

## Characters in search of Majorana

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*“The lights of the Mariposa were growing dim in the distance [...]. Then he let himself go and sank without movement, a white statue, into the sea. [...] Down, down, he swam till his arms and leg grew tired and hardly moved. [...] There was a long rumble of sound, and it seemed to him that he was falling down a vast and interminable stairway. And somewhere at the bottom he fell into darkness. That much he knew. He had fallen into darkness. And at the instant he knew, he ceased to know”.*

*(Jack London<sup>1</sup>)*

This is how the journalist Bruno Russo<sup>2</sup> quoting Jack London, describes the last breath of Ettore Majorana, one of the most renowned physicist of the XX century, who mysteriously disappeared the night of March 27th 1938.

Majorana had worked with the team of scientists established in Rome in the 1930s and revolving around Enrico Fermi, and had then boarded the Palermo-Naples ferry boat to head back to Naples, where a few months earlier he had been given for merit the chair of Theoretical Physics.

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<sup>1</sup> *Martin Eden* – Jack London – The Modern Library, 2002

<sup>2</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Flaccovio Editore, Palermo 1997

He never reached his destination. Was it suicide? Some supposed he never boarded that ferry, some assumed he vanished once he was in Naples and others presume he was kidnapped.

Through the years, Majorana's life - and his mysterious disappearance in particular - inspired manifold representations. The wide range of links to science, philosophy and literature have allowed deep reflections crossing the borders of genre: from theatre to fiction, from essays to novels and cartoons.

Reconstructing the character of Majorana by thinking back to all the interpretations he has been given allows us to place him in a wider and more organic context, which goes beyond the functional aspects of fiction. In this wider prospective, we can clearly see why the still unresolved Majorana case has aroused the interest of so many diverse authors.

### **One, no one, and one hundred thousand Majorana**

Celebrated writers such as Leonardo Sciascia, famous scientists like Edoardo Amaldi and Emilio Segrè ("I ragazzi di via Panisperna"), journalists and movie directors like Bruno Russo and many others have devoted themselves to the tragic but in a way exemplary story of Majorana, a character who has gained a remarkable historical weight over time, ascribable only in part to his leading role within the scientific community.

A strong Pirandellian wind blows on all stories on Majorana, which carries along feelings of mystery, poetry, science and war. This wind brought us a unique story, deeply rooted in the darkest vicissitudes of men. Here wanders Majorana continually transformed, through evocative and striking atmospheres, in a multidimensional world consisting of different narrative languages.

A complex spectrum of narrative modes continually transfigures reality. It is the same reality that vanished back in March 1938, and that comes to us today so dense, still so widely transfigured by our languages. No matter whether through essays, novels, tv serials, tales, dramas or even cartoons, our mind is filled with intertwined apparitions and fadings. The figure of Majorana sways amid its manifold representations.

## Plot, language and perspective

The general structure of the numerous representations of Majorana's life and disappearance can be traced by carrying out an analysis on a limited number of interpretative levels.

The first level could be the plot, which allows us to describe the most superficial aspects of a representation. The plot results from the processing of a basic plot containing the intrigue. In each story on Majorana the plot consists of a hypothesis on his disappearance (suicide, flight to Argentina, kidnapping by the US secret service and many more), which is dealt with as a biographical note, i.e. by giving only the dates and places of the presumed events.

On a different level, there are the differences in representation. More or less consciously, authors transfigure the events according to their narrative frame and the potential of their expressive mode.

Then there is the metalevel of perspective, that is the viewpoint of the author, which is usually philosophical or ideological.

### Plot level

Let us now look at each level individually, starting from the plot. The following table<sup>3</sup> shows in short some of the main differences in plot between the interpretations. At least three authors solve the Majorana case relying upon the hypothesis of suicide. Six authors are inclined to believe he disappeared, but their hypotheses diverge greatly.

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<sup>3</sup> The table shows a selection of the most representative authors, with reference to the following works:

- 1) *Ettore Majorana – un giorno di marzo* – Bruno Russo – Flaccovio Editore, Palermo 1997
- 2) *Il caso Majorana* – Erasmo Recami – Di Renzo Editore, Roma 2000
- 3) *La scomparsa di Majorana* – Leonardo Sciascia – Adelphi, Milano 1997
- 4) *La scomparsa di Majorana: un affare di stato?* – Umberto Bartocci – Ed. Andromeda, Bologna 1999
- 5) *La vita e le opere di Ettore Majorana* – biographical note by Edoardo Amaldi – Accademia Nazionale dei Lincei, Roma 1966
- 6) *Autobiografia di un Fisico* – Emilio Segrè – Il Mulino, Bologna 1995
- 7) *I ragazzi di Via Panisperna* – TV movie by Gianni Amelio – 1988
- 8) *Variazioni Majorana* – Play script for the RossoTiziano theatrical company – Napoli 1998
- 9) *Ettore Majorana – un giorno di marzo* – Bruno Russo – Play script for the *La Contrada* company, Trieste, directed by Luisa Crismali – Trieste 1998
- 10) *Il caso Majorana – Martin Mystère* – Album n.191 – Sergio Bonelli Editore, Milano 1998 (text by Castelli, drawings by Rinaldi and Filippucci)
- 11) *Tra le ombre – Lazarus Ledd* – Album n.97 – Star Comics, Roma 2001 (text by Capone, drawings by Gerasi and Del Vecchio)

Leaving aside the unlikely options of kidnapping by aliens and futuristic jumps into the hyperspace (postulated respectively by the cartoon designers Castelli and Capone), we are left with the hypotheses of Sciascia, Recami and the mathematician Bartocci, plus two neutral figures, Amaldi and Segrè, who formulate no hypothesis.

