

A Study of Danielewski's *House of Leaves* in the Light of Modern Physics

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Abstract

The current study is an analysis of Mark. Z. Danielewski's *House of Leaves* in terms of physics and cosmology's theories. It is applied the cosmology theories such as Wheeler's the participatory anthropic principle to identify reality in microcosms (the novel) and in the macrocosms (the universe), Poplawski's theory about the black hole to show the comparison between this theory and Chinese boxes structure of the novel and the effort have been made to trace fourth-dimensional space' signs in the novel to explain why the novel has an unusual format. With the help of these theories mentioned, it is proved there is a close relationship between postmodern literature and physics. In the twentieth century, discoveries in science have affected literature and *House of Leaves*, like other postmodern works, was influenced by modern physics.

Keywords: cosmology, modern physics, metafiction, postmodern novel, reality.



Introduction

Postmodern literature has been affected by diverse ideas and movements. Postmodern philosophy tries to conceptualize the world as being impossible to strictly define or understand. The researcher believes that postmodernism borrowed its philosophical ideas from the discoveries in modern physics. Modern physics is the post-Newtonian notion of physics in the early twentieth century. Modern physics is based on quantum mechanics or Einsteinian relativity. Postmodernism was emerged roughly thirteen years after presenting the uncertainty principle which could be possible new science in the twentieth century has affected shaping this literary school. Waugh says about the uncertainty principle in her book *metafiction* that metafiction lies on a version of the Heisenbergian uncertainty principle [1]. The current research aims to show the relationship between postmodern literary techniques and modern physics especially cosmology theories. The researcher has an interdisciplinary look at the postmodern novel, explains the elements of postmodernism with the cosmology theories in physics and tries to bridge the gap between literature and physics. This study leads to a better understanding of postmodernism, especially metafiction. The knowledge is in truth like body parts. Interdisciplinary research helps people have a comprehensive look at the knowledge and put puzzle pieces together to reach to more complete cognition. This study cause making connections between ideas and concepts across different disciplinary boundaries. Students learning in this way are able to apply the knowledge gained in one discipline to another different discipline as a way to deepen the learning experience. Students learn cosmological theories in the term of mathematics. Applying physics theories to literature shows the concept of these theories in everyday life. The writing style of *House of Leaves* links to physics theory that it shows literature and physics have influenced each other.

Literature Review

In the thesis “Textual Space and Metafiction in Danielewski’s *House of Leaves*” by Simon Barton, it is presented an argument that through employing metafictional techniques, experimentation with textual and graphic space and allusions to hypertextual devices, Danielewski’s *House of Leaves* seeks to remind the reader of the presence of the book in print fiction. The first chapter of the thesis examines the potential of metatexts and criticism in the twenty-first century and a questioning of its continued relevance. Danielewski challenges textual space that potentially distances the reader from the narrative. There is an overwhelming amount of blank space in the text where there could have been a narrative. The reader is told on several occasions that parts of the narrative are missing. Chapter two is concerned with references to the book and the unconventional page aesthetics that encourage the reader to initially looking at the page before actually ‘looking through the page’. The final chapter compares *House of Leaves* with the hypertext fictions that it so often mirrors [2]. In this thesis, the postmodern techniques of the novel have been fully investigated. In this research, the researcher examines postmodern techniques in the light of physics theories.

The thesis “Reader Agency and Intimacy in Contemporary Horror Fiction” by Aslak Rustad Hauglid examines how recent/contemporary horror fiction uses the establishment of reader intimacy and challenges to reader agency in order to create experiences of horror. The first argument is a claim that the aesthetic, narrative and in some case interactive dimensions of the examined horror texts illustrate how these texts seek to shorten the distance between reader and author, while simultaneously questioning the power the reader possesses in relation to the text. All of this takes place in the pursuit of creating an effective experience of horror [3]. The researcher has used this thesis to describe the narrative from the perspective of the cosmological theory to investigate the existence of the fourth dimension in *House of Leaves*.



The article “The Labyrinth as an Anti-Home in Mark Z. Danielewski’s *House of Leaves*” by Magdalena Solarz examines the spatial model of a house as a labyrinth in Mark Z. Danielewski’s experimental novel *House of Leaves* in relation to Yuri M. Lotman’s concept of an anti-home. The paper aims to analyze the spatial organization of the house presented in the novel and its influence on the characters. It also examines the connection between the mental state of the inhabitants and the changing nature of the labyrinth by demonstrating how the subversive spatiotemporal organization of domestic space accounts for the transformation of the novel’s protagonists [4]. The article is used to examine the black hole and the nature of the house in the novel.

In the article “Indeterminacy in Postmodern Fiction.”, Ma explains Indeterminacy, an intrinsic feature of postmodern fiction. This article focuses on the indeterminate feature of postmodern fiction, which refers to a complex category that is composed of various different concepts such as ambiguity, discontinuity, heterodoxy, pluralism, randomness, revolt, perversion and deformation etc. After a brief review of postmodernism and postmodern fiction, the paper explores the feature of indeterminacy embodied in the theme, plot, characters, language of postmodern fiction [1].

