrew one after the other, from the perception of third parties; and there remained in the hall, like a belated trail, the very idea of continuity in the infinitesimal sense of the term” (Gadda 2007, 364).

Reexperiencing *L'Adalgisa*,⁶⁵ we are back to a tiled hallway, smelling of pee (of cat, instead of baby), and where gravitation becomes inconsistent. The landlady, walking with a “fluenza e levità di fantàsima” (260),⁶⁶ seems to reach an ideal continuity of movement, occupying space in a perfect fluency. Yet, this is but an illusion provided by the bathrobe: *behind the veil* are invisible, and discontinuous, steps. The old lady walking down a corridor, like the De' Marpionis staggering on the hexagonal tiles, is a hypotyposis of reality, a quantum image.⁶⁷ Gadda's world is indeed Heraclitean, but in a Brownian/stochastic sense, a “πάντα δε πόλεμος” (war of everything against everything) that, like Fumi's Neapolitan parlance, allows to “opinare in qualunque direzione” (104).⁶⁸ In such a world, where there is no direction because there is no road to follow, encounters spark an event into existence. And if human beings can delude themselves with the possibility of finding the rule for a universal connection, their deepest drives must give them pause.

We should now remember that, as we have seen in ch. 1.4, in the *Meditazione milanese* Gadda resorted to what he called “sentimento,” or sentiment, to provide human beings with a guide while striving towards the system $n+1$. Already in *Eros e Priapo*, however, recognising libido as the form of energy shaping the activities of the ego and the main drive to human action, Gadda denounced its uncontrolled influence as the cause for fascism and historical regression in general. He did so with an analogy between history and quantum mechanics (see ch. 1.4, 126). At that time, sentiment became the result of libido's successful sublimation, as Gadda still seemed to believe in a positive (or positivistic) control of libido. However, *Quer Pasticciaccio* – first tentatively, then definitively in its final version – leads this view to its extreme consequences for both knowledge and history, dealing with the fundamental uncertainty that libido brings about at a subatomic (and micro-historical) level. Now, the discontinuity of history has found a deeper explanation: the quantum has come to

⁶⁵ See ch. 2.4, 213 ff.

⁶⁶ “[F]luidity and lightness as of a ghost” (Gadda 2007, 365).

⁶⁷ A reality whose primal violence is not hidden. There is another point in the *Pasticciaccio* where tiles appear, and they are hexagonal: it's Liliana's kitchen, and the tiles are splashed with her blood (see *RR* 2:69).

⁶⁸ “[F]orm opinions in any direction” (Gadda 2007, 136).

characterise the very core of the erotic charge. The recognition of libido as the energetic essence of human psyche in a quantic, thus ultimately indeterminable, fashion represents the actual evolution of Gadda's thought. Not a failure to reach a hoped total knowledge, as in the traditional Roscionian view, but a turning against the lingering positivism of his own beliefs. In other words, the quantum of eros leads away from linear progression and towards discontinuous and indeterminable change.

As an element of chance dislodging determinism, libido breaks the line of family, race, and patrimony that the fascist and catholic society took as a natural end. As Frasca (2011, 135 ff.) has noted, *Quer pasticciaccio* is a palinode of Gadda's older idea of procreation as the necessary $n + 1$, as the novel systematically denies the continuity of procreation to all the characters, with the only exception of Assunta's plagued and dying father. Liliana, indeed, is a victim of the system's pretended teleology. Soiled by her (but more probably her husband's) infertility, she is torn between the patriarchal imposition-made-desire of a child – “coscienza ineffabile della grande missione della donna” (*RR* 2:131)⁶⁹ in her priest's words – and the impossibility to do so without defiling her marriage. Suffering through the sexual tension between her and her cousin Giuliano, she eventually hopes in vain that he would give her his first born as a present. This leads, if we follow Ingravallo's interpretation of her melancholy, to her surrender to death, the final discontinuity. Thus, a branch of the Valdarena line is broken, and the family has lost its linearity and unity. The narrator shows this by assuming the perspective of the old Valdarena aunts:

Rivogliono, rivogliono il fiore! Col suo scerpato stelo! Il quanto perduto di lor vita. Come limatura sul magnete, le minime fibrille dei loro visceri si polarizzano alla *tensione del rientro*. Sentono di dover risucchiare indietro la unità gamica estromessa, la unità biologica . . . Rivorrebbero a loro disposizione la possibilità, la valenza nuziale profferta ad altro, allo sposo . . . E l'unità gamica di cui si rivendica la pertinenza

⁶⁹ “[I]neffable awareness of woman's great mission” (Gadda 2007, 176).

include altresì un quanto economico. Era una splendida figliola, ed era un cofano di gioie: l'una e l'altro maturati dagli anni. (90)⁷⁰

Once again, we have a fusion of physics (the quantum; the atomic “valenza”), psychology (greed and narcissism), and genetics. In this passage, as Frasca has noted (2011, 117-25), the entanglement between libido and greed, i.e. egoism and egotism, is made clear. As should be expected, discontinuity in one runs parallel to the other. In fact, the gems given away with the bride physically represent the family's perpetual status (despite their coming from war profiting), as they are “incubate e nate nei millenni originari del mondo” (232).⁷¹ Their very atomic structure results from a long and seemingly ordered natural process. However, once more, chance takes the upper hand, as the Valdarenas' most prized gem, a blue opal, is substituted by Liliana with a red diaspre, on account that it seems to have caused cancer to uncle Peppe (recall the equation of chance and superstition): “Potente emanazione dello scarognato biossido!” (109).⁷² Liliana, who should have borne the family's heir, gives instead the diaspre as a present to her cousin Giuliano.

I will return to Liliana's death at the end of this chapter. Suffice to note here that, instead of a *genetic* sentiment providing the shortest route towards happiness, we have found a series of disconnected encounters driven by libido, flashing possibilities into reality without any apparent order, or rather with sudden deviations from the expected. A defiance to any determinism, cause-effect relation, or linear flux.

⁷⁰ “They want it back, they want once more the flower! with its broken stem, the quantum that has been lost from their life. Like filings on the magnet, the tiniest fibers of their viscera are polarized on the *tension of return*. They feel they must suck back the gamic unit that has been expelled, the biological unit . . . They would like to control again the possibility, the nuptial valency offered to another, to the husband . . . And the gamic unit whose possession they claim implies, at the same time, an economic quantum. She was a splendid girl, and there was a coffer of jewels: former and latter ripened by the years” (Gadda 2007, 115).