**Tab. 1** *Main differences in plot in the various representations of the epilogue of the Majorana case*

	<i>Main differences in plot in the various representations of the epilogue of the Majorana case</i>
<i>Russo</i>	<i>Suicide</i>
<i>Recami</i>	<i>Disappeared in Argentina</i>
<i>Sciascia</i>	<i>Disappeared in a monastery in southern Italy</i>
<i>Bartocci</i>	<i>Kidnapped by the Nazis or killed by the US secret service</i>
<i>Amaldi</i>	<i>No hypothesis</i>
<i>Segrè</i>	<i>No hypothesis</i>
<i>Amelio</i>	<i>Suicide</i>
<i>Rosso Tiziano</i>	<i>Same as Sciascia</i>
<i>Crismani</i>	<i>Same as Russo</i>
<i>Castelli</i>	<i>Kidnapped by aliens</i>
<i>Capone</i>	<i>Jump into hyperspace</i>

### Differences in perspective

As to the perspective of the representations, the following table shows three approaches. The first one is historical–scientific, typical of essays and traceable in the works of Recami, *Il caso Majorana*<sup>4</sup>, and Amaldi<sup>5</sup>, a biographical note in *La vita e le opere di Ettore Majorana*.

The second approach is ideological, and it can be seen in the work of Sciascia<sup>6</sup> and the literary criticism of Lea Ritter Santini<sup>7</sup>, while the third one is philosophical–existentialist, and it is to be found in the works of Russo<sup>8,9,10</sup>. Within each group, however, some distinctions ought to be made.

<sup>4</sup> *Il caso Majorana* – Erasmo Recami – Di Renzo Editore, Roma 2000

<sup>5</sup> *La vita e le opere di Ettore Majorana* – Biographical note by Edoardo Amaldi, Accademia Nazionale dei Lincei, Roma 1966

<sup>6</sup> *La scomparsa di Majorana* – Leonardo Sciascia – Adelphi, Milano 1997

<sup>7</sup> *Uno strappo nel cielo di carta* – Lea Ritter Santini – in *La scomparsa di Majorana* – Leonardo Sciascia – Adelphi, Milano 1997

<sup>8</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Flaccovio Editore, Palermo 1997

	<i>Differences in perspective</i>
<b>Russo</b>	Philosophical-existentialist analysis, essay structure
<b>Recami</b>	Historical-scientific biographical analysis, focusing on the mysterious quality of Majorana's disappearance
<b>Sciascia</b>	Ideological (and also philosophical-existentialist) analysis, fictional reconstruction
<b>Lea Ritter Santini</b>	Ideological analysis, literary criticism structure
<b>Rosso Tiziano</b>	Analogies with Sciascia, dynamic reconstruction following a timeless and dreamlike evolution
<b>Crismani</b>	Analogies with Russo, considerable amount of literary references
<b>Castelli and Capone</b>	Epic-didactic reconstruction of Majorana's biography
<b>Amelio</b>	Epic-didactic reconstruction of Majorana's biography focusing on the relation with Fermi
<b>Amaldi and Segrè</b>	Historical-scientific biographical analysis
<b>Bartocci</b>	Historical-circumstantial reconstruction

Recami's essay, for instance, though traceable to the historical-scientific approach just like the works of Segrè<sup>11</sup> and Amaldi, carries out a true investigation (accounting for a substantial part of his book) on a presumed flight to Argentina, while the other authors are far from investigating Majorana's disappearance.

While going through the whole life of the Sicilian scientist, both Recami and Amaldi stress the importance of his contribution to physics, though it consists of only ten scientific publications. Both authors provide a detailed historical reconstruction, which leads each of them to a different ending, but neither ever embarks on a deeper analysis of the reasons behind such a paradoxical disappearance.

Amaldi makes a weak attempt at reconstructing the personality of young Majorana, possibly resulting in an over-simplified genius leading a lonely and strange life which was unintelligible to most people. Majorana is looked at with pity to the detriment of his complexity, as if, for some quid pro quo, his genius had to imply an alienation from the world and daily life. It seems like a "Pirandellian escape", misunderstood both from a psychological and a philosophical point of view.

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<sup>9</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – TV documentary broadcasted on December 18th 1990 by Rai Tre Sicilia

<sup>10</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Play script of the *La Contrada* theatrical company, Trieste, directed by Luisa Crismali – Trieste 1998

<sup>11</sup> *Autobiografia di un Fisico* – Emilio Segrè – Il Mulino, Bologna 1995

The same applies to the mathematician Umberto Bartocci and his *La scomparsa di Majorana: un affare di stato?*<sup>12</sup>. In this case there is no attempt at reconstructing the inner conflicts of the physicist, for the theory of kidnapping (by the US secret service or even by the Nazis) discards any deliberate choice such as suicide or a premeditated disappearance. An ineluctable lot, in the shape of an imaginary secret service, acts from the outside and makes the inconvenient reasons leading to a dramatic choice fade.

Russo, who is not a physicist, experiences his own personal journey: he moves from a documentary in 1990<sup>13</sup> to an essay in 1997<sup>14</sup> and a play in 1998<sup>15</sup>, enriching his philosophical view as he moves from one narrative language to another.

### **Majorana: between ethics and science**

The spirit breathing through the story of Majorana is highly ideological both in the fictional reconstruction of Sciascia (*Il caso Majorana*) and in the literary analysis of the critic Lea Ritter Santini (*Uno strappo nel cielo di carta*)<sup>16</sup>.

Though through different narrative modes, both works suggest an indissoluble link between science and history, which has the scientist of the first half of the twentieth century facing controversial ethical issues such as whether to exploit nuclear power and to build the atom bomb.

The disappearance of Majorana (in a monastery in southern Italy) is therefore seen as a deliberate form of rejection of the world, since his genius was ahead of his time and had already sensed that science was about to commit the “sin” (the destruction of Hiroshima). This true attack of Sciascia against the alleged purity of scientific development aroused wide controversy.