In *Black Holes*, it is explained that the remains of collapsed stars, black holes possess enormous gravities that pull in and annihilate any matter that strays too close. The latest evidence and theories for these bizarre objects are presented in this intriguing book, including how black holes were first predicted, how they form, their physical properties, and how scientists detect them. Also covered are the giant black holes now known to lurk at the centers of most galaxies and the possibility of using these objects as cosmic gateways [5]. In this book, the black hole is completely investigated from the perspective of physics. The researcher used this book to explain the existence of the black hole in *House of Leaves* and the similarity between the house described in the novel and the black hole.

Waugh in her book *Metafiction*, defines the genre of metafiction and its characteristics. *Metafiction* begins by surveying the state of contemporary fiction in English literature. The book argues that metafiction uses parody along with popular genres and non-literary forms as a way not only of showing the inadequate and obsolescent conventions of the classic novel but of suggesting the lines along which fiction might develop in the future.

Though there are some studies on *House of Leaves*, metafiction and modern physics, none of them incorporates literature and physics. In fact, the newness of the present researcher’s study is in her attempt to apply the cosmology theories to *House of Leaves*.

Methodology

One of the famous figures in quantum mechanics is Nikodem Janusz Popławski [6]. He is a theoretical physicist and famous for the hypothesis named the black hole cosmological model. This hypothesis was listed by National Geographic and Science magazines among their top ten discoveries of 2010 (*Nikodem Poplawski*, n.d.). His research is about the nature of gravity and space-time, the origin and composition of the universe, the origin of fields and particles and quantum gravity. His research focuses on how gravity with spin and torsion can solve fundamental problems in cosmology and explain the nature of black holes (*Nikodem Poplawski*, n.d.).

Based on Poplawski’s theory, our universe could have itself formed from inside a black hole existing inside another universe. *House of Leaves* contains multiple layers of fiction that are hierarchical (See Fig.1). Each layer can be considered a world contains the black hole which plays a role as a doorway to another world [7].

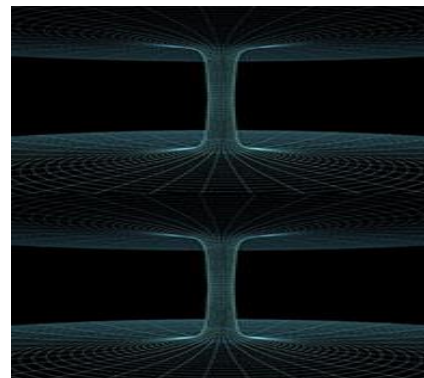
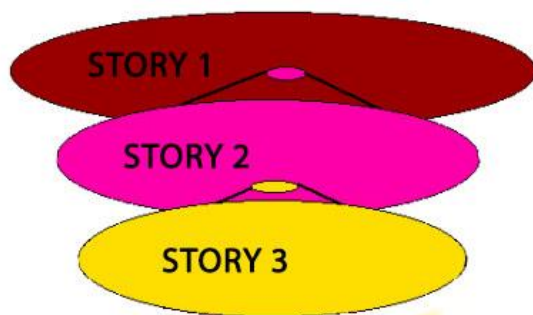


Figure (1) Note. The structure of the novel is similar to Poplawski’s theory. The left image shows the plot structure of *House of Leaves*. There is a story within a story within a story. The right image shows Poplawski’s cosmological model.

John Wheeler (1911 - 2008) was an eminent American theoretical physicist, perhaps best known for having initially coined the terms “black hole”, “wormhole” and several other colorful phrases. In the 1930s, he developed the important “S-matrix” in particle physics and worked with Niels Bohr to explain nuclear fission in terms of quantum physics. Later, he developed the equation of state for cold, dead stars, helped popularize the study of general relativity in the mainstream of theoretical physics, and to firm up the theory and evidence for black holes. He also collaborated with Albert Einstein in his search for a Grand Unified Theory of physics. He began to speculate that the laws of physics may be evolving in a manner analogous to evolution by natural selection in biology, and he coined the term “participatory anthropic principle” to describe his version of the anthropic principle, in which observers (in other words us) are necessary to bring the universe into being (Mastin, 2021). Wheeler received numerous honors over the years, including the National Medal of Science, the Albert Einstein Prize, the Enrico Fermi Award, the Franklin Medal, the Niels Bohr International Gold Medal and the Wolf Foundation Prize [8].

The researcher believes that the philosophic idea of modern physics and theories had a great influence on postmodern literature. Many works that are called postmodern contain metafictional elements. Metafiction is a form of literature which Patricia Waugh in her book *Metafiction* introduces it as “a term given to fictional writing which self-consciously and systematically draws attention to its status as an artifact in order to pose questions about the relationship between fiction and reality” [1].