⁷¹ “[I]ncubated and born in the originative millennia of the world” (Gadda 2007, 323).

⁷² “O powerful emanation of the doubly ill-starred bioxide!” (Gadda 2007, 144).

Erotic Indeterminacy and Half-dead Chickens

After focusing on the relation between chance and discontinuity, we now look closer at erotic indeterminacy within the storyworld, and its disruptive effects on the cause-effect chain: far from being exclusive of the suspended finale, indeterminacy is constant throughout the story. Ines' interrogations are a good example. Hidden behind the filth and smell of her miserable condition, her dazzling beauty is still affecting the men around her, prompting the metaphorical link to a Bohrian atom, with electronic levels hiding the nucleus. Instead of studying it, the policemen react with ill-concealed frenzy: "Superfici imitative del volume vero e nucleale parevano ripetutamente avvolgerla, come circoli il sasso gittato ad acqua, amplificavano al «pensiero degli astanti» cioè al maschile delirare quel suggerimento stupendo" (RR 2:147).⁷³ Libido's influence is the only constant, leading everyone astray: as correctly interpreted by Frasca, the police reveal their deeper urges behind justice's pretension: "[Q]uegli uomini, la ricattavano col solo sguardo . . . di una cupidità ripugnante" (170).⁷⁴ At the same time, she is prey to her love for Diomede, despite his inhumanity, and defends him until the jealousy for his gigoloing allows for some truth after "la settantatreesima bugia" (165).⁷⁵ Ingravallo too is not completely self-possessed, rotting with resentment for Diomede's good looks. When, eventually, he arrives at Assunta's door (a visit that, to be clear, he was planning since days before Ines' interrogation), it is probably Diomede who he is considering as her possible boyfriend, before remaining paralysed with doubt in front of Assunta's *excusatio non petita*.

Indeed, Ingravallo's inferiority complex is not an isolated case. Our protagonist is constantly driven by his libido. Being "[u]n Apollo non più ventenne, un tantino pelosetto" (260)⁷⁶ in a society

⁷³ "Surfaces imitating the true, nuclear volume seemed to enfold her repeatedly, like circles surround the stone cast in the water, amplifying 'in the minds of the witnesses,' that is in male delirium that stupendous suggestion" (Gadda 2007, 199).

⁷⁴ "[T]hose men, blackmailed her with their gaze alone . . . of a repugnant greed" (Gadda 2007, 233-34).

⁷⁵ "[H]er seventy-third lie" (Gadda 2007, 227).

⁷⁶ "An Apollo no longer twenty, a tiny bit hairy" (Gadda 2007, 364).

where masculine beauty is a fundamental value (while fascist discourse carefully hides its homosexual reverberations), his attraction towards beautiful women is only comparable to his irrational hate for good-looking men. His quest for Liliana's assassin takes the form of a personal revenge for a loved one, and he arrests Giuliano Valdarena, who was present at the crime scene, before even having a warrant (67). Although illegal in principle, the arrest would still seem to come from reflection, if it weren't for the jealousy he felt since their first meeting.⁷⁷ Indeed, Giuliano Valdarena's case is similar to Ines': Ingravallo has to determine his position between 9.20 and 10.35, when Giuliano found Liliana's corpse and called for help. The only one who could place him on via Merulana's stairs before 10.35 (giving him an alibi at the time of the murder) is a little girl, who first denies, then confirms due to her mother's infatuation for him: "Di', di' la verità, cocca mia: dimme un po', sì, sì è che l'hai visto, er signorino qua, su le scale, vedi com'è bionno? che pare un angelo?" (92).⁷⁸ Is his position real, or has he been misplaced by the neighbour's fascination? Eventually, it is proven that Liliana had given him jewels and money as presents in the hope of having his future child. Indeed, she saw him as a candidate father, and, following Amigoni (1995, 82-86), Ingravallo (who is knowledgeable in psychology) has to surrender to the Freudian unconscious identification between gift, child, and phallus. This signs the policeman's defeat, despite the jewels having been donated two months before the murder, a reasonably long time that does not necessarily exonerate him from guilt.

⁷⁷ Don Ciccio is prey to "un'astiosa gelosia verso i giovani, specie i bei giovani" ("a kind of prickly jealousy towards the young, especially towards handsome young men." *RR* 2:25; Gadda 2007, 17-18), as the narrator explains. To give few samples of the phenomenon: Remo Balducci, Liliana's lady-killer husband, is classified by Ciccio as "il caprone" ("the old goat." *RR* 2:18; Gadda 2007, 7); as soon as he meets Giuliano, he has the certainty that he "corteggiasse la signora Liliana per... ma sì!... per averne favori di denaro" ("was paying court to the Signora Liliana in order to... yes, of course!... to win financial favors from her." *RR* 2:26; Gadda 2007, 19); Diomede's photograph elicits in him "una certa stizza segreta" ("a certain secret annoyance." *RR* 2:168; Gadda 2007, 231). On the other hand, his misogynistic tirade against female psyche and cult of personality is done in "una maniera di prestatuito delirio" ("a kind of pre-established delirium." *RR* 2:105; Gadda 2007, 138); and he accepts almost instantly as harmless another suspect, the gourmand Commendatore Angeloni (in fact Gadda's fictional alter ego), who lives alone and whom he suspects (justly) of homosexuality.

⁷⁸ "Tell the nice man, dear, tell the truth. [Of course, of course you saw] this gentleman here, on the steps? See how blonde he is? Like an angel, isn't he?" (Gadda 2007, 118).

