Ettore Majorana: quantum mechanics of destiny

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We show that a number of apparently separate extravagant Majorana’s actions, including those connected with his disappearance are united by the invariant of behavior. It is based on ”carrying into life” the principles of quantum theory. We argue that the underlying motive force in the story of his disappearance consisted in existential intention to overcome the fixed frame of personal identity and dichotomy ”life – death” and mimic breakthrough to plurality of worlds.

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I. INTRODUCTION

In history of science Ettore Majorana (1906 - ?) is singled out not only by his outstanding works on quantum theory (see, for example, a survey on scientific heritage of Majorana in [1]) but also by his unusually striking personality. Unfortunately, there is only a few works devoted specifically to Majorana. Mainly, they are published in Italian – see, for example, brief bibliography in a recent paper [2]. It comes without surprise that it attracts attention of not only historians of science but also of peoples of art. In relatively recent years, it stimulated a series of artistic (in particular, theatre) works [3]. Probably, it is partially connected with the fact that in situations where a historian can say nothing, he hands on the baton to an artist, analysis being replaced by fantasy. Meanwhile, in spite of all uncommonness (sometimes even extravagancy) of what is known about behavior and actions of Majorana, in our view we can advance (at least partially) in understanding the logic that drove apparently extravagant actions of this exceptional man. We will see that in some these actions there are common features and this reveals very unusual character

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of what is traditionally designated as unity between life and work of a scientist. Their analysis leads to a rather unexpected conclusion and gives reason to speak about (using terminology of modern semiotics) "text of behavior". The aim of the present work consists just in uncovering such a text and its analysis. (As far as Majorana’s scientific activity is concerned, we touch it upon only to the extent that it is related to this aspect and do not discuss it on its own.)

It is a series of events and facts from Majorana’s life that we now turn to.

II. TRAVEL FROM PALERMO TO NAPLES

Here, the best known example is mysterious disappearance of Majorana. Mainly, discussion of this point is based on comparison and estimate of probabilities of different versions – whether Majorana committed suicide, retired to a cloister, left Italy for Argentina, etc. Meanwhile, even cursory acquaintance with known circumstances forces us to conjecture that the crucial point in the Majorana’s plan was, in the first place, not this or that concrete version but, rather, plurality of versions as such. (See below in more detail.) After so long period we can hardly expect to find an exact answer what precisely happened to Majorana – in full accordance with the Fermi’s remark that "with his intelligence, once as he decided to disappear or to make his body to disappear, Majorana would certainly have succeeded" ([4], p. 66). However, it seems we can understand something in the mechanism itself chosen by Majorana for his purpose.

Let us remind basic points of this story according to the description done in the Sciascia book [5]. (We quote from the English translation of this book which is published under the same cover with another Sciascia’s book [6]. For brevity, in what follows, we will simply give page’s numbers of [6] in parenthesis.) On 24 March of 1938 in evening Majorana supposedly embarked at Palermo. The ship arrived at Naples on 25 March.

"The fact that Majorana had undertaken the return journey and landed in Naples was confirmed by a return ticket which had been handed in and was found at the head office of the "Tirrenia". The fact that a person who could have been Ettore Majorana had traveled in the cabin assigned to him by that ticket was confirmed by Professor Vittorio Strazzeri who had spent the night in that cabin.

From the tickets handed in, it emerged that this cabin had been shared by Charles Price,
an Englishman, Vittorio Strazzeri and Ettore Majorana. It has been impossible to trace Price. But there was no difficulty in finding Professor Strazzeri, a lecturer at the University of Palermo.

To a letter from Ettore’s brother (presumably accompanied by a photograph) Professor Strazzeri replies that he doubts whether he did in fact travel with Ettore Majorana and whether "the third man" was an Englishman. However he’s "absolutely convinced that "if the person who traveled with me was your brother, he didn’t commit suicide at least not before our arrival in Naples" (163). As to the Englishman he questions the fact that he was called Price, for he spoke Italian "like one of us southerners" and he had the somewhat coarse manners of shopkeeper or even a more common person. This is indeed a case of "the third man". But the problem is easily solved. Since Professor Strazzeri exchanged a few words with the man he took for Charles Price and none with the one he thought to be Ettore Majorana it’s reasonable to suppose that the man who didn’t speak and whom Strazzeri later identified as Ettore Majorana was in fact the Englishman, while the one who he was later told was Price was a Sicilian, a Southerner, the shopkeeper he appeared to be and who was travelling with Majorana’s ticket. There would be nothing surprising in that. Majorana could have gone to the Tirrenia’ booking-office at the right time and given his return ticket to a man who was about to buy one and who may even have resembled him — in age, stature, complexion (it’s not hard to find even among a handful of Sicilians one who is typically Saracen)” (163).