One of the prominent postmodernist writers is Mark Z. Danielewski [4]. He is the author of the award-winning and bestselling novel *House of Leaves* [9], the novella *The Fifty Year Sword*, which was performed on Halloween three years in a row at REDCAT, and National Book Award finalist *Only Revolutions* [9].

Danielewski’s works are characterized by complicated, multi-layered typographical variation, or page layout. Sometimes known as visual writing, the typographical variation corresponds directly to the physical space of the events in the fictional world as well as the physical space of the page and the reader. In 1988, Danielewski graduated with a degree in English Literature from Yale, where he studied under John Hollander, Stuart Moulthrop, and John Guillory. He was also inspired by Harold Bloom. In 1989, Danielewski moved to Berkeley, California, where he enrolled in an intensive Latin course at the University of California,



Berkeley. He then pursued graduate studies at the USC School of Cinema-Television in Los Angeles [10].

House of Leaves, Danielewski's first novel, won numerous awards and it was a 10-year project. *House of Leaves* translated into numerous languages, including Dutch, French, German, Japanese, Russian, Polish, Serbian, Spanish and Greek. It continues to be taught in universities in the United States and abroad.

Based on the researcher's studies, it was realized that there had not been a conversation between literature and physics. Waugh concisely said about the uncertainty principle in her book *metafiction*, but she did not examine how the uncertainty principle or modern physics worked in metafictional novels. So, this study clarified cosmology theories and Einstein's theory in Danielewski's masterpiece, *House of Leaves*, to show how literary techniques were related to the concepts of modern physics.

First, the researcher showed how from the heart of every story of *House of Leaves* came another story and the hierarchical stories were the same as Popławski's black hole. The researcher applied Wheeler's participatory anthropic principle theory on *House of Leaves*. In Wheeler's view, an actual observer was needed to cause the collapse of the wave function. This means that the universe itself came into being only if someone was there to observe it. In the novel, it was found someone who caused wave function collapsed and expressed the reality of the novel. This person can be a character or the reader of the novel. The self-conscious narrator is the literary technique that causes the wave function collapses. This technique was studied in the text to show the relationship between the participatory anthropic principle theory and *House of Leaves*. Poplawski's black hole theory and the Chinese boxes structure of the novel examined. Russian doll is a modern interpretation of Chinese boxes. The first Russian nested doll set was made in 1890. In postmodern literature, which was emerged after the Second World War, Chinese box worlds refer to a novel that is told in the form of a narrative inside a narrative which Snow believes this idea comes from nature black holes [11]. In the end, Einstein's general relativity is discussed briefly and the signs of the higher dimensional space in the novel are shown. The researcher tried to study the primary visual elements such as line and dot and the unusual arrangement of the words and sentences to show the reader moved from the two dimensions to the fourth dimension.

Discussion

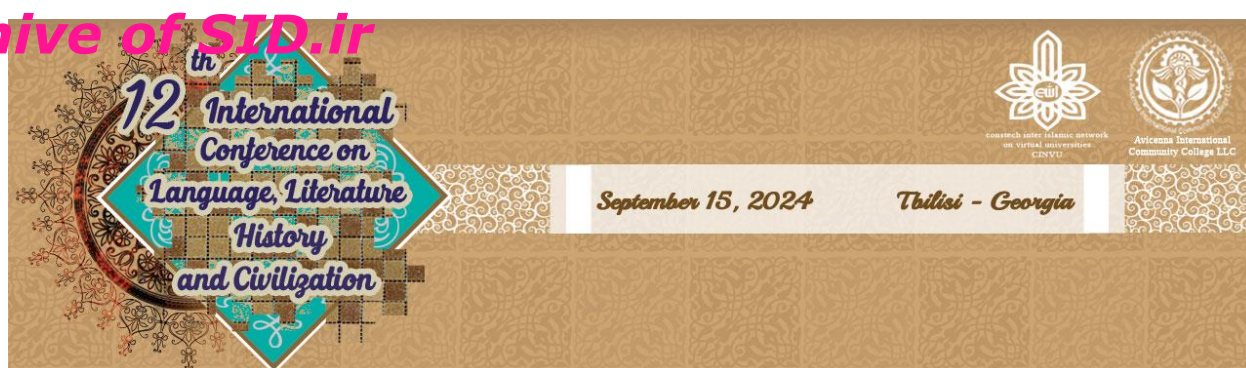
In the Process of Reading Wave Function of Characters Collapse

In the physicist's world, this question rises that if no one is there to see the universe, does it exist? And same as this question rises in literature's world that if no one reads *House of Leaves*, do the characters exist?

The physicist Wheeler proposes the participatory anthropic principle (PAP). He said that people exist in a "participatory universe." In Wheeler's view, an actual observer is needed to cause the collapse of the wave function, not just bits and pieces bouncing into each other [12]. This principle indicates that the reason the universe has the properties it does is that we're here to observe them. If it had vastly different properties, we would not exist [12].