Once Giuliano's erotic control over Liliana is confirmed, his alibi (his position) is left to its indeterminacy.⁷⁹ Indeed, when Ingravallo's voice, mixed with the narrator's, defines himself "misero e pertinace indagatore dei fatti, o delle anime, secondo la legge" (65-66),⁸⁰ we should take the disjunctive clause's exclusive sense seriously: facts and souls (i.e. psyches, Freudian *Seelen*) are equivalent to non-commuting operators. Unable to investigate souls without being prey to his own libido, Ingravallo eventually finds himself crazy with fury and doubt in the face of Assunta's "fede imperterrita negli enunciati di sue carni" (276).⁸¹

Clearly, then, those who master libido control human destiny, at least within uncertainty's limits. It is Zamira's case, who, not coincidentally, works (also) as a clairvoyant. Her secret is her ability to understand and direct human desire, so as to "inculcare, dietro onesto compenso, un quanto cioè un tanto d'energia cinetica a' dubbiosi, a' malsicuri: confortarli al pragma, corroborarli all'azione"

⁷⁹ Another uncertainty of position, presented in a more comical manner, regards the theft of Menegazzi's jewels. Ingravallo is informed by various testimonies that, when the thief fled, there was on the street a butcher's boy: both were seen running. The question is whether the boy was an accomplice or someone who, being there for other reasons, tried to catch the thief. The position of the boy with respect to the thief is in this sense determining: if the boy ran before the thief, he was probably an accomplice; if he ran after him, he might have been trying to apprehend him. Obviously, both the possibilities are given as the truth: Manuela Pettacchioni, the porter, says that he was behind the thief, while Prof. Bertola, female schoolteacher, says he came before. (34-36). Here, too, the butcher's boy is a beautiful "serafino" ("seraph"; *RR* 2:36; Gadda 2007, 33), as the two women refer, so that their observations, compromised by a quantum of eros, seem to have displaced his position. The analogy with the observation of a subatomic particle is confirmed later on. It is understood that the butcher's boy was probably making a deliver for Angeloni (Gadda's alter ego): called to the police station along with Pettacchioni and Bertola, Angeloni stays defensive (the reader can guess that he is worried of being labelled homosexual), yet eventually gives the address of his usual butcher: via Panisperna. However, the butcher boy brought in by a policeman turns out to be the wrong one (45-47). As with subatomic particles, the butcher boy cannot be individualised and followed in his tracks, but is lost in the myriad of the others. The fundamental hint to allow the interpretation is via Panisperna, as it was the seat of the Royal Institute of Physics where, since 1926, Enrico Fermi (one of the main Italian voices for quantum physics) had the first chair of theoretical physics in the whole state, working with other physicists soon known as "i ragazzi di via Panisperna" ("the boys of via Panisperna"). On the topic, see Colangelo and Temporelli (2013).

⁸⁰ "[A] humble and dogged investigator of events, or of souls, in the law's name" (Gadda 2007, 78). The syntagm investigator of souls recalls the German term *Seelensucher* used to indicate the psychologist. See Amigoni (1995, 75).

⁸¹ "[U]ndaunted faith in the expressions of her flesh" (Gadda 2007, 388).

(148).⁸² The result is that, to everyone, her laboratory is a place “da non si poter incontrare il più opportuno a distillarvi una goccia, una goccia sola e splendida della eternamente proibita o eternamente inverisimile Probabilità” (151).⁸³ A probability susceptible to desire which, controlled on the one hand through predictions and filters (sustaining their buyer’s erotic ambitions), is manipulated on the other with the more readily means of prostitution. Zamira’s laboratory makes for an apparatus preparing the system of possibilities surrounding those who pass through it to collapse in the worst possible ways. Although nothing points to Zamira being behind either the theft or the assassination, the main suspects are all connected to it. Not only is Diomede (a suitable choice for the murderer) Zamira’s ex-collaborator, but Ines also meets the suspect “zingara” through a friend (Camilla Mattonari) who works for her.

As we learned from Ingravallo, fate, too, as the world’s wave function, has an influenceable soul: it reacts to the system of all polarities, a vectorial sum of human (and non-human) desire. Once sentiment, i.e., the direction-giver, is substituted by libido, and the latter acts at a quantic level, there is no safety from irrationality. As maintained by Lubomír Doležel, in a storyworld “[t]he concept of free agent makes sense only within [the mode of rational acting]: the person has control over his or her acting if his or her reason (ratio) is in control” (1998, 71). Given the premises, no fully free agent can be accounted for in the *Pasticciaccio*, since libido becomes the unpredictable guide of a world thrown into chaos. To keep up with Doležel’s terminology, the *Pasticciaccio*’s is a storyworld in which a weakening of the alethic system (true/false/possible) leads to a *debacle* of the axiological (good/evil/neutral), within a dictatorship which has already perverted the deontic (compulsory/prohibited/allowed). In such a situation, the best way to investigate becomes embracing contingency through “estremo religioso empirismo” (*SVP* 724), since the datum is always external,

⁸² “[T]o inculcate, at a reasonable fee, a certain quantum – that is to say the necessary amount – of kinetic energy to the dubious, to the insecure: comfort them in the pragma, corroborate them in the act[ion] itself” (Gadda 2007, 202).

⁸³ “[W]hose like you would never find, still less its better, for distilling a drop, a single and splendid drop of the eternally prohibited or eternally unlikely Probability” (Gadda 2007, 206).

and thus unexpected.⁸⁴ This is why, to come back to the question whether “*datur casus*,” it is “la rete un tantinello sfilacciatella del pattuglione” which brings in the results: the net being metaphorically equivalent not of an active search, but of an availability to receive, like a screen in which particles leave their traces. The same goes for Gaudenzio Deviti, aka er Biondone, Ingravallo’s subordinate, who, in his search for Ascanio in the chaotic market, succeeds thanks to “la di lui tecnica ciondolona e distratta (a dargli retta), bighellante, smicciante a caso . . . e la fortunata sagacia del perdigiorno urbano che si lascia guidare dal tacere d’ogni ipotesi e d’ogni disgiunzione, come la sonnambula su la grondaia” (*RR* 2:252).⁸⁵ That is, provided we accept that every theory will fail at some point, “come una rete che si smaglia” (248).⁸⁶

After all, the event, the unexpected datum, has a double value for Gadda. On the one hand, it is the material resistance thwarting the idealistic pretence of perfectly knowing, or perfectly controlling, reality: we have seen this in *L’Adalgisa*. On the other, its value as a thing in itself is almost null: it only matters in light of what prepared it and on the systems with which it is tangled. As Gadda wrote in “Un’opinione sul neorealismo” (“An Opinion on Neorealism”; 1950), “il fatto in sé, l’oggetto in sé, non è che il morto corpo della realtà, il residuo fecale della storia” (*SGF* 1:630).⁸⁷ The same, if we want, can be said for Liliana’s cadaver: it matters for sparking the novel’s entire history, and for being watched by Ingravallo (and the narrator). It tells us more about the latter than about itself. Yet, the datum is, in a quantic fashion, the result of the wave function’s collapse, the singularity coming out of destiny’s preparations, unexpected until clear-cut. Moreover, once realised, the datum sets back all its non-commuting variables to indeterminacy: a gain of knowledge for a loss of knowledge. We are

⁸⁴ An “extreme religious empiricism.” This is the same point of the *Meditazione milanese* where Gadda arrived at his “fatalismo sì, ma alla rovescia” (see ch. 1.4, 106). The collapse of sentiment as a theoretical concept ends up invalidating that part of the theory.