The basic Sciascia’s idea about substitutions looks reasonable but he did not bring his thought to completion and did not draw conclusions which inevitably arise from it. Apart from this, his version contains logical inconsistencies or at least gaps. But, before proceeding further, we would like to dwell upon the mistake made by the English translator in [6]. The true meaning of the fragment "As to the Englishman he questions the fact that he was called Price” from page 163 of [6] is opposite: Professor Strazzeri does not put in question that his room-mate’s name was Price but doubts that it was indeed an Englishman since that man spoke Italian "like one of us southerners” and ”had the somewhat coarse manners of shopkeeper or even a more common person” (163). Italian original: "In quanto all’inglese, non mette in dubbio che si chiamasse Price, ma parlava Italiano”come noi, gente del sud” ed aveva modi piuttosto rozzi, da negoziante o giu’ di li” [5], page 60. (I thank Enzo Del Prete, Sergio Caprara and Lanfranco Belloni for explanations concerning language problems.)
Let us now consider the situation with passengers in more detail. In the room, beside Strazzeri, there have been two other passengers. For brevity, let us denote them as A (a person with whom Strazzeri exchanged a few words – "Sicilian") and B (silent person). Let us suppose that, indeed (as conjectured by Sciascia), A was fake Price whereas B was true Price. Hence, it turns out that the passenger A introduced himself calling the name of the passenger B but the passenger B did not protest. Then, it follows that Majorana planned and realized an entire hoax due to agreement with both passengers (not only with A, as was suggested by Sciascia). However, the Sciascia’s version is not the only possible one. Let us try to take into account main variants, accumulating them in a table.

| A                                      | B                                      |
|----------------------------------------|----------------------------------------|
| 1 Price                                 | Passenger like Majorana under his name |
| 2 Real Price mimicking fake Price       | Majorana                               |
| 3 Fake Price (not Majorana)            | Real Price under the name of Majorana  |
| 4 Fake Price making accent on his fictitious nature | Majorana as fake Price of the "2nd order" |
| 5 Fake Price (not Majorana)            | Fake Majorana (not Price)              |
| 6 Majorana under the name of Price     | Price under the name of Majorana       |
| 7 Majorana under the name of Price     | Fake Majorana (not Price)              |
| 8 Real Price                            | Real Majorana                          |

The straightforward variant of the hoax would have been restricted by replacing Majorana by somebody under his name. But this is only particular case 1 from a variety of versions. As a whole, the hoax under discussion confirms without doubts the Fermi’s remark cited above.

Now some explanations are in order. If manners and accent of the passenger A were intentional (variants 2 and 4), it was made to aim investigators to a wrong conclusion that Majorana was absent on the board, and the passenger B was Price. It is just the version pushed forwarded by Sciascia who deemed that "the problem is easily solved" (163). We did not include into the table more artificial variants (for example, the variant in which
A was real Price and B was a fake Majorana). Variants 6 and 7 imply some minimum of player capabilities in Majorana. We do not have such information but, nonetheless, left these variants for completeness. However, in our view, what is the most important, is not properties of concrete versions but, rather, the principal aim at the plurality of variants. (For this reason we included variant 8: although, as such, it does not contain direct substitutions, in a given context it is not quite obvious and, therefore, looks as one of variants of the hoax.) We deal with such a ”performance” in which impossibility to find an unambiguous solution is underlying meaning of the whole action rather than a pragmatic task.

Sciascia pointed out that the passanger A had to bear resemblance with Majorana (as in the course of investigation photos were to be showed only after some period of time and the 3rd passenger did not try to remember the appearance of room-mates intentionally, rather general resemblance was quite sufficient for Majorana’s purposes). Meanwhile, it follows from his reasoning that it is the passenger B who had to bear resemblance with Majorana to create false impression that Majorana was him. In our view, both passengers – A and B – turn out to be potential substitutes of Majorana. Correspondingly, they both (not only A, as Sciascia deemed) had to be like Majorana. The passenger A probably combined apparent features of Majorana, those of Sicilian (probably hired by Majorana) and of Englishman (name ”Price”). In a similar way, the situation was for B, but with the difference that his reticence could be interpreted as an additional factor in favor of identification with both Majorana and Englishman.