This stance goes significantly further than the strict tenets of the Copenhagen interpretation, but it cannot be completely dismissed when you look in depth at the quantum evidence. If you never look at the quantum system, then for all intents and purposes it always stays a quantum system. Schrodinger's cat really is both alive and dead until a person looks inside the box [12].

To John Barrow and Frank Tipler in their popular and widely controversial 1986 book *The Anthropic Cosmological Principle*, this means that the universe itself comes into being only if someone is there to observe it. Essentially, the universe requires some form of life present for the



wave function to collapse in the first place, meaning that the universe itself could not exist without life in it. Most physicists believe that the PAP approach places humans in a crucial role in the universe, a stance which went out of favor when Copernicus realized Earth was not the center of the universe [12].

One of the essential aspects of postmodernism is the reflection on the following question: what is reality? In the postmodern understanding, interpretation is everything; reality only comes into being through our interpretations of what the world means to us individually [13].

After Nietzsche announced God's death in the late 1880s, French theorist Roland Barthes followed suit and published his article "The Death of the Author" in 1967, which placed great emphasis on the importance of readers' participation and cooperation in novel creation. Previous literary creation stresses the author's dominance in the production so a novel is completed as soon as it is composed by its writer and readers will have to passively accept it. As postmodern fictionists believe, the work created by a writer is half done, and the other half is to be finished through the reading and imagination of the readers. Therefore, closed texts are opened by postmodern novelists and the previously advocated explicit works are indeterminate with postmodernism. Themes designed by authors thus "die" with them, and the meaning of fiction depends on the understanding of each reader [1].

Microcosm means Mankind viewed as the epitome of the whole Universe and Macrocosm is the Cosmos which is the whole complex structure of the Universe. Charaka, says "Man is a miniature universe" and Yajurveda says "As is the individual, so is the universe, as is the universe, so is the individual" or "As is the atom, so is the Universe" or "As is the human body, so is the Cosmic Body" [14]. Marja de Vries while explaining Underlying organizing principles in book *The Whole Elephant* that "Everything is revealed as a vast interconnected whole, permeated by the same patterns. This marvelous order in the universe is illustrated by the Greek word kosmos, which means 'order' and 'decoration' as well as 'universe' [14].

If it is considered the participatory anthropic principle theory as a macrocosm and the novel and its process of reading as a microcosm, the participatory anthropic principle theory can be applied to *House of Leaves*.

In Chapter XIII of *House of Leaves*, Johnny questions his reality and wonders if he is simply a character in a book [9]. Johnny has just stated that he thinks that The Navidson Record only exists because of himself, "I am its source, the one who feeds it" [2].

Johnny's point of view about himself is the same as Wheeler's participatory anthropic principle. He believes that his existence depends on someone else. Johnny's mental state is rapidly deteriorating; his perception of his life is collapsing itself around him which ironically gives him his greatest moment of self-awareness:

A moment comes where suddenly everything seems impossibly far and contused, my sense of self derealized and depersonalized, the disorientation so severe I actually believe — and let me tell you it is an intensely strange instance of belief — that this terrible sense of relatedness to Zampano's work implies something that just cannot be, namely that this thing has created me; not me unto it, but now it unto me, where I am nothing more than the matter of some other voice ... possessing me with histories I should never recognize as my own; inventing me, defining me, directing me ... that all of this has just been made up and what is worse, not made up by me or even for that matter Zampano. Though by whom I have no idea [9].

He thinks someone creates, defines and directs him. This means that Johnny comes into being only if someone is there to observe it. He then suggests that the work has created him, he does not know if Zampano has created him or some other external person unknown to him [9].



In the novel, the reality of the characters in the novel depends on someone to read them. The reader can be a person who takes a physical book and reads it or The Navidson Record that awakes Johnny's subconscious mind and his memories of his childhood, however, if none of them exist, Johnny's being is both real and unreal. The character's existence lies in superposition and when the observer looks at one of these possibilities, the reality appears to him or her.

Reflexivity can be used as a device of alienation, a way of resisting the reader's naturalization of the text according to the logic of reality. Shklovsky says, "Reflexive fiction works to shake the reader from his complaisance and disrupt his confidence in his previous perceptions" (Landa 42). According to the participatory anthropic principle, human beings have a privileged position within the universe. Similar to this theory, *House of Leaves* lets the reader has an active role in the creation of the story. Reading *House of Leaves* is based on the interpretation of the reader. In the process of the reading, multiple interpretations create the parallel worlds and when the reader makes choice, the wave function of the novel collapses and the uncertainty situation becomes definite.

Danielewski successfully achieves this in his text by using of the device of alienation like the unorthodox font choices, the pages in *House of Leaves* are not always traditionally strict in their structure; the words in *House of Leaves* are often upside down, vertically descending or ascending and at certain points, span several pages [9]. The reader is constantly alienated by the shifting boundaries and yet, constantly adapts to the new reading challenges in order to understand the graphic device that he is employing [9]. This structural method challenges the conventions of reading and the act of reading and the reader's interpretation shapes reality.