⁸⁵ “[H]is dandling and absent-minded (to hear him) technique, loafing, peering at random . . . and the lucky wisdom of the urban idler who allows himself to be guided by the silence of every hypothesis and of every disjunction, like the sleep-walker on the rainpipe” (Gadda 2007, 352).

⁸⁶ “[L]ike a net that is unraveling” (Gadda 2007, 348).

⁸⁷ “The fact in itself, the object in itself, is nothing but reality’s dead body, history’s faecal residue.”

at Zamira's, and Pestalozzi is trying to force her to reveal the location of Camilla Mattonari, who seems to be in cahoots with Enea Retalli:

In quel punto, come evocata di tenebra, dall'uscio socchiuso della scaluccia approdante in bottega . . . si affacciò, e poi zampettò sul mattonato freddo qua e là con certi suoi chè chè chè chè tra due cumuli di maglie, una torva e a metà spennata gallina, priva di un occhio, e legato alla zampa destra uno spago, tutto nodi e giunte, che non la smetteva più di venir fuori, di venir su: tale, dall'oceano, la sàgola interminata dello scandaglio . . . Dopo aver esperito in qua in là più d'una levata di zampa, con l'aria, ogni volta, di saper bene ove intendeva andare, ma d'esserne impedita dai divieti contrastanti del fato, la zampettante guercia mutò poi parere del tutto . . . A strozza invelenita principiò a gorgheggiare in falsetto: starnazzò spiritata in colmo alla montagna di que' cenci, donde irrorò le cose e le parvenze universe del supremo coccodè, quasi avesse fatto l'ovo lassù. Ma ne svolacchiò giù senza por tempo in mezzo, atterrando sui mattoni con nuovi acuti parossistici, un volo a vela de' più riusciti, un record: sempre tirandosi dietro lo spago. Parallelamente allo spago e alla infilata dei nodi e dei groppi, un filo di lana grigio le si era appreso a una gamba: e il filo pareva questa volta smagliarsi da reobarbara ciarpa, di sotto al ridipinto ciarpame. Una volta a terra, e dopo un ulteriore co co co co non si capì bene se di corruccio immedicabile o di raggiunta pace, d'amistà, la si piazzò a gambe ferme davanti le scarpe dell'allibito brigadiere . . . e plof! la fece subito la cacca: in dispregio no, è probabile anzi in onore, data l'etichetta gallinacea, del bravo sottufficiale, e con la più gran disinvoltura del mondo . . . (RR 2:205-6)⁸⁸

⁸⁸ "At that point, as if summoned from the darkness, from the slightly opened door of the little stairway which led into the store . . . there peered in, then hopped onto the chill tile floor, here and there, with certain cluck-clucks of hers, among two piles of sweaters, a surly and half-featherless hen, lacking one eye, with her right leg bound by a string, all knots and splices, which wouldn't stop coming out, coming up: such, as from the ocean, the endless line of the sounding . . . After having hazarded, this way and that, more than one lifting of the foot, with the air, each time, of knowing quite well where she meant to go, but of being hindered by the contradictory prohibitions of fate, the pattering one-eyed fowl then changed her mind completely. She unstuck her wings from her body (and she seemed to expose the ribs for a more generous intake of air), while a badly restrained anger already gurgled in the gullet: a catarrhous commination. Her windpipe envenomed, she began a cadenza in falsetto: she pecked wildly at the top of that mountain of rags, whence she sprayed the phenomena of the universe with the supreme cockledoodledoo, as if she had laid an egg up there. But she fluttered down without any waste of time, landing on the tiles with renewed paroxysms of high notes, a glide of the most successful sort, a record: still dragging the string after her. Parallel to the string and its chain of knots and gnarls, a thread of gray wool had caught on one leg: and the thread this time seemed to be unwoven from a rhubarb-colored scarf, beneath the dyed rags. Once on the ground, and after yet another cluck-cluck expressing either a wrath beyond cure or restored

Once more, Gadda pours his worldview into what is apparently just a lengthy divagation. Representing the works of probability, the chicken appears from the basement where Zamira makes her predictions, seemingly half alive and half dead – a courtyard version of Schrödinger’s cat. It moves apparently at random, followed by a rope which, instead of providing a clear direction (a cause-effect line), is tangled up and disappears in the darkness below, eventually *doubled* with a second thread out of a chaotic bundle of clothes. Interestingly, the rope is described through a parody of Manzoni’s celebrated inceptive description of river Adda’s course in *I promessi sposi* (“*The Betrothed*”; 1840-42). That aerial description is substituted with one hinting at the oceanic depths, as a novel hinging on the faith in God’s providence is fed to a scene of total randomness and undecidability (note the constant superposition of the chicken’s possible states). The event, whose expectation Gadda grooms for an entire page, is nothing but an excrement: worthless in itself, indeed, but sufficient to distract Pestalozzi and make him lose his train of thought. The wave function is now collapsed, and only Lavinia’s arrival with Menegazzi’s topaz ring eventually saves the brigadier, bringing the story back to its tracks.

Amigoni saw in this scene nothing but a suspense mechanism (1995, 60). In retrospective, his analysis of the *Pasticciaccio* through Freud’s psychoanalysis proceeds on the same railroad as the detective story *à la* Conan Doyle. In a classical interpretation, Catherine Belsey had defined the role of Sherlock Holmes “to make everything explicit, accountable, subject to scientific analysis” (1989, 111), in the positivistic spirit of the time.⁸⁹ In a sense, Ingravallo’s use of psychoanalysis to solve the crime would point to an updated version of the genre, simply keeping the pace with the latest scientific

peace and friendship, she planted herself on steady legs before the shoes of the horrified corporal . . . and, plop, promptly took a shit: not out of contempt, no, probably indeed to honor, following hennish etiquette, the brave noncom, and with all the nonchalance in the world . . .” (Gadda 2007, 284-86).