Thus, potential substitutions concerned all possible relationships within the triad M – A, M – B, A – B (here we denoted Majorana as M). In doing so, the substitution was performed not as a replacement of one personage by another with the entire set of his features but with entanglement of the features themselves. As a result, instead of deterministic (though incomplete, not known exactly) picture of the events, the essentially probabilistic picture is obtained. It arises due to a kind of the exchange effect and peculiar indistinguishability of constituents (in variant 6 of the table such an effect occurs directly). Analogy with quantum mechanics is obvious. Further, we will discuss it in more detail.

Now, we want to point out a rather amazing circumstance with translations of the corresponding fragment that seems to be not incidental. In addition to the mistake in the English version, there is also a misprint in the Russian one. In the phrase ”he spoke Italian ”like one of us southerners” (163) about the room-mate of Strazzeri, the Russian translator wrote
"spoke English" instead of "spoke Italian" [4], page 280. (In Russian: "po anglijski govoril "kak my juazhane"). Majorana has managed a kind of joggling with names, languages, identities, so that "Englishman Price" spoke Italian with Sicilian accent, etc. In such a situation it is not difficult to go astray and mix two languages or forget, what was put in doubt - name or nationality, etc. It can explain, why two qualified translators contrived to make a mistake in the same short fragment. In our view, they can be considered as victims of the Majorana’s hoax. In this sense, the hoax has been continuing and, so to say, in the double mistake of translators we can distinct echo of Majorana’s voice. Such relationships between text and life, text and its author, text and audience forces us to remember writings of Jorge Luis Borges.

Now we go on to another circumstances connected with Majorana’s disappearance.

III. LETTERS

At first, let us list a series of quotations from the Sciascia’s book. "On the evening of 25 March Ettore Majorana sailed on the 10:30 p.m. Naples-Palermo mail-boat. He’d posted a letter to Carrelli, Head of the Institute of Physics and had left one at his hotel addressed to his family. His motives for not posting it are obvious: he’d reckoned how things should and did turn out and he didn’t want his family to get the news too brutally, but by degrees. The letters have been read by many since Erasmo Recami, a young physicist who is in charge of the Majorana documents at Domus Galileiano, published them. But it seems worth reproducing them here. The letter to Carrelli reads:

Dear Carrelli,

I’ve made a decision that was inevitable. There’s not a single speck of selfishness in it, but I do realize that my sudden disappearance will cause some inconvenience to you and to my students. For this too I beg you to forgive me, but more especially for having betrayed all the trust, true friendship and sympathy you showed me during these months. Please remember me to those I’d come to know and appreciate at the Institute, to Sciuti in particular; of all these I shall preserve a fond memory at least until eleven o’clock this evening, and perhaps beyond” (160).

The letter to family: "I have only one wish: do not wear black. If you must conform to custom just wear some emblem of mourning, but not for more than three days. After that
remember me in your hearts, if you can, and forgive me” (161).

"Carrelli hadn’t yet received the letter addressed to him when he got an urgent telegram from Majorana sent from Palermo, begging him to pay no attention to it. (...) Later he received another letter from Ettore, from Palermo, on paper bearing the heading ”Grand Hotel Sole”:

Dear Carrelli,

I hope you got my telegram and my letter at the same time. The sea rejected me and I’ll be back tomorrow at the Hotel Bologna travelling perhaps with this letter. However I have the intention of giving up teaching. Don’t think I’m like an Ibsen heroine, because the case is different. I’m at your disposal for further details” (161).

The actions of Majorana contain a number of contradictions. At first, he sends a letter with a hint at suicide in preparation, later he abolishes it. It would seem that a sender should hope the 2nd letter to come first to cancel the 1st one with more than disturbed contents. However, instead of it, he expresses hope that both letters arrived simultaneously, as if they should demonstrate that mutually inconsistent version should be regarded on equal footing. The letter to Carrelli, as Sciascia pointed out rightly, contains an important ambiguity in the words ”I shall preserve a fond memory at least until eleven o’clock this evening, and perhaps beyond” (160). On one hand, this can be understood as a possibility of denial of suicide, from the other one – as an uncertain possibility to retain memory already ”there”.