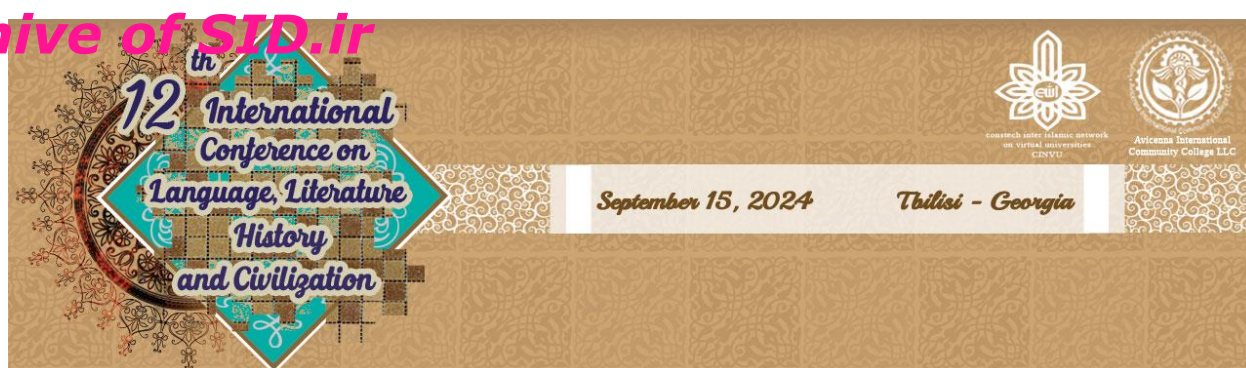
A Monster in Cosmos, a Monster in the Ash Tree

One of the consequences of Einstein's general theory of relativity was a solution in which space-time curved so much that even a beam of light became trapped. These solutions became called black holes. Black holes are believed to form when stars die and their massive bulk collapses inward, creating intense gravitational fields [12]. The physicist Kip Thorne, one of the world's leading experts on black holes says:

Of all the conceptions of the human mind, from unicorns to gargoyles to the hydrogen bomb, the most fantastic, perhaps, is the black hole: a hole in space with a definite edge into which anything can fall and out of which nothing can escape, a hole with a gravitational force so strong that even light is caught and held in its grip, a hole that curves space and warps time ways frightening. [5]. Maybe the most important character in this novel is the house in The Ash Tree Lane which the Navidson family lives there. The house because of some characteristics is like a black hole which is a mysterious cosmic monster. From the black hole not even, light can escape its gravitational pull [15] same as the house no one cannot escape from its vicious force and characters drag through the house's gravity because of their own fear. In other words, the house feeds from the characters' fear.

For humans, darkness has always been a primal fear, associated with the unknown, obscuring sight and potentially hiding any number of dangers. In this way, it can be theorized that the house is everything that cannot be seen or understood [12]. The black hole is the same as the house and unknown to scholars. No one has seen a black hole, but scientists have observed gravitational evidence consistent with predictions about them, so most scientists believe they exist [12]. What lies inside black holes, no matter how hard humans try to theorize about it, is ultimately unknowable. As eminent scholar John Taylor, of King's College, London, puts it:

Ever since humans began to think, we have worshiped that which we cannot understand. As millennia have passed, we have understood an ever-increasing amount about the world around us. ... Yet we are now in a position of facing the ultimate unknowable, which can never be penetrated



as long as we remain in our present physical form. The ultimate unknowable is the black hole. However hard we may struggle, we will never be able to get out of this most fearsome object of the heavens once inside it. Nor can we ever find out what is happening in its interior if we stay outside, fearing to make the one-way trip [5].

Darkness is used as a common symbol to represent the house; Daisy Navidson composes a picture of “several layers of black and cobalt blue crayon, with not even the slightest speck of white showing through,” concerning her teacher greatly [12]. The black hole is matched with the house in the color of black. It is called black because it absorbs all light while it reflects nothing to reveal its presence to human eyes and telescopes [5].

All black holes can create a new universe. The universe may have been borne inside a black hole, and the black holes in our own cosmos might be birthing new universes of their own [16]. Because of the black hole’s ability to create a new universe, it can be considered a womb or female sexual organ for it. The house is the vicious woman who changes and grows over time, makes people crazy, and causes the characters to feel fear and remember their bad memories in the past.

Will Navidson proceeds to measure the house and compare his measurements to the blueprints. The inside measurements are larger than the outer measurements, which is impossible. “The width of the house inside would appear to exceed the width of the house as measured from the outside by 1/4” [2]. The black hole is a resemblance to the house in The Ash Tree Lane. Essentially, a black hole could seem bigger on the “inside” than how it looked to someone outside [7].