⁸⁹ We can certainly correct this affirmation with Joseph Agassi’s (1982) idea that the unsolvable ambivalence between DIY scientific method and the romantic genius of the detective is what keeps the genre alive, but the point still stands.

trends and offering a ready-made key for interpretation. This, however, would close the system. Commixing Freud with quantum physics, instead, allows for a science that has impossible closure ingrained in its very methodology.

Quantum Ethics

We have seen how the *Pasticciaccio*'s storyworld, taking its N-force from quantum theories, is given a new set of logical rules to interpret its reality. What are the ethical consequences of this change? Already defined are the effects of discontinuity on the fascist and religious cult of linearity/teleology of race, family, and social status. Yet, the matter runs deeper, and is connected to the repercussions of knowing on reality. Since I have been following the line of Bohrian indeterminacy, it seems fair to make a comparison between Gadda and the recent Bohr-inspired ethics developed by Karen Barad's "agential realism." Although Bohr relates indeterminacy mainly to epistemological issues, Barad's study implies that the theory had, even for him, important ontological consequences for the observed object's actuality. If we are to take this seriously, object and apparatus are to be considered distinct entities only within their configuration in the phenomenon. It follows that "apparatuses are specific material reconfigurings of the world that do not merely emerge in time but iteratively reconfigure spacetime as part of the ongoing dynamism of becoming" (2007, 142). If, moreover (to extremely summarise Barad's claims), we extend quantum mechanics outside the laboratory, apparatuses end up including human (and non-human) entities. "Hence, – Barad writes – in contrast to the spectator theory of knowledge, what is at issue is not knowledge *of* the world from above or outside, but *knowing as part of being*" (2007, 341): knowledge itself is not an ideal mental action, but a practice of engagement with actual effects on both the knower and the known.

This idea seems to go hand in hand with Gadda's own philosophy and literature. In *Eros e Priapo*, Gadda denounced the consequences of uncontrolled impulses and illusions over society; in *L'Adalgisa*, similarly, he showed how mental schemes led to the actual deformation of reality. While

the latter works can be taken as reflecting on cause-effect relations, the *Pasticciaccio* developed Gadda's strongest repudiation of simple entities: indeterminacy and entanglement are actuality in the storyworld. However, the kind of knowledge at work in Gadda's detective story is fundamentally different from his preferred heuristic research. It is a means of reparation for a reality thwarted by homicide, a stitch applied to its tissue, severed like Liliana's throat. Such reparation, fundamentally, we do not see completed. It is common, indeed, as implicit or explicit corollary, to surmise that eventually guilt is diffused on everyone and everything (including the investigator and, possibly, the reader).⁹⁰ Although this statement is undeniable, it threatens to simplify the spirit of the issue. We have, instead, to come back to knowing as deforming, an *act* of polarisation which does not cause a reaction but establishes a link, a mutual conditioning in the spirit of quantum complementarity. This withers the very notion of identity, establishing in its stead a fluid quiddity that is constantly renovated in a mode of *knowing as acting upon*, and ends up incorporating the very narrative instance that constitutes the storyworld's condition of existence.

To press the issue of guilt's diffusion further, we could come back to Gadda's quoted long-standing reflection on the quasi-butterfly effect that every event and every thought has on the world, from the *Meditazione milanese* to the 1953 essay "L'egoista." If we follow Valentino Baldi's interpretation, we are compelled to recognise Gadda's literary universe as inherently paranoid (2019, 27), working with laws that seem to come out of a psychopathological mindset. However, quantum indeterminacy, whether active from the beginning or implemented by Gadda along the years, allows to see the phenomenon in a different light, as it includes the relations that *every* being helps to create as qualities of a more universal (and at least dual) substance. In this sense, the cause-effect chain that

⁹⁰ This is nowadays a kind of textbook interpretation for the novel, corroborated by other works of Gadda. A few examples: apart from Agosti's "indecidibilità assiologica" ("*axiological indeterminacy*"; 2016, 17) between good and evil, Frasca finds in Gadda the "intento . . . di disseminare su tutti la colpa della punizione inflitta al *dissoluto*" ("the intention . . . of diffusing on everyone the guilt of the punishment inflicted to the *dissoluted*"; 2011, 116) the latter being whoever strides from the pact of normality (including Liliana and Angeloni); to Donnarumma, Virginia and Assunta are "figure di una implicazione tra innocenza e colpa" ("figures of an implication between innocence and guilt"; 2006, 74); to Godioli "guilt in the novel manifests itself as a common burden" (2015, 698).

leads from the dragonfly to me (in the example of “L’egoista”) actually stems from its acausal polarisation, i.e., from the deformation brought to the total system. In addition to this, guilt itself, once complicated by the quantum of eros, comes in a different shade, colliding with the necessary lack of a completely free agency. Although this does not seem to cancel guilt altogether, it has to be taken into account.

In the end, thus, what are we (as quasi-agents) responsible for? Barad’s agential realism answers by putting our responsibility in the cut that we enact *within* the phenomena (in the Bohrian sense), i.e., in where we make the apparatus end and the object begin from within the more fundamental entanglement that constitutes reality, thus allowing the resulting knowledge to be objective. Our “intra-actions,” as she terms such cuts, “do not simply transmit a vector of influence among separate events. It is through specific intra-actions that a causal structure is enacted” (2007, 393). Indeed, Barad includes space, time, and matter as configurations that are modified by intra-action. Although not as extreme, Gadda’s ethical stance refuses both dogmatism and simple relativism. He states in the *Meditazione milanese* that “virtù esprime un rapporto, variabile a seconda dei casi. Ed è una funzione derivata d’un sistema di rapporti detto realtà” (*SVP* 684).⁹¹ Viz., it is within systemic interconnection that right and wrong are rediscussed. Such ensemble includes fact *and* opinion, treating knowledge as a relation-establishing action which continuously changes the ethical equilibrium.