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<sup>12</sup> *La scomparsa di Majorana: un affare di stato?* – Umberto Bartocci - Ed. Andromeda, Bologna 1999

<sup>13</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – TV documentary broadcasted on December 18th 1990 by Rai Tre Sicilia

<sup>14</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Flaccovio Editore, Palermo 1997

<sup>15</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Play script of the *La Contrada* theatrical company, Trieste, directed by Luisa Crismali – Trieste 1998

<sup>16</sup> *Uno strappo nel cielo di carta* – Lea Ritter Santini – in *La scomparsa di Majorana* – Leonardo Sciascia – Adelphi, Milano 1997

The argument between Sciascia and Amaldi has become famous. On October 5th 1975 in the magazine L'Espresso the latter replied to Sciascia's articles published in the newspaper La Stampa as follows: "It is fanciful and groundless to believe that the Sicilian physicist could have foreseen the impending danger of atomic weapons for mankind. Back then nobody thought about it yet..." (see the interview with Professor Recami, reported in the box).

This strong link between ethics and science is also to be found in the drama trilogy of the RossoTiziano company, though with variations in register and language (*Variazioni Majorana*, 1998, *Gli Apprendisti Stregoni*, 1999 and *L'America contro Julius Robert Oppenheimer*, 2000). *Variazioni Majorana*<sup>17</sup>, for instance, has a surreal frame and a dreamlike tempo. As the story progresses, different characters follow one another but the same dialogues are cyclically uttered again, with the addition of new and crucial elements. It is like a minimalist crescendo which leads the audience to the final solution of the dilemma.

As Marfella (one of the authors) says, "memories flow one after the other following the dynamics of dreamlike timelessness. It is not a biographic report. It is rather a complex existential journey held up by an often cruel and tragicomic irony, which takes Majorana to the edge of non-return".

The ideological stand of the authors-actors is nevertheless the same as Sciascia's, whose book inspired the whole script.

The structure of the representation of RossoTiziano is completely different from the linear pattern of essays, but at the same time it proves that at the level of perspective common ideological elements can be found.

A little earlier than RossoTiziano, on the occasion of the sixtieth anniversary of Majorana's disappearance, another company put on a play on the same topic. The script was inspired by Russo's text (the play was directed by Luisa Crismani<sup>18</sup>), and once again there was an attempt to put on stage the complex relation between science and theatre. It is the same theme of another play performed a year earlier, *Il fuoco del radio. Dialoghi con Madame Curie*, written by Luisa Crismani and Simona Cerrato. This last play offered not only a biography of Madame Curie, but also a description of scientific research at the beginning of the twentieth century. As Crismani says, research, "just like

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<sup>17</sup> *Variazioni Majorana* – Play script of the RossoTiziano theatrical company – Napoli 1998

<sup>18</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Play script of the La Contrada theatrical company, Trieste, directed by Luisa Crismani – Trieste 1998

every other human activity, cannot be fully understood without some knowledge of the personal and individual story of its author. Scientific research is the result of thought, effort, but also of the passion of human beings” (see the interview with Crismani).

The play staged by the La Contrada company of Trieste originates from an extensive project on theatre and science, which boasts renowned productions such as *The life of Galileo*, by Bertold Brecht (the author wrote many versions of the play in the 1940s) and *The Physicists*, written by Friedrich Dürrenmatt in 1962.

### **The philosophical-existentialist hypothesis**

The philosophical-existentialist approach can mainly be traced to Russo’s essay *Ettore Majorana – un giorno di marzo*<sup>19</sup>, which, as we said, inspired a play and a TV documentary.

In Russo’s version our leading character commits suicide. He probably threw himself overboard as he was sailing back to Naples on the Palermo-Naples ferry during the night of March 27th 1938. The reasons underlying the suicide are deeply investigated throughout the book and are rooted in a complex interpretation that rules out a simple act of despair.

Russo is a strong supporter of this hypothesis. But which kind of suicide was it? In *The World as Will and Representation*<sup>20</sup>, which according to Russo Majorana knew well, Schopenhauer gives a clear explanation. We are nothing but will, manifesting itself in an evanescent existence. It is always but a vane aspiration. It is the whole painful world of representation, to which we all irrevocably belong.

In this existence made of suffering and painful illusions, lacking any real fulfilment, the only contradictory salvation is, according to Schopenhauer, some form of annihilation of the self. As we become aware of the horror of being, which each one of us is an expression of, only then can we repudiate that greedy will to live, which fills everything and everywhere is restless.

As stressed by Russo, however, by saying this Schopenhauer did not imply the idea of suicide. To kill oneself in despair because one cannot make the wishes come

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<sup>19</sup> *Ettore Majorana – un giorno di marzo* – Bruno Russo – Flaccovio Editore, Palermo 1997

<sup>20</sup> *The World as Will and Representation* – A. Schopenhauer – Translated by E. F. Payne, Peter Smith Publishers, 1990

true or out of too much suffering is in the end the extreme result of personal will and, as such, an expression of life, or rather an expression of the research of that Life denied to those committing suicide.

Then there is another form of suicide, which consists in letting yourself die and come to pieces. In this case, according to Schopenhauer, the complete denial of will can even annihilate the will to preserve the body through nutrition. This kind of suicide does not come from the will to live: the totally resigned ascetics cease to live because they completely cease to want.

In Russo's existentialist hypothesis Majorana makes this choice. And actually in one of his last letters to Carrelli, the director of the Institute of Physics in Naples, he says he took "a decision which is now inevitable and hasn't got a grain of egoism."

In the last word we seem to hear the echo of Schopenhauer's philosophy. This choice, stresses Majorana in his letter, is not egoistic because, though irrevocable, it does not result from a strong affirmation of his self.

As Russo says, that sentence of Majorana "suggests the idea of letting oneself go, of a deliberate but inevitable dissolution: a slow vanishing and dissolving into the sea."

Now we have reached the sea, that is to say the epilogue. And it is at this point that Russo's narration needs to put on stage, so to speak, Majorana's death. Of great significance, especially from a literary point of view, are the words of the physicist Giuseppe Occhialini, who had met Majorana in Naples a few days before he disappeared and, in an interview reported by Russo, had allegedly sensed his intention of committing suicide.