Chinese Boxes World. Mise en abyme occurs within a text when there is a reduplication of images or concepts referring to the textual whole. Chinese boxes or Russian dolls are concrete examples of mise en abyme – the outer shell being the full-size real thing, those within a constant referral to the original. Mise en abyme is a play of signifiers within a text, of sub-texts mirroring each other. This mirroring can get to the point where meaning can be rendered unstable and, in this respect, can be seen as part of the process of deconstruction [17].

The prominent commentator on the mise en abyme is Brian McHale. His view is that the ‘mise en abyme unsettles the structure of representation, opening up an epistemological “black hole” that swallows certainty...it induces in the reader a sense of vertigo, of gazing into the abyss’ [18]. The mise en abyme is something small within something larger prompted Werner Wolf to invert this mereological view that mise en abyme may not contain ‘part-to-whole’ but also perhaps, ‘whole-to-part’ relations [18]. ‘Mise en abyme involves the paradoxical reproduction... within the fictional world of the fictional world itself’ [18].

An important term in McHale’s work is the ‘world’. McHale’s focuses on the imaginative universes of the reader’s mind. In ‘postmodernist poetics’ there are “possible” or even ‘impossible’ universes’ for the imagination of the reader [18].

According to Poplawski, our universe may be nested inside a black hole that is itself part of a larger universe. In turn, all the black holes found so far in our universe — from the microscopic to the supermassive — may be doorways into alternate realities. Structure of the Poplawski’s black hole is similar to the concept of mise en abyme that writers present in fiction.

When it comes to the narrative, *House of Leaves* has a Chinese box structure with four layers of narration [4]. At one point during his interview with McCaffery and Gregory, Danielewski remarks that “there are many ways to enter *House of Leaves*” [2]. Assuming that he was referring to the process of reading in his novel, his remark was no understatement. The multitude of parallel narratives that intertwine with each other throughout the novel and there are many ways in which the novel could conceivably be read (See Fig.2) [3].

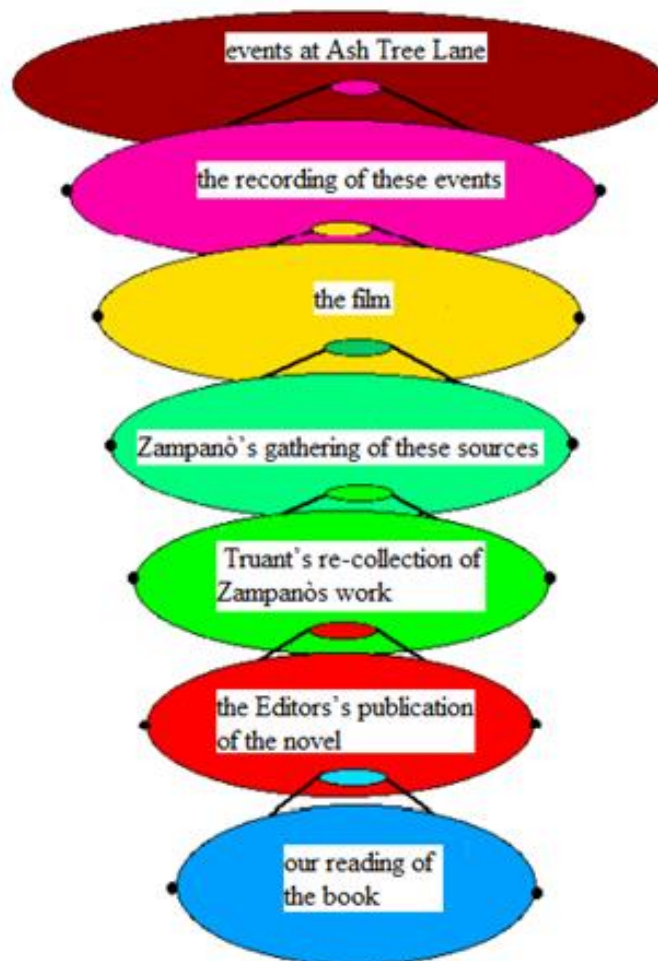


Figure (2) Note. The Chinese box structure of the narrator in *House of Leaves*

All of these narratives are being collected, commented upon and framed by the enigmatic editors of the book. Visualizing all of these stories contained within the same novel leads me to agree with the author as quoted above. The intertwining narratives are almost fighting for the space on the pages: Zampano interrupts his recounting of Navidson’s story to go off on long tangents on the literary and philosophical theory that surrounds it, and Johnny Truant interrupts Zampano to go off on long tangents about his own life [3].

The Novel Is Revealed from the Fourth Dimension

Einstein’s theory of special relativity created a fundamental link between space and time. The universe can be viewed as having three space dimensions — up/down, left/right, forward/backward — and one time dimension. This four-dimensional space is referred to as the space-time continuum [12].