Yet – here is the kicker – Gadda’s knowledge is never innocent: as an act, it expands one’s relations on one hand while it severs them on the other. The cut required to distinguish, within the phenomenon, the apparatus from the object (Barad’s intra-action), is to Gadda an *actual* cut, inevitable damage inflicted by the new polarity. As Bertoni has concluded from the analysis of Gadda’s narrative transgressed bodies “[i]l corpo aperto, violato, indagato nei suoi recessi segreti, diventa . . . l’emblema di un metodo conoscitivo di secondo grado che lo stesso Gadda applica, come

⁹¹ “[V]irtue expresses a relationship, variable from case to case. And it is a derivative function of a system of relationships called reality.” Regarding the ethical reflections in the *Racconto italiano*, see *SVP* 407 ff.

un chirurgo, sul corpo visibile della realtà” (2001, 37).⁹² Recall, on the same line, the duel-centred analogy used to describe polarity in *Come lavoro*, hinting that the cut could very well make an object of *the knower*, instead of the known entity. All knowledge, all action (no difference anymore between the two) one way or another, is an outrage to the object, and as such is irreparable: “Poiché ogni oltraggio è morte” (*RR* 1:598).⁹³ The act of reparation, constituting the basic narrative leitmotiv of detective stories, cannot but bring additional destruction, subjecting the outraged Liliana to the further polarisations brought about by libido. Killed first as a mother by a society that wants her faithful to an unfaithful husband, then as a living body by sexual and economical drives, Liliana finally dies as an independent human being in Ingravallo’s idealised self-delusions, reduced to a shadow forced to eternal suffering: “Liliana gli sembrò rivolgersi disperatamente chiamandolo, dal suo mare d’ombra: con lo stanco volto sbiancato, l’occhio dilatato nel terrore, fermo, per sempre, sui baleni atroci del coltello” (*RR* 2:271).⁹⁴ All these relations are imposed. Not by chance, Ingravallo suspects in her

la psicosi tipica delle insoddisfatte, o delle *umiliate* nell’anima: quasi, proprio, una dissociazione di natura panica, una tendenza al *caos*: cioè una brama di riprincipiar da capo: *dal primo possibile*: un «rientro nell’indistinto». In quanto l’indistinto soltanto, l’Abisso, o Tenebra, può ridischiudere alla catena delle determinazioni una nuova ascisi. (105-6; my emphasis)⁹⁵

⁹² “The body as open, violated, investigated in its secret recesses, becomes . . . the emblem of a cognitive method to the second power that Gadda himself applies, like a surgeon, to the visible body of reality.”

⁹³ “Because every outrage is death.” By the way, when confronted with the problem of organisms (and their free will), even Bohr implied that making the cut could mean deciding between life and death. He proposed to regard the physico-chemical properties of inanimate bodies and the biological properties of living beings as complementary, as the experimental arrangements to study single atomic behaviours “will exclude the possibility of maintaining the organism alive” ([1937] 1999, 61). Among other times, he expressed this view in 1937, at a conference in Bologna for the bicentenary of Galvani’s birth. The talk was published in Italy in 1938 both in the conference proceedings and in the journal *Nuovo cimento* (“*New Enterprise*”). See Bohr ([1937] 1999, 50).

⁹⁴ “Liliana seemed to address herself, calling to him desperately, from her sea of shadows: with her weary, whitened face, her eye dilated in terror, still, forever, on the atrocious flashes of the knife” (Gadda 2007, 381).

⁹⁵ “[T]he typical psychosis of the frustrated woman, the discontent, the woman *humiliated* in her soul: almost, indeed, a disassociation of a panic nature, a tendency to *chaos*: that is, a longing to begin all over again from the beginning:

Such feeling, as in Menegazzi's case, influenced destiny's field of force. Already in 1927 (the year of our setting) Gadda similarly described suicidal drive in the essay "I viaggi, la morte": "Filosoficamente questo anelito verso il caos adirezionale rappresenta un regresso alla potenza primigenia dell'inizio, ancora privo di determinazioni etiche" (*SGF* 1:581).⁹⁶ Ethics is linked once again to polarised possibility, and (as we saw in Valéry) self-imposed death is the only way to go back to a previous condition: the virtual state of the wave function before the collapse, before being enslaved by the chain of determination. However, the investigation keeps Liliana's identity bound to the world and its spiderweb of libido.

We have seen how Gadda conceived of gender through his notion of polarity, his idea of human beings being potentially both male and female, and the role that the concept had in rendering gender categories fluidly variable in the subject/object relations (see ch. 1.4, 116 ff.). *Quer pasticciaccio* is not an exception, in this sense. Examining the issue and identifying pictorial and Dantean echoes in the novel, Manuela Marchesini has argued that Ingravallo's quasi-repentance in front of Assunta (for her undoubtedly the culprit) is an epiphanic celebration of "omnipotentiality": "Don Ciccio si rispecchia e si autocomprende in Assunta Crocchiapani condividendone tutto, responsabilità o colpa d'omicida traditrice, ma anche innocenza d'umiliata e offesa dalla nevrosi di Liliana, felicità d'essere donna e d'essere uomo, carnale Lucifero e tizianesca occhi di pupa Madonna" (2014, 97-98).⁹⁷ Indeed, that of gender is the *Pasticciaccio*'s most explicit polarity. However, seen through the lens of a quantum logic, the mutual implications of male and female are part of a more universal worldview. Correcting the aim of Marchesini, and refuting the certainty of Assunta's guilt, I would argue that

from the first Possible: 'a return to the Indistinct.' Since only the Indistinct, the Abyss, the Outer Darkness, can reopen a new spiritual ascent for the chain of determining causes" (Gadda 2007, 138-39; my emphasis).

⁹⁶ "Philosophically this aspiration to directionless chaos represents a regression to the primigenial potency of the beginning, still devoid of ethical determinations."

⁹⁷ "Don Ciccio is reflected and understands himself in Assunta Crocchiapani sharing her everything, the responsibility or guilt of homicidal traitor, but also the innocence of humiliated and offended by Liliana's neurosis, the happiness to be woman and to be man, carnal Lucifer and Titianesque doll-eyed Madonna."

what Ciccio is experiencing, in the end, is not simply a self-reflection. Caught in the superposition of Assunta's innocence and guilt, and in the yet indeterminate polarity between him and her, between object and apparatus, Ingravallo and Assunta are one entangled system, one phenomenon. Gadda decides to leave us suspended, before the cut's enactment, while the detective is still uncertain whether he is going to be the triumphing subject, or the defeated object. Through this open chasm, the storyworld collapses onto the actual world, calling forth the response of our own agencies: whatever choice we, as readers, make, will be our responsibility.