"On 22 January he’d asked his mother to get his brother Luciano to withdraw from the bank his own share of their joint account and to send it all to him. And shortly before 25 March — the day he left Palermo stating his intention to commit suicide — he withdrew his October to February salary which, until then, he hadn’t touched. He had no money-sense, as is obvious from his neglecting for five months to cash his salary — but that he should cash it on the very eve of committing suicide is hardly credible. The one simple explanation is that he needed it for what he was planning to do.

There is, of course, another less simple explanation: that the sheer improbability of someone intending to commit suicide taking with him all the money of which he disposed as well as his passport might consolidate his mother’s hopes that he hadn’t killed himself and was still alive. But this is invalidated by his request to the family not to wear mourning — or if they must, that it be some inconspicuous token, and only for three days (the three days of the Sicilian ’strict mourning’). Clearly he wanted his death to be taken for granted”
In our view, from persistence with which Majorana creates all these contradictions, a quite different conclusion follows. Majorana wanted to achieve the existence on equal footing of different versions which otherwise should be taken as mutually inconsistent – whether he committed suicide or survived.

IV. REFERENCE TO IBSEN

It is worth paying attention to one literature reference. In the letter to Carrelli Majorana mentions Ibsen: ”I am not young girl from one of Ibsen’s plays, you understand, the problem is much more great than that” (161, p.63) or ”Don’t think I’m like an Ibsen heroine, because the case is different” (161). There are two Ibsens’s plays in which a young girl or woman commits suicide – ”The Wild Duck” and ”Hedda Gabler” (161). Plots of both are so far from the Majorana’s situation that it may look strange why Majorana mentions Ibsen at all. However, there is no any doubt that Majorana thought over his own disappearance very carefully, so that his letters are expected to contain no incidental or unnecessary details.

We can suggest the following explanation. In the given context what brings the remark about Ibsen to the forefront is the fact that in Ibsen’s works suicides is encountered in more than one play. As a result, it becomes impossible to identify the subject of suicide. Thus, two different motives – suicide and ambiguity (deidentification) of personality overlap.

The last circumstance, as we will see, revealed itself also in other actions of Majorana.

V. TALK ON THE CONFERENCE

The following Majorana’s escapade is known [4], p. 32; [8]. When Fermi asked Majorana’s permission to inform community about his theory of nuclear forces at the Paris conference, Majorana agreed under condition that his ideas must be ascribed to an old professor of electrical engineering who had to attend the conference. Meanwhile, one can find some inner meaning in this escapade if one takes into account that the subject of discussion is the theory of exchange forces in which there exists some kind of ”exchange of essences” between particles composing a nucleus. The example of such an ”exchange effect” (although in one way only) had to happen in case had the author of the Majorana’s idea (in a sense, himself)
VI. HOW MAJORANA OCCUPIED POSITION OF PROFESSOR

"During four years – from the summer of 1933 to that of 1937 – he rarely goes out and even more rarely turns up at the Institute of Physics. At a given point he stops going there altogether" (154). But, suddenly, he sends application to competition for the position of professor. Such "socialization" looks rather unusual for Majorana, specifically against a background of preceding period of isolated life. It is worth remembering circumstances of the competition. "As usual the three winners had already been tacitly selected before the competition took place: Gian-Carlo Wick, first; Gulio Racah, second; Giovanni Gentille Junior, third" (157). The result seemed to be determined in advance not only because of scientific merits of Wick and Racah but also because farther of Giovanni Gentile had some influence in ruling circles of the fascist regime. However, in case of participation of Majorana in the competition there would be no doubt in his win. Correspondingly, Gentile junior would not take a position at all. To prevent such development of events, Majorana was appointed to the Chair of Theoretical Physics of Naples "on the basis of his reputation and on the strength of law instituted by the minister Casati and revived in 1935 by the Fascists" (157). This gave possibility to complete the competition, as was intended.

According to the Sciascia’s opinion, Majorana ”had only take part in the competition as a bitter joke at the expense of his colleagues” (157). We deem that the point is different. In case of success of his plan, Majorana would occupy other’s position in the fixed hierarchy. Apart from this, inevitable further shift would occur in the arrangement of other participants of the competition: the 1st would become the 2nd, the 2nd would become the 3rd. Thus, some kind of the effect of deidentification would occur, similar to that concerning the abortive talk about Majorana’s theory of nuclear forces (see above).