Three-dimensional space is described naturally as a three-dimensional vector space, space-time is viewed as a four-dimensional vector space. The extension from 3-D space to four-dimensional



space-time, therefore, leads to the extension of vectors r with components (x, y, z) to four-dimensional vectors with components (t, x, y, z) , where t is the time coordinate (See Fig.3) [19].

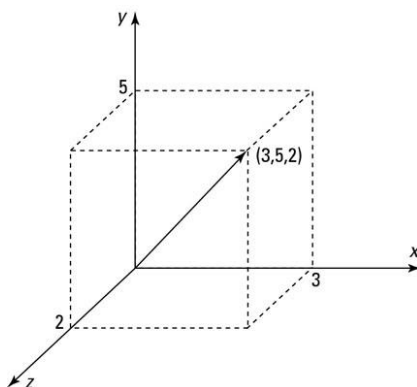


Figure (3) Note. Three-dimensional space

When looking in our world, it has three dimensions — up and down, left and right, back and forth. If you give a longitude, latitude, and an altitude, you can determine any location on Earth, for example [12].

Even though time is a dimension, it's fundamentally different from the space dimensions. Mathematically, you can generally exchange “left” for “up” and end up with results that are fairly consistent. One space like dimension can be exchanged for another, but cannot be exchanged with time like dimension [12].

A line has two “corners” but extending it to a square gives four corners, while a cube has eight corners. By continuing to extend this algebraic relationship, a hypercube would be a four-dimensional object with sixteen corners, and a similar relationship can be used to create analogous objects in additional dimensions [12].

A tesseract is a cube in four-dimensional space. You could also say that it is the 4D analogue of a cube. It is a 4D shape where every face is a cube. A tesseract is a perfectly accurate shape. Similarly, all shapes in higher dimensions, i.e. 5D and 6D, are also mathematically plausible (See Fig.4) [20].

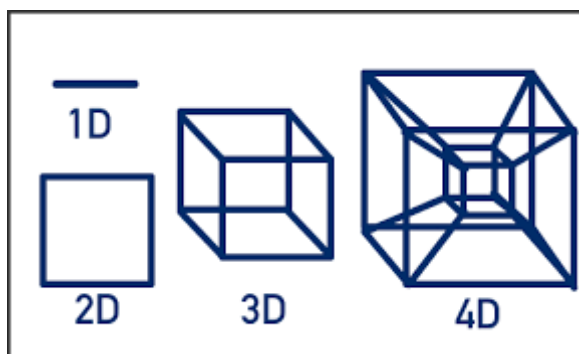


Figure (4) Note. A cube in four-dimensional space



The house in the Ash Tree Lane is a house in a higher dimension. Reston's expert measurements refuse to corroborate what he knows of the physical laws of the universe, and as Navidson explores the house further, he finds that it has a full-blown supernatural dimension: a door that opens onto a labyrinthine hallway complete with ever-shifting chambers, dark stairs that lead down miles into the earth, and possibly even a minotaur-like monster [9].

As it is described the house is dark and infinite space which represents the house may be in the higher dimension and Navidson family experiences of living in the house in the different dimensions from the reader.

The novel's self-interpretation suggests that it has the ontological status of a labyrinth. The visual layout of the cover that depicts perforated maze-walls surrounding the spiraling staircase of the house already conditions our reading and interpretation of the novel as the labyrinth [21].

The labyrinth "appearing" inside of the house may be similar to a portal opening into another dimension [22]. Another reason for being the house in a higher dimension is the physical book. The novel has unconventional uses of page and text layouts [3]. Pages are left blank except for text ranging from a single paragraph to a single word. Text is printed upside-down, sideways and spiraling [3]. Encountering passages such as these causes a reader to rotate the book itself and change its orientation in order to properly read the words printed on the page [3]. Throughout pages 214-238 of Danielewski's novel, a very limited amount of text per page allows the reader to read and turn the pages very quickly, which can allow the sense of tension and urgency in the scene to transfer to the reader through increased reading speed rather than evocative descriptions [3].

All these suggest that Danielewski tries to provide conditions that the reader experiences the feeling of being in a higher dimension. When the reader faces the unusual typography, it comes to his or her mind that the text shines on them from another dimension.

Danielewski begins chapter XX with a quote from Edgar Allen Poe, "No one should brave the underworld alone", and a quotation in Braille format that is translated as follows:

The walls are endlessly bare. Nothing hangs on them, nothing defines them. They are without texture. Even to the keenest eye or most sentient fingertip, they remain unreadable. You will never find a mark there. No trace survives. The walls obliterate everything. They are permanently absolved of all record. Oblique, forever obscure and unwritten. Behold the perfect pantheon of absence [2].

The signs, which are seemed the braille, can be codes for three-dimension and language for communication in the higher dimensional. These dots cannot be understood in physical books and can have another form and shape when seen in the four-dimensional world.