Conclusion

My research started from a series of general considerations, developed in Section 1, on the mechanisms, mainly metaphorical and analogical, through which physics was integrated in the literary work of Paul Valéry, Virginia Woolf, and Carlo Emilio Gadda, each in their own personal way. I managed, thus, to look at texts that developed in a longer span of years, or that represented steps in a protracted reflection (as in Gadda's case). From there, I moved on to develop, in Section 2 and 3, a series of analyses based on close reading, framing the latter through the problems and formalisations proposed by physical theories. These were either seen in direct relation to the texts, or more broadly highlighted parallel ways of exploring and representing similar issues.

Having each framework tailored for the exploration of specific texts allowed me to aim for a detailed study of the ways in which literary imagination participated, in early 20th century, in a wider cultural inquiry into the nature of the world and of the possibilities of human knowledge within it. In particular, when focusing on the thought-experimental character of the texts, I shaped the experience of reading as if taking imaginative "walks" in what Umberto Eco once called the "fictional woods" (1998). I looked at the simulated environment offered by the narratives and tried to find, with the help of the various paradigms, the meaning and role of its particulars within the complexity of their fictional world. At the same time, the fact that frameworks coming from the same theory inevitably led to address similar problems in similar ways fuelled the comparative side of my research, emphasising how authors that are at first sight quite different from each other were actually taking variously interconnected roads. In this light, their different solutions (even when tentative and open)

can also be reappreciated in their specificity, as autonomous parts of a larger European literary theorisation.

This, I would say, justifies my research, but I would conclude with some wider considerations, to precise some of the questions that were proposed in the introduction. In the first place, my work shows that all the three authors (and, possibly, literary modernism in a broad sense) participated in a sort of ontological impasse that, in physics, began exactly in those years, and is still active: the opposition of continuity and discontinuity. As we have seen, relativity proposed (in fact required) a model of the world as a *continuum*, whereas quantum physics utterly refused that position. From this followed a series of theoretical debates, especially between Einstein and Bohr, of which we have seen a part. While special relativity could be given a quantic interpretation, a quantum adaptation of general relativity is yet to be seen. Physicists were thus forced to work with theoretical tools that could not, in principle, offer a coherent world-view, yet were still able to do so in practice thanks to the differences in the scale of their issues, allowing to ignore, in most cases, one or the other point. Poincaré anticipated this predicament in conventionalist terms in 1902, discussing the coming and going of opposing theories in the history of physics:

When a physicist finds a contradiction between two theories that are equally dear to him, he sometimes says: "Let us not be troubled, but let us hold fast to the two ends of the chain, lest we lose the intermediate links." This argument of the embarrassed theologian would be ridiculous if we were to attribute to physical theories the interpretation given them by the man of the world. In case of contradiction one of them at least should be considered false. But this is no longer the case if we only seek in them what should be sought. It is quite possible that they both express true relations, and that the contradictions only exists in the images we have formed to ourselves of reality. ([1902] 2010, 163).

This does not mean that the question is always ignored, and indeed the idea of a theory of everything has not died with Einstein.¹ Nonetheless, physics has historically maintained a certain metaphysical elasticity when posing its own questions. As can be seen from a comparison between section 2 and 3, and confirming the intuition stated in the introduction (8), that same elasticity regarding the same problem (continuity vs. discontinuity) can be assigned to the works by our authors. On the one hand stands the possibility of a complete system, in which any point can be reached from any point without disturbance; this possibility is grounded on an emphasis on the symmetrical features between the observer and the observed, and their mutual interaction yet still possible separation. Of this we have seen examples in all the three authors: the mind-body-world symmetry of Eupalinos; the vision still achievable (yet, importantly, not clearly shown to us readers) by Lily Briscoe; and the Gaddian multidimensional connection between all beings through the invariances generated in the field of reality. On the other hand, there are the jump, the reorganisation at every instance, the disturbance generated by simple existence, the range of possibilities looming over each split of a second, all valid yet all vacuous, and the subject's implication in the object. Again, various instances can be named: the virtual world of Faust's harmonics; the history-defining fictions of pre-war England; or Ingravallo's suspended choice between guilt and innocence. Indeed, the passage from continuity to discontinuity seems to be a matter of degree, with the former being on the strong side (never absolute, however) in those works that came earlier. Yet, as the texts by Gadda show, that same ambiguity can still be present and active in later works, like *L'Adalgisa*,² which fights any assumption of a completely known system while proposing general invariants. It can be maintained in a weakened form even later – think of the line of blood relations (paralleled by the regular structure of crystals), continuous yet always at risk of being subverted in *Quer Pasticciaccio*.

¹ Apart from quantum field theory joining special relativity, classical fields, and quantum mechanics, an example are the various grand unified theories (GUT) that have been proposed since the 1970s: see Crease and Mann (1996).

² And here we should remember how the notes, written around 1942-43 (ch. 2.3, 199), contribute to the continuity paradigm.

Indeed, continuity and discontinuity can produce similar world-views, both based on a general interconnection between beings. Italo Calvino, for example, explained in such a way the discontinuous, Epicurean, and atomistic world of Lucretius' *De Rerum Natura*, and the continuous, Pythagorean, and ever-morphing world of Ovid's *Metamorphoses*, both showing that "everything can be transformed into something else, and knowledge of the world means dissolving the solidity of the world" (1988, 9). Yet, similar solutions can hide quite different underlying mechanisms, completely changing the nature of the reality they portray; and if it is quite normal that two contemporaries would present opposite views, it is indeed another matter when we find one single author doing so, and in many parallel cases. It is tempting to justify this ontological indecisiveness by attributing a kind of rite-of-passage state to modernism. On such a view, modernist works would by definition be torn between the old assurances of the 19th century and the new uncertainties of the 20th. An argument of this kind would require applying the double framework of continuity/discontinuity in the analysis of works by other modernist authors, to see how far it may be taken and how productive it can be for a general hermeneutics of modernism. I would say that, even if such a dynamic played a part, it should be considered in light of a connected phenomenon. Namely, and here we come to the second point, the modernist authors studied in this thesis never ceased to address the problem of reality, even when the very impossibility of a complete answer was installed at the core of their world-visions. This, I would claim, is directly connected with the idea of the possible impossibility (and related incompleteness) of fictional worlds.