These words inspire Russo the ending of his narration. Occhialini compares Majorana's death to that of Martin Eden, the leading character of a novel by the same name written by Jack London<sup>21</sup>. Though Russo only reports a few words of the novel in a footnote, this is the core of the theatrical ending of the wisely built plot, and for its significance we had already reported it at the beginning of this essay:

"The lights of the Mariposa were growing dim in the distance [...]. Then he let himself go and sank without movement, a white statue, into the sea. [...] Down, down, he swam till his arms and leg grew tired and hardly moved. [...] His wilful hands and feet began to beat and churn about, spasmodically and feebly. But he had fooled them and the will to

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<sup>21</sup> *Martin Eden* – Jack London – The Modern Library, 2002

live that made them beat and churn. He was too deep down. They could never bring him to the surface. He seemed floating languidly in a sea of dreamy vision. Colors and radiances surrounded him and bathed him and pervaded him. What was that? It seemed a lighthouse; but it was inside his brain - a flashing, bright white light. It flashed swifter and swifter. There was a long rumble of sound, and it seemed to him that he was falling down a vast and interminable stairway. And somewhere at the bottom he fell into darkness. That much he knew. He had fallen into darkness. And at the instant he knew, he ceased to know.”

### **The epic-didactic approach of cartoons**

More mysterious and fanciful than ever, Majorana’s figure is to be found in some cartoons as well. In the album n. 191<sup>22</sup> of the successful series *Grandi enigmi di Martin Mystère, detective dell’impossibile* (“The Greatest Enigmas of Martin Mystère, The Detective of the Impossible”), published by Sergio Bonelli, the famous Sicilian physicist meets the inscrutable and learned detective Martin Mystère. Their encounter takes place in the parallel world of Elsewhere, a land out of time and space run by mysterious aliens in charge of steering the course of Earth’s events.

Castelli manages to give the Majorana’s episode the same epic-didactic quality typical of the whole series. Great attention is devoted to the description of the physicist’s biography and his idealist nature. It is the story of an extremely fascinating character, living in a particular historic conjuncture (that of the Second World War, during the race for the construction of the first atom bomb), which was marked by other renowned men like Fermi, Segrè, Mussolini and Carrelli. Majorana is presented as a positive hero, a resolute man aware of what he was doing rather than a cursed genius at the mercy of his sorrowful fate. Probably because he was addressing a very young audience, Castelli gives a more straightforward portrait of the Sicilian scientist, which is more suitable for this kind of cartoons.

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<sup>22</sup> *Il caso Majorana – Martin Mystère* – Album n. 191 - Sergio Bonelli Editore, Milano 1998 (texts by Castelli, drawings by Rinaldi and Filippucci)

In July 2001 Star Comics too publishes a story featuring Ettore Majorana (album n. 97)<sup>23</sup>. The text is by Ade Capone, who had already written some stories for Zagor and Martin Mystère.

Unlike Martin Mystère, Lazarus Ledd, the leading character lending his name to the whole series, which started in 1993, is a man of action rather than a sophisticated and erudite intellectual. Capone's episode has no historical-didactic aim and this time the character of Majorana mainly serves the purpose of representing an odd parallel world of famous people who have disappeared, like Elvis Presley. Nevertheless, the cartoon tells a little about his story and makes references to some passages of Sciascia's book.

### **Differences in representation**

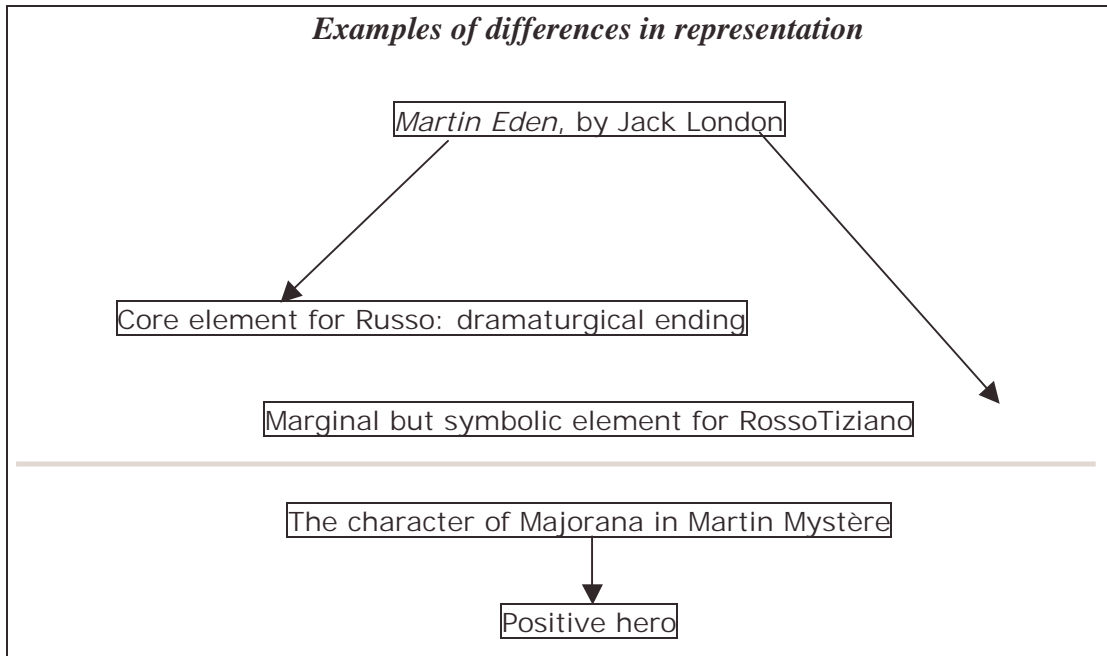
The differences in representation, as we said, are the result of the transfigurations brought about by each narrative mode. Let's look at some examples. In the ninth scene of *Variazioni Majorana*<sup>24</sup> two imaginary scientists, Herbert and Albert, play the most surrealist and grotesque table-tennis match ever played, a duel with scientific statements on nuclear fission. Majorana stands in the shade right in the middle of the table, as an ethereal umpire. The two competitors are facing each other. Instead of table-tennis bats they hold books: Albert has Dostoevskij's *Demons* and Herbert has Jack London's *Martin Eden*.