VII. WAY OF POTENTIAL SUICIDE

Let us return to the problem of disappearance of Majorana. We tried to substantiate that the hoax both as a whole and in details had to have "probabilistic” nature and imitate probabilistic laws of quantum mechanics. Then, it looks reasonable to extend this circum-
stance to the way of suicide (real or fake) by itself – death in sea *waves* in such a way that both alternative versions be possible, leaving uncertainty – whether or not suicide was committed. This gives an idea to link it to the principal role of the *wave* function in which the special probabilistic nature of quantum mechanics (distinguishing it from the classical one) reveals itself. Such an interpretation unities both motives – probabilistic features and wave character of the corresponding object. As a matter of fact, the imitation of ”waves of probability” in reality is obtained.

**VIII. LIFE, DEATH AND QUANTUM MECHANICS: QUANTUM VERSION OF HAMLET QUESTION**

In the essay ”Valore delle leggi statistiche nella fisica e nelle scienze sociali” (”Role of statistical laws in physics and social sciences”) written during the period of isolated life in 1934 – 1937, Majorana wrote: ”A radioactive atom’s disintegration can force an automatic reactor to register it with a mechanical effect made possible by adequate amplification. Thus ordinary laboratory equipment is sufficient to prepare an extremely complex and showy sequence of phenomena ”set off” by the accidental disintegration of a single radioactive atom. From a strictly scientific point of view there is nothing to stop us from considering as plausible that an equally simple, invisible and unpredictable vital phenomenon might be the cause of human existence” (155).

In our view, this fragment should be juxtaposed with the problem, touched upon by Schrödinger in his seminal paper about paradox named later in his honor as ”paradox of the Schrödinger cat”. (This paper [9] appeared in 1935 and we refrain from discussion whether or not Majorana read it.) Schrödinger wrote that in a closed space the event of decay of a radioactive atom (which happens or does not happen with certain probabilities according to the laws of quantum mechanics) can trigger a chain of consequences resulting in death of a cat situated there. Thus, laws of quantum mechanics are applied to macroscopic objects, life and death forming a kind of superposition of different states. If our supposition is correct, *Majorana intended to model ”superposition” of state of his own life and death.*
IX. FROM QUANTUM MECHANICS TO TEXT OF BEHAVIOR

Thus, the picture outlined above seems to allow composing more or less clear fragment from what remained known about Majorana and circumstances of his disappearance. According to explanations under discussion, Majorana insistently imitated laws of quantum theory in surrounding world, his own behavior and destiny – the object of research merged with the subject. Remembering that in quantum mechanics one cannot neglect the presence of device with which a quantum object interacts in the course of measurement process, one can note that in such merging the specific features of quantum mechanics again manifested themselves. One can say that Majorana with the ultimate honesty brought to the logical limit the relationship between nature and an observer who is studying it, so important for quantum theory, having included here his own life and death. We would like to stress once again that concepts and phrases in everyday use of the kind ”unity between life and activity of a scientist” acquire in a given case quite non-trivial meaning.

One reservation is in order. There is a crucial difference between the imitation of quantum state described above and the true quantum state. The object of an ”experiment” (coinciding in this case with an ”experimentalist”), i.e. Majorana himself, was, of course, unambiguously alive or dead in each moment of time – quite another matter that his fate after disappearance was (and remained) unknown. In this sense, the opposition ”life – death” is of pure classical nature here. By contrast, for a quantum object the probabilistic nature and co-existing of alternatives (life and death in the case of the Schrödinger cat) are unavoidable in principle until the moment of measurement that selects one among the set of alternatives. (For example, in the case of the Schrödinger cat the counter reacts to the quantum decay of atom or does not react and, correspondingly, the ampoule with poison is broken or not.) Thus, possibilities of imitation of quantum properties (as well as, in essence, of any imitation) were restricted but Majorana realized them in full measure.

Whatever unusual the features under discussion be, it is worthwhile to note that parallels between human life and text were repeatedly noticed in humanities (in quite different context, of course). Thus, Lotman wrote that Pushkin intentionally permanently created his personality like an original artistic work [10]. In the case of Majorana the feature in question concerns destruction of life (at least for outer observers) rather than construction. But, anyway, it was performed on so high level that this forces us to recollect his scientific
works that gives integrity to his tragic fate.