While, as stated in the introduction (23), all fictional worlds are formally incomplete if confronted with the possible worlds of logic, the quantum worlds that we have analysed (be them directly or indirectly related to physics) include incompleteness in their ontology in the form of a logical impossibility. In the examples of section 3, this is represented by a kind of superposition between two or more (possibly infinite) choices: each of them would lead to a different result, yet they are left suspended. Importantly, such gaps are thematised and acquire prominence in the world-structure. This predicament directly calls for the choice of the reader (even if, following the textual

suggestions, it can be a choice not to choose), and risks compromising the entire fictional enterprise. To Marie-Laure Ryan (2019, 67-68, and 74-81) this is exactly the case: a world representing logical impossibilities breaks with mimesis and cannot be considered a proper world. Lubomír Doležel recognises the epistemic value of impossibility, yet deprives it of fictional value: an impossible world fails to be authenticated, and representing it “cancels the entire world-making project” (1998, 165). Interestingly enough, when analysing Ronald Sukenick’s 1975 novel *98.6*, which explicitly mentions physics, Doležel recognised that “[f]or a mind storing a Schrödingerian encyclopaedia, logical principles of impossible worlds become comprehensible” (181). Does this redeem such a fictional world from impossibility? I would say so, but he almost certainly would not have agreed. On a related note, Ruth Ronen recognised impossibility as a full-fledged feature of fictional world (1994, 55-57), but distinguished between pre-eminently logical impossibility in postmodernism and natural impossibility in realism and modernism (56). In any case, impossible worlds remain “inauthentic” (57). Inspired by Ronen’s position, Jan Alber, in line with others such as Brian Richardson, has taken a step further, postulating impossibilities as one of the main features of interest for an unnatural narratology. To Alber, “[w]hile many literary texts operate on the basis of real-world cognitive parameters and would thus at least in theory be actualizable, the unnatural radicalizes the fictional through the representation of impossibilities that are nonactualizable” (2016, 32).

At this point one should ask: is the impossibility in literary texts by Valéry, Woolf and Gadda of the same kind of these? The works that were studied in this thesis are not blatantly breaking with logic to expose their medium, in the later style of Robbe-Grillet, for example. They are not exactly the kind of postmodernist playful metalepses that Ronen seems to have in mind (though they come somewhat close at times). And they are not trying to show any kind of unnatural aspect. Apart from the micro-sample of the island of Xiphos, *Mon Faust*, the text that most of all showcases its own fictionality, seems to do so in order to look at how fictionality should interact with the human mind, to present a kind of fiction that becomes aligned with that mind’s actual functioning. And, if we follow my reasoning on virtuality (ch. 3.2, 244 ff.), more than the non-actualisable, what seems to count for

all our authors is the very structure of actualization, its branching out of possibilities, and either the conditions influencing their casual choice or the means of keeping it suspended. In this sense, then, it is Pavel's explanation of literary indeterminacy that we have to follow: "Such thematized, one could say enacted, incompleteness can be construed as a reflection on both the nature of fiction and the nature of the world" (1986, 108). More than being non-authenticated, this thought-experimental, world-analysing kind of fiction is thus over-authenticated: it bleeds into the actual world. The quantum images that I have described, thus, reveal the epistemic value of imagining the unimaginable proposed in the introduction (17 ff) in its highest results. These images are a way of representing those parts of reality that do not accept the clutches of human thought. They are made to invite a reflection about their own features within the fictional world's larger structure, not by domesticating them (as this would hide their nature) but by inserting them within their world's fibres, showing exactly at what point they are instantiated. They are quantic in the true sense of the word: like Planck's quantum of action, so mysterious in its nature yet so precisely calculated, literary quantum images are tentative estimations of those borders of human knowledge beyond which it is impossible to peek.

My third and final remark goes back to literature and science. In the introduction, I have discussed the issues of combining cultural matrix and direct influence, and stressed the importance of conceptual transformation acting from science into literature (esp. 8-11). We are now in the position of precisising these phenomena. In light of the comparative analyses conducted, it should be clear that such a thing as directly taking any theory or information from physics as a discipline, and inserting it into a literary work, has never been the case with these authors, and probably could not ever be in general. Even if we recognise that the preponderant direction in the flow of information is from science to literature, both for the character of the latter and for the specialistic tendency of the former (at least in the 20th century), science never seems to take the role of some truth that literature gratefully receives.

As soon as physics leaves the mathematical formula or the borders of the laboratory, its transformation is already undergoing, so that rather than a two-term comparison between any physical

idea and any literary work, a fruitful comparative hermeneutics requires to take into account a third, larger, and underlying framework. This is society and culture in its entirety, a medium whose irremediably multifarious density reconstructs information in a myriad of forms. In early 20th century, before reaching the literary domain, a physical concept could pass through, and be influenced by, other scientific theories (like the Darwinian), psychological frameworks (be them Freudian, or more unconventional), philosophical outlooks (from Russell, to Whitehead, to previous influences such as Descartes and Leibniz, and proper philosophy of science such as Poincaré's), the press and its (mis)representations, political preoccupations, literary traditions, and so on and so forth. Such concepts might change to the point that the very authors picking up this or that inspiration for their own use need not necessarily know that they came from physics, and yet feel that they speak to their own preoccupations. Physical theories can also be freely redeployed at all possible levels: from objects, to themes, to narrative/discursive voice, to the very structural organisation of a literary work. Even in those situations in which a theory seems taken directly from a scientific paper or a conversation with a physicist (as it sometimes seems the case with Valéry), its character shifts towards a preoccupation with the human that leads to a selective use, that some might call an abuse, of its features. To that, we should add the resonance with personal theories that we have happened upon especially in section 3, and that leads to transformations that work in two directions: on the theory that is adapted, and retrospectively on the ideas on which it is installed.

If isomorphism already justifies a comparison between literature and science, an analysis informed by a study of the cultural matrix, its field of force, and its material paths allows to catch the multiple reverberations of each of its cultural products. Yet, more than as simply helping or preventing certain paths, the cultural medium influencing such field of force should be taken as modifying, at every step of the way, the nature of the information that is being carried, so that the literary authors that receive it (reuse it, retransform it, readapt it) many times are working with an object that is already different from its initial state.

As the medium that is best conscious of the cultural system in which it is embedded, receiving it, conversing with it, and at times revolutionising it, literature reveals itself as a unique object of study. Its consideration allows to understand how it represents the complexity of such a system at all levels, shows the artificiality of its borders with nature, and reveals its hidden dangers and potentialities. In so doing, literature blends the most faithful reconstructions and the freest leaps of imagination.

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Carlo Emilio Gadda's texts are quoted from Garzanti's critical edition, according to the following abbreviations:

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