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<sup>23</sup> *Tra le ombre* – Lazarus Ledd – Album n. 97 – Star Comics, Roma 2001 (texts by Capone, drawings by Gerasi and Del Vecchio)

<sup>24</sup> *Variazioni Majorana* – Play script of the *RossoTiziano* theatrical company – Napoli 1998

It could seem an insignificant detail at first, though highly symbolic. But it cannot be so insignificant, since it is a passage from *Martin Eden* that serves as dramaturgical ending in Russo's essay.



Then it is clear that RossoTiziano's theatrical representation and Russo's literary representation, though starting from the very same content, i.e. the novel by Jack London, have significant functional differences.

The transfiguration can go far beyond new representations of an event in different narrative modes. Characters can be totally reshaped. Let's think of cartoons, for one. In the cartoons Majorana's character still has his stereotypical genius and his aura of mystery, but it was hardly impossible not to portray him as a positive hero. Making young readers aware of all the discomfort deriving from a deeper existentialist analysis would have led the episode to a completely different narrative mode. The epic and futuristic structure of cartoons requires in itself a character who, though disappeared, in the context of the story is a winner. And the story has to follow the rigorous patterns of the fight between good and evil. In the end good always prevails, of course. The hero simply has to be the upholder of good, and Majorana is fit for this role.

The transfiguration I found most evident of all was that of theatre: a distortion involving the flow of events. As the language of theatre turns the structure of the real story upside down, the life of the Sicilian scientist loses its spatial connotation and the figure of Majorana himself is brought closer to the audience.

In drama the narration follows no clear tracks, there are no causal developments and, from scene to scene, spectators feel free to perceive the characters as they really are in that particular moment of their life. In this case the influence of the sometimes stereotyped superstructures allowing a chronological narration seems to be reduced to a minimum. In biographical essays, on the contrary, events follow a rigorous chronological scheme which seems to trap the character in a rigid course, leaving little room for interpretation. Each moment of the narration seems to be consequential, as if everything had irrevocably been written already. The process of identification with the character on the part of the spectator or reader, which is extremely important in order to generate a strong perception of the event and imprint it in one's memory, is therefore deeply affected.

While the chronological order found in essays facilitates the understanding of the historical and scientific events Majorana was involved in, the language of theatre and partly the language of fiction allow a more direct and intuitive understanding of his psychological and existential profile.

Theatre generally tends to communicate through emotional channels. This does not mean it cannot get across scientific contents. Actually, scientific topics can have a remarkable impact on the audience when communicated through theatre. The language of emotions, typical of theatre and literature, can be an alternative and non-coded way (as opposed to mathematics, for instance) to explain those aspects of science and research which are intertwined with external factors such as history, personal choices of scientists, their fates and emotions.

Another important feature to be found in theatre and in other narrative modes is the transfiguration brought about by some kinds of metaphor. In all the texts mentioned so far (except maybe more technical essays like Amaldi's) there is a widespread use of literary and philosophical metaphors. This proves to be the quickest way to express important concepts concerning Majorana's inner world.

The following table shows in short the main references to philosophers and people of letters to be found in each work.

<i>Main references to philosophers and people of letters</i>	
<b>Russo</b>	<i>Emile M. Cioran, “The temptation to exist”; Arthur Schopenhauer, “The World as Will and Representation”, Luigi Pirandello and others.</i>
<b>Recami</b>	<i>Luigi Pirandello (3 out of the 8 “Dediche Introduttive”) From the critical essay of Aurora F. Bernardini - Leo Tolstoj, “Death of Ivan Illic”.</i>
<b>Sciascia</b>	<i>Stendhal, Albert Camus and others</i>
<b>Lea Ritter Santini</b>	<i>Bertold Brecht; Luigi Pirandello; Albert Camus; Friedrich Dürrenmatt, “The Physicists”; Leonardo Sciascia and others.</i>
<b>Rosso Tiziano</b>	<i>Wolfgang Goethe, “Faust”; Fedor Dostoevskj “Demons”; Jack London “Martin Eden” and others.</i>
<b>Capone</b>	<i>Leonardo Sciascia.</i>

Finally, the following table shows a brief summary of the different interpretations of Majorana given by each author.

<i>Representations of the character of Majorana</i>	
<b>Russo</b>	<i>Majorana as a genius ahead of his time, whose Schopenhauerian pessimism leads him to an existentialist rejection life</i>
<b>Recami</b>	<i>Majorana as genius and great scientist</i>
<b>Sciascia</b>	<i>Majorana as genius ahead of his time, deliberately rejecting science and scientific research the way they were meant back then</i>
<b>Bartocci</b>	<i>Majorana as genius and victim of political conspiracies</i>
<b>Amaldi</b>	<i>Majorana as genius and great scientist</i>
<b>Segrè</b>	<i>Majorana as genius and great scientist</i>
<b>Rosso Tiziano</b>	<i>Same representation as Sciascia, but in a surreal perspective</i>
<b>Crismani</b>	<i>Same representation as Russo, highly evocative and with literary references</i>
<b>Castelli</b>	<i>Majorana as a positive cartoon hero</i>
<b>Capone</b>	<i>Majorana as a positive cartoon hero</i>

Once again, leaving aside the unusual interpretations of Castelli and Capone (of high significance only in the specific context of cartoons), two general trends can be pointed out. On one hand there are those authors who were (Amaldi and Segrè) or are (Recami) physicists. As such, they are bound to a particular kind of research and method of inquiry, so they tend to highlight Majorana’s genius and his factual or potential contribution to scientific research, while placing him in a precise and detailed historical context. On the other hand there are those authors who shift to different fields and deal with psychological, philosophical, ideological and ethical issues, as they usually have a classic or literary personal background.

Both perspectives are of great worth and are equally effective in investigating the human being, be it from a historical-scientific or an introspective point of view.