X. MAJORANA AND PIRANDELLO

Composing features of human behavior into an united text can be connected, in particular, with orientation to already existing texts. Among other things, it concerns the situation of passing away. It is sufficient to recall the role of the Goethe’s novel "The Sorrows of Young Werther" that provoked in Germany an epidemic of suicides. As far as Majorana is concerned, we can point to a possible analogy between his disappearance and the plot of L. Pirandello’s novel "The Late Mattia Pascal". We recall that the main character disappears from his world where he is believed to commit suicide. Under a new name he starts a new life. However, some time later, he imitates suicide under the second name and returns to his native environment.

This analogy is well known and became a common place in literature about Majorana, it was even discussed in mass media (167). Nevertheless, in a given context we would like to pay attention to some important nuances which probably escaped from previous discussions. Direct motivation for this hypothetic analogy consists in disappearance with imitation of suicide. Meanwhile, it is essential that something more is contained here as well. The transition between "this" and "that" worlds in the Pirandello novel turns out to be two-way – back and forth. Therefore, this could be perceived by Majorana as equality of both states, literature version of the superposition discussed above. Apart from this, such "quantum jumps" were combined with the deidentification of personality since the character of Pirandello changed his name twice (cf. what was said above about this issue). In the given context it makes sense to recall also that one of circumstances that promoted the choice of Mattia Pascal to leave his previous life was his big loss in roulette, i.e. essentially probabilistic factor.

It is also worth paying attention to the motif of doubling. In the obituary devoted to Pascal his suicide was represented as repetition of the 1st unsuccessful attempt from which he was allegedly saved by the guard. This obituary notes that for the second time such a person (the name of the guard is called) was missing. In other words, it discusses a "virtual story" with a double, absence of which proved to be fatal for the character’s fate. Thus, not only a "real" character’s fate but also its wrong version ascribed to him, turns out to be
connected with such a factor as plurality of embodiments of the same personages (including the secondary one). Respectively, one may speak about plurality of corresponding variants in the individual history of a person.

Thus, a whole complex of motives actual for Majorana is revealed – "transitions" between life and death, "transitions" between different personalities, the role of probabilistic nature of the world in human’s fate, actuality of alternative variants. For these reasons, we deem that the given novel by Pirandello played even more important role in disappearance of Majorana than one could expect. It concerns not only borrowing from the plot but, rather, ideological and motif proximity – Majorana found in the Pirandello works artistic interpretation of the problems actual for him.

In turn, all this forces us to take seriously the potential role of one more Pirandello’s novel in the fate of Majorana. Discussing the analogy between the behavior of Mattia Pascal and that of Majorana, Sciascia notes that "in fact it conforms more to that of the hero of "Uno, nessuno e centomila" (167) ("One, None, and a Hundred Thousand"). Unfortunately, Sciascia does not explain his thought. Meanwhile, account for themes and motives discussed above uncovers here striking resemblance between spiritual world of Majorana and problems touched upon in the novel, connected with plurality of personality. For example, the author mentions a "hundred of thousands" of Moscarda’s (Vitangelo Moscarda is the hero of this novel), multitude of heads which in fact constitute the same one, operates by multiple images of the same reality, discusses the multitude of names for the same hero, etc.

In the novel, plurality of personality is connected with plurality of viewpoints, i.e. a subjective property. As far as Majorana’s world outlook, there is a reason to expect that he proceeded much further, having tried to turn for himself the property under discussion to the factor of objective reality.

XI. ON MAJORANA’S MOTIVE FORCES

Up to now, we mainly discussed formal features of the "text of behavior" which was found in a number of Majorana’s actions. It is quite natural to ask how to give a meaningful interpretation to the structure found and, as far as possible, to gain insight into the main Majorana’s task connected with this "text" and psychological motives of its "author". Here, explanations will look more hypothetical than in the case of direct systematization of
separate observations. Nonetheless, we find such a way to pose the problem not only quite rightful but also necessary – as a matter of fact, we should draw all possible conclusions from already uncovered basic points.