## Interview with Erasmo Recami

The interview with Erasmo Recami mainly focuses on four topics: the importance of Ettore Majorana as man and scientist, the reasons for his disappearance, the fierce argument between Amaldi and Sciascia, and how other narrative languages represented this case and can deal with other cases related to science and scientists.

### **Why did you take an interest in Majorana?**

My interest started when I moved from Milan to Catania and I consequently became interested in the most significant events of the whole area. One day, for example, I happened to walk on some prehistoric ruins and this episode aroused an interest in the prehistory of Sicily.

I had wished to learn more about Majorana for a long time. This desire had been heightened by a talk with Sudarshan, one of the first physicists who developed the tachions theory, whom I met in 1971 while I was in Texas. And then I held a lecture on Majorana, which gave me the opportunity to meet some of his family. Afterwards I met his sister and, after a series of journeys to Rome and Catania, I thought I could ask her to see Ettore's writings. I asked her about his letters in particular, which had also been used as reference by Amaldi in some of his articles.

### **Which aspects of Majorana's life and works struck you the most? Which intuitions and scientific discoveries do you deem more relevant for current scientific research?**

I believe people probably realise that Majorana's greatness lies in renouncing to Nobel prizes to live an ordinary life. He showed us that human life is more important than anything else in the world. I also believe him to be the greatest theoretical physicist of the twentieth century, if we exclude exceptions like Einstein. And in the field of quantum mechanics and fields theory he certainly was the greatest.

He was ahead of his time of about fifty years, that's for sure. Let's take the group theory, for one. Only now has the mechanism developed by Majorana to give the neutrino a mass been attached the right importance, not to mention his elegance in understanding the exchange forces for the stability of the nucleus. He had this kind of aristocratic tendency to publish only top-quality works. Sometimes it was just a whim, like when he used to write his equations on packets of cigarettes and then throw them away, while in fact he had them all nicely written at home already. He didn't publish, but all of his works were extensively documented.

We probably still fail to recognise how outstanding he was from a scientific point of view. Any time we look back at his works we discover something new. Let's think of the idea of building an electrodynamic quantum based on variational principles, which he never published, or the recent work of Salvatore Esposito on how Majorana solved the famous equation of Thomas-Fermi. Fermi solved it numerically with the slide rule in a week, while Majorana solved it analytically in two different ways: first by turning it into an equation of Abel (Fermi said it was the equation of Riccati, but it actually

was Abel's) and second by inventing a new mathematical method to solve differential equations, which is still unknown.

I would be interested in seeing some writings which are now lost, like an article he was about to send to a German journal in which he stated he had developed an elementary particles theory. Of this article, which has never been published, Majorana only makes a brief mention in *Nuovo Cimento* in 1932.

### **What about his disappearance?**

The most reliable sources state he went to Argentina and I still receive witnesses confirming this hypothesis, but I have not checked them yet. Somebody told me he fled to Germany, then to Argentina, and eventually came back to Italy and hid in a monastery. This solution would not disappoint anyone! I was also told he died in a monastery in Versilia, an area he probably knew well as he used to go there too in the summer, but I haven't had time to verify this statement either.

I would say that according to most witnesses he was still alive. As to the hypothesis of a flight to Argentina, I am not convinced of it at all, but I don't know whether it is true or not. (Bruno Russo, for instance, did not find out much about it when he went to Argentina, while the television team of Canale 5 did, though their investigation was quite shallow.) We do have Carlos Rivera's witness, however, the then director of the Physics Institute of the University of Santiago (Chile), who collected two distinct testimonies in Buenos Aires confirming Majorana's stay in town. Tullio Regge then interviewed both witnesses himself and reported they seemed to be reliable.

I am inclined to believe he was still alive also out of psychological reasons. I think he preferred to lead an ordinary life like most people. He probably wanted to get away from his family. This could certainly be due to the strong personality of his mother in the frame of a southern Italy family of the beginning of the twentieth century (three out of five sons did not get married, and Majorana was one of them). Ettore's bond to his family was probably too strong, and that's why he left. He probably wondered for years whether he had the right to inflict such a big pain on his family, and in the end he resolved to leave when, as he used to say, the resolution is inevitable and hasn't got a grain of egoism.

### **Which side would you take in the now dated controversy between Sciascia and Amaldi – Segrè?**

I was in a very odd position, as I was very close both to Edoardo Amaldi and Leonardo Sciascia. Sciascia and I became friends because when he knew I had all the writings on Majorana he made contact with me.

I used to receive letters from both Amaldi and Sciascia, one discrediting the theories of the other. I liked Leonardo's ideas, except in the last years, but back then I leaned towards Amaldi. Sciascia certainly had had some significant intuitions. In his book, for instance, he stated that freepeople had been slaves and vice versa, meaning that the Americans had built the atom bomb while

the German scientists had opposed to it. Many disagree and believe that the Germans would have built it too, if only they had had the means to do so.

And they did not have such means, but new information has come out from the British secret service recordings of some talks between ten German scientists, among which Heisenberg. After fifty years these talks were no longer secret. In fact, they have been published in a book as well. They show how the Germans could have never built such a weapon.

So Sciascia's intuition proved to be right, but I still find other ideas in his book far from convincing. The presumed antagonism between Majorana's and Fermi's groups, for example. In his book Sciascia pursued literary, political and social aims and, even more relevant, a single episode had had a strong influence on his views. Once he was having lunch with Segrè and Moravia – if I am not mistaking they were in Switzerland – when Segrè boasted that he had built the atom bomb. Moravia nudged Sciascia underneath the table to stress Segrè's words. Sciascia was very indignant at it, and in a collection of thoughts (2) he hints at this episode.

I did not quite agree with Sciascia because he unfortunately believed a new Middle-Ages era was about to come, in which all the evils of society were to be ascribed to science. He believed that if we led a difficult and unpleasant life it was science we had to blame, and he made no distinctions between science, technology and industry.

Science is like poetry and art. It means no more than thirst and love for knowledge. Scientists can become technologists, of course, but at that point they are not scientists anymore, they are technologists. As such they can build a prototype, but then it is up to the economic and political power to decide whether to start mass production or not. Volta is not to blame for the electric chair.

**But if we think of Fermi and many others, back then there was not such a big gap between science and technology.**

At that time in Fermi's group – which included Amaldi as well – research was simply driven by love for knowledge, and that was all. Later on, unfortunately, things changed. But there had been those who, objectively speaking, refused to work on the atom bomb, and I'm not thinking of Majorana. He probably was the greatest theoretical physicist of his time, but he would not have been able to turn a screw and he could have never been involved in a technological process such as that of the bomb, which cost maybe more than two hundred thousand billions lira and required the construction of towns, streets and railways as well as thousands of soldiers to keep it secret.

There were those who consciously chose not to be involved in it. Rasetti is a well-known example. He started as a big expert in fossils, then became paleontologist and gained a worldwide reputation for his research on Cambrian in Canada, and at last became botanist. He died not long ago by the way, and he has probably been underestimated.

Sciascia believed Fermi and Segrè had worked on the atom bomb, and this choice was so unacceptable to him that he regarded the book on Majorana as his most significant work.

The point is that man differs from animals not qualitatively maybe, but almost certainly for two things: language and the use of tools. Let's put language aside, not because it is not important, but because it has nothing to do with Majorana. As to the making of tools, men inevitably used the cudgel to forge a knife, as with the latter they could defend their children from lions and cut the meat, but with a knife they could also stab their own brothers. Each tool inevitably serves both a good and an evil purpose.

Amaldi was annoyed not so much by the reference to the atom bomb, which he regarded as a dated issue, but by the fact that Sciascia had said that in 1937 Majorana applied for the chair of Theoretical Physics against the will of the others.

The chair was due to be assigned either to Giancarlo Wick from Turin, whose mother was a well-known anti-fascist, the Jew Giulio Racah, or Giovannino Gentile, son of the former Minister of Education and a top physicist (nobody knows he is the one who invented parastatistics). With Majorana coming into play the situation was turned upside down and the committee had to resort to the merit assignment. If this is how things really went, I take my hat off to the members of that committee, because thanks to this trick they elegantly managed to assign a chair to Giovannino Gentile as well, who really deserved it. Sciascia, however, did not share this view.

Actually, according to some of my sources things went the other way around: Majorana was convinced by the others to apply for the chair submitting a work which had not been published yet. So he sent in the now famous article on the symmetry of electrons and antielectrons, from which fundamental concepts such as the Majorana mass and Majorana spinor come from.

Amaldi was an energetic man. He used to call me and tell me that he felt very offended: after all he had done in his life he could not go to America because he had to keep the tradition of Fermi going here in Italy. He saw Leonardo Sciascia as the wrecker of his team's image.

Moreover, Amaldi believed I was on Sciascia's side because he knew I had given him some papers, but the truth is I was a friend of both. I did not take sides. But then, on Christmas Eve of 1976, Sciascia published a whole page in La Stampa and, among others, he explicitly attacked me as well, so Amaldi changed his mind!

**Could it be that back then Amaldi defended himself and the Italian scientific research on nuclear physics? Don't you think it could also be a matter of funding, as a famous writer like Sciascia could have a negative influence on public opinion and therefore jeopardise the funding for that particular field of research?**

No, at that time funding was not a big problem. The National Institute of Nuclear Physics (INFN) had just been established, and it seemed to work well until two years ago. It is only this last government which is cutting the funds. Back then things went quite well.

**Don't you think Majorana's idea of research was different from that of Fermi and the others both from a scientific and an ethical point of view?**

Yes, of course. He always thought science was the wrong path, because he could see beyond it. And it is also true that he was quite isolated.

**Could it be that Majorana refused to publish his works for a mere academic purpose, like it often happens in today's universities?**

Back then things were different, and the referees were not highly competent anyway. But there was an episode that struck him greatly. He had written the article on exchange forces, had published it in German receiving a payment by CNR, the Italian National Research Council and had said that was the only time he had earned money for a publication. On that occasion Sbordoni, a CNR executive, told him off because he had published the article in German and wanted him to publish it again in Italian, as the body that had financed him was Italian. Majorana, irritated, replied he would do so only if the Italian version counted as a publication. At the beginning he was asked only a summary to be published in *Ricerca Scientifica*, the journal of CNR. Out of spite, Majorana sent the article in shorthand! Then they agreed to make the Italian publication. It was probably because of this episode that he lately resolved not to send another article, which he had all set already, to a German journal. His disgust with human stupidity was stronger than average, and that's because of his great intelligence.

**What do you think of the works on Majorana, from essays to fiction?**

At present the work of any scientist is hard to understand even for another expert involved in slightly different activities. There is not much to say about a physicist if we go beyond his field of interest, and this is even more true for Ettore Majorana. A play can tell us something about his psychological struggles and the excellence of his mind, but cannot deal with his scientific activity.

There are three documentaries which are fairly good: one is by Bruno Russo, who first had the brilliant idea of interviewing Gilda Senatore, then there is one by Canale 5 and one by the Dubini brothers, which is more of an inquiry. What is interesting about them is that they contain many interviews. Apart from me, some friends of mine like Amaldi, Giberto Bernardini and Leonardo Sciascia were interviewed as well. The last of the three documentaries is a little longer than the others. It lasts about two hours, but it is very interesting.

As for the movie *I ragazzi di Via Panisperna*, by Amelio, it has nothing to do with Majorana. He was free to shoot any movie he wanted, as long as he did not call his characters Ettore, Enrico, and so on. And he had no idea of what scientific research was like, even back then.

There are good films, but in some fiction the characters' ethical and cultural profiles are much shallower than those of their real counterparts.

I also saw the play of RossoTiziano and I found it quite interesting, but as I was watching it I thought they had drawn quite a lot from my book.

And then there are absurd books suggesting Majorana was kidnapped by aliens. There is even a lady, a spirit healer, who wrote in her book she had had an interview with me and I had agreed upon her fanciful theories. But I was in the dark about all of it.