As in the "text" under discussion fundamental issues of life and death were touched upon in a quite unusual way, one can think that the corresponding motive also had existential nature. Let us recall that Majorana "was a pessimist by his nature and was permanently discontented by himself (and not only by himself!”) \[8\], p. 27. With this circumstance taken into account and generalizing our previous observations, it looks appropriate to make the following conclusion. *Majorana was not content not only with his own place and fate but with life and laws of existence as such.* In doing so, the main edge of dissatisfaction was pointed against unambiguity and the absence of choice. On the individual level, it manifested itself in the intention to ruin an unambiguous identity of life. It is just the reason why he suggested ascribing his own ideas to somebody else, tried to replace (for a future investigator of his disappearance) himself by a whole set of persons, etc. On a more general level, this revealed itself in the intention to cancel an unambiguous border between life and death. It was not simply a question how to change psychological attitude to such fundamental categories as life and death but, rather, change their nature as such (at least, purely subjectively, as imitation). In doing so, when Majorana planned and realized his so unusual disappearance, he did not try to arrange the "performance" for spectators. More exactly, it was him who was the only adequate spectator who understood what and why he was doing – all these substitutions on the ship seem to have been acts of autocommunication.

If our psychological reconstruction is correct, it entails important conclusions in what concerns the real fate of Majorana. There are three main versions of what he did: 1) retired to a cloister, 2) committed suicide, 3) hided himself in another country. In our view, now version 1) should be certainly rejected. The concepts concerning existence and no-existence described above were inconsistent with traditional Christian ones. And, to the extent in which Majorana retains his religiosity, his concepts, intentions and actions were certainly theomachistian, denying in the existential rebellion basic laws established by the Creator. But, it seems more probable that they simply had nothing to do with Christianity – Majorana intended to raise for himself his own, individual world unlike those known before.

Thus, only two versions remain. Plurality of personality, so important for Majorana, gives reason for cautious optimism in the favor of version 3) – actually, life in another country
under an assumed name, would turn out to be for him an analogue of another life. (See next Section for more detailed discussion.) From another hand, Majorana could not miss the point that each time he faced with only one reality but not two (or more) its alternative versions simultaneously. With his permanent pessimism, such inevitable disappointment could lead to a tragic result, so version 2) cannot be excluded. Whatever real history of Majorana be after disappearance, in any case we seem to be able to recover one important detail. In our view, Majorana provided himself with an alternative identity card – not only because of necessity to solve a pragmatic task but also for the reasons explained above. And, even if his life finished tragically, he had some time to feel himself as someone else.

**XII. ALTERNATIVE WORLDS**

Generalizing previous observations, we must conclude that, for Majorana, the most important property of the world was *plurality of relaity*, the existence of alternatives. As a result, in such an Universe possibilities appear that would have been mutually inconsistent in a classical world. Imaging other’s reaction to his disappearance and the variants which they had to take into account (thus, in a sense taking their viewpoint), Majorana could himself turn into a conditional spectator, watching mentally different version of his fate.

Then, such plurality means even something more than simply analogue or imitation of laws of quantum mechanics. Even in quantum mechanics with its unavoidable probabilistic nature in each experiment eventually only one choice of alternatives occurs. Meanwhile, the preceding analysis forces us to think that it was important for Majorana to embrace and feel different alternatives just as *real events* – at least through perception of other people. In other words, to live or feel different variants of his fate including his own death. This circumstance strengthens arguments against version 2) – at least, Majorana could not commit suicide at once since he needed to spend some time as an observer of different version of his own fate. Thus, according to our approach, the key role in motive powers of Majorana has been played by the idea about plurality of worlds, interpreted not as a set of abstract possibilities (from which only one is realized), but rather as *real* variants.

It is striking that in recent years such an idea indeed appeared in science, namely in quantum cosmology based on inflation theory and quantum theory. According to ideas, pushed forward in [11] - [13], there exists an infinite number of universes but only a finite
number of possible histories. One of consequences consists in that if in a given region of spacetime some history is realized, its other variants are inevitably realized somewhere else. One may suppose that these ideas would turn out to be congenial to Majorana. It is interesting that in recent years similar ideas are becoming topical in art and literature. First of all, it concerns the technique of "nonlinear narrative" due to which the same novel can have different versions of the same events and different denouements. (One of the brightest representatives of this direction is Milorad Pavich.)

In application to the Majorana case the paradigm under discussion means that there exist worlds in which Majorana did commit suicide. However, there also exist worlds in which Majorana has managed to overcome his pessimism and survived. It remains to hope that the second variant is more frequent in Universe.

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