I also read a cartoon, that of Martin Mystère, which was not bad at all.

**Many different narrative languages have dealt with the story of Majorana. Do you think these works could be of any communicative value from a scientific point of view?**

Absolutely. It is good that they devoted attention to a scientist. Usually we only hear about singers. I am glad that Sciascia spoke about a scientist providing him with a psychological and human profile instead of describing a cold and maybe cynical being. These representations bring science closer to the public, though the quality of the scientific activity cannot get across.

The basic concepts can be communicated, but not everybody is able to get them across. I believe you need to know a scientific concept very well in order to be able to put it in an easy way and communicate it to the general public. There are good popular works. It has to be so, because it is right that the scientific activity makes its way to the general knowledge.

**Can scientific concepts be expressed through narrative modes like drama, which resort to the language of emotions?**

It would be wonderful, if only somebody did it. Somebody who has studied a lot is like a mystic, there is not much of a difference. Studying a lot is almost like preying a lot, because in both cases one reaches a significant human depth. Science is also made of mystical intuitions, but unfortunately scientists never speak about it. It would be fantastic if we could make people understand the ethical, mystical, cultural and artistic value of many scientific breakthroughs. They represent knowledge of nature and, for those who are religious, knowledge of God's design. But it is very hard to find anything like this. Going back to Majorana, Amelio tries to connote this group of young Italian boys, but he too is superficial. Sciascia, on the other hand, gave the scientist psychological and cultural weight, and that is the good thing about his work.

### **Interview with Luisa Crismani**

When interviewing the director Luisa Crismani, some of the questions asked were clearly different from those asked to Recami. In the interview that follows the questions focus mainly on Crismani's personal experience of putting on the play on Majorana and working on Russo's script.

**Why did you take an interest in Majorana?**

The decision of starting a theatre seminar on Majorana involved the Contrada-Sissa team as well, which was already working on a project on theatre and science. My personal interest dates back to a long time ago, more or less to my adolescence. I think it was mainly due to his mysterious

disappearance, but also to the charm of this young and talented figure. These spurs drove all my work back then, and I can still feel them today. I find it hard to remember all the details because after the first representation of a play I usually part from it. I cannot bear the possible adjustments and changes that sometimes have to be made after the debut.

**How did the collaboration with Russo start?**

After reading his book I wrote him a letter telling him about the theatre seminar I intended to start up. So we met and he said he would write the script. It was good to meet him, not only for the play on Majorana, but also on the whole, for we shared some interests and, I believe, some views as well.

**Why did you chose to base the script on Russo's work instead of, say Sciascia's book? What struck you of Russo's book?**

I think I was struck by his perspective, his psychological investigation on the characters and the attention devoted to his personal philosophical interests.

**What do you think of the other works on Majorana, from essays to television fiction?**

I found them all very useful and interesting.

**Which difficulties did you face in representing Majorana in a theatre mode? And what about science in general?**

Representing Majorana did not cause me any difficulty in particular, or rather it caused me the same problems I had with other biographies. It is different from representing fictional characters. What did trouble me was joining science and theatre. The passion for science cannot be expressed as a simple emotion; you need scientific contents to explain it, express it and communicate it to the audience. This would require a scientific knowledge on the part of the authors-actors, which they usually do not have.

**What did you recommend the actors to help them identifying with their characters as much as possible? How did the actors live the story of the Sicilian scientist?**

We worked on the play such a long time ago I really can't remember. But everything revolved around the idea of theatre within theatre. The actors had to act and perform their role, not to live it from within. We even had spotlights on the stage to stress this perspective. With his disappearance Majorana did step into the spotlights. But he is not there anymore. We are left only with actors, and we can only try to imagine him. All of him lies in his papers, in those studies which, I was told, are hard to understand even for mathematicians.

**Would you put on another play involving scientific contents?**

I don't know. I probably would if I could address an audience of scientists only and work with actors with a scientific background, and if I myself could have a deeper understanding of these scientific contents. I am not interested in telling the audience the passion for science or the positive and negative effects of scientific breakthroughs only. The real challenge would be to make science through theatre

or something like that, but I can't see how. We would have to work together, scientists and authors, allowing each other complete freedom. There should be no deadlines, no limits. But nowadays nobody is interested in this kind of things because they don't sell. It is a pity.

**Did you focus more on the historical-didactic reconstruction or simply on the dramatic and exemplary power of the story?**

Actually we had no didactic purpose, we did not aim at a historical reconstruction, neither did we think it was a particularly dramatic or exemplary story. Speaking of Majorana, mystery plays the lead. Mathematics itself has something mysterious about it, and so do numbers. Here we have a mathematician who reads Schopenhauer, acts Pirandello, refuses to publish studies regarded as strokes of genius by his colleagues because he considers them child's play, and suddenly one day disappears.. I believe mystery was the basic thread.

**Which expressive mode do you think can best describe Majorana's story? Which suits better the stories of great scientists or scientific topics in general?**

I am a firm supporter of writing. It is more precise and more evocative than any other expressive mode, and at the same time it leaves more up to personal imagination. My answer is: books.

**I think that, compared to other works, the importance of Russo's essay also lies in a deeper attempt to understand the existential reasons behind Majorana's choice. Were you not afraid to put on stage Russo's philosophical idea of a conscious rejection of life? I personally find it so vigorous and tormenting it almost scares me. What does it mean to you?**

In the script Russo does not explicitly state "Majorana committed suicide". Even if Majorana did commit suicide, he never said it or wrote it. He gave some hints (think of the encounter with Occhialini), like the card to his family ("do not go into mourning") or the letter to Carrelli. But we don't know it for sure. Let's say that, in real life as well as in the play, suicide was in the air (or rather in the roar of the sea). It was a possibility, a desperate tension to nothingness (or to the whole), a very "philosophical" – or even "literary" – entity. If he did make that choice, we should leave it to him and him alone. We can only imagine the reasons behind it. But wouldn't it be better if we just read his works?

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