Barton in "Textual Space and Metafiction in Mark Z Danielewski's *House of Leaves*" believes that the braille, which is translated by the editors, acts as another language, one of many that are incorporated into the text such as Latin, French and Old English [2]. Therefore, these dots can be considered codes from higher dimension that the editor translates it into the third dimensional world' language.

Cubism in *House of Leaves* and the Fourth Dimension

Cubism is related to the painting. A group of painters, the most famous of them is Pablo Picasso, who portrayed the objects as geometric shapes. They said that our task is to show the invisible aspects of the objects and see them in all viewpoints. Thus, in a cubist painting, all the visible and the invisible aspects of the object are displayed simultaneously. In cubism, the work transcends the two-dimensional space and enters the fourth dimension (time). For understanding the space-



time in the works of art, it is necessary to walk around the object and look at it from all the points of view and consider it from above, below left and right [23].

In addition to the overall impact of cubism on art in the twentieth century, a movement emerged between the two world wars, known as “literary cubism”. The characteristics of literary cubism are attention to the visual form and the fragmented narrative. These features are reflected in the material characteristics of language, such as the assembled of the sounds, the syllables and the punctuation. Also, the shape of the letters and the words in creating literary cubism are important [24].

The remarkable thing is how the concept of the space-time and the fourth dimension is revealed in the spirit of art and literature. In the early twentieth century, Einstein published the theory of special relativity in 1905. Along with the presentation of this theory, cubism emerged in 1907. Thus, it can be concluded that the scientific achievements at the beginning of the twentieth century have indirectly affected humanism and human beings have been able to communicate to the new concepts and represent the fourth dimension in art and literature. In *House of Leaves*, the primary visual elements such as line and dot, the arrangement of the words and the sentences, the use of the various angles in the arrangement of the sentences and the explanation of the events simultaneously direct the reader to move from the two dimensions to the fourth dimensions.

This novel presents Johnny Truant’s life from childhood to adolescence in one frame. The author has a multi-dimensional view of the life of the main character. In this way, the reader is able to look at Johnny’s life in the assembled view. The difference between the cubism’s painting and *House of Leaves* is that in cubism’s painting, multiple scenes and different viewpoints are combined, but in this novel the events do not overlap and the pages of the book cause the events to shape with the definite boundaries. Danielewski, like the cubist artists who revolved around an object to depict it from the different angles as well as the hidden angles such as the negative dimension of the object, explained Johnny’s life from the different perspectives and shed light on the character’s hidden angles. The explanation of the different aspects of Johnny’s life provided the reader with multiple interpretations of his identity. The various interpretations led to multiple endings for this novel. So, Danielewski seems to have tried to create a reality that is purer and more authentic than everyday reality.

By turning the pages of the novel, the reader separates the events and reads a piece of the past, present or future on each page. *House of Leaves* is not a book that the reader reads line by line to follow the events, but it is a book to turn pages to enjoy visual beauty that each page provides to its reader. In other words, the reader can look at any page like a painting with a hidden story in it. The reader’s journey in the fourth dimension begins from *House of Leaves*’ cover (See Appendix A). Apparently, there is a design of a labyrinth on its cover, but the reader can have another look at this design from another angle. The shape of the spiral can be the shape of the tornado that the viewer looks at it from above like the observer who is miles away from the earth and sees the tornado. The horizontal lines represent what was destroyed and the vertical lines show what survived from the tornado. The cover of the novel foreshadows the reader not to have a traditional view of the novel because *House of Leaves* is the novel of change and presents the unusual and the intangible form of reality for its audience.

There are lost and burnt resources parts in the novel that Johnny defines them with the capital Xs (See Appendix B). At first glance, there is density of Xs next to each other. If we take the book close to our eyes and look at it from the corner of Xs, the labyrinth will appear. In fact, the author, like the cubist painter, wanted to show the audience a multi-dimensional truth. The Cubist painter creates a multi-dimensional truth with the brush and the different colors, but the postmodern writer uses the material features of the language. By repeating the letters, the language is displayed as an



object on paper and the text becomes embossed. In this case, the novel asks the reader to see the text instead of reading it. In *House of Leaves*, the materiality of language is challenged in its classical sense and the novel can be considered a book outside of this world, which presents reality from another dimension. Another example of embossed language on the paper is in the third chapter which begins with these sentences: “why Navidson? Why not someone else?” [2] At the beginning of the chapter, there is apart from the Old Testament that Moses asked God why he went to Pharaoh and in another part, there is a quotation from Dante repeated the phrase, “Why should I go there?” [2] And the end of the chapter finished with these sentences “why Navidson? Why not someone else?” [2] The question of why assembles in different parts of this chapter by using different languages and quotes from other books.

On page 233, the words are randomly scattered on the page. Like a painter who picks up his or her brush to create a few stains on the paper with a sudden shake. The reader can create new sentences by choosing each word on this page, so multiple meanings can be inferred from this page (See Appendix C).

On page 232, words are grouped like a bullet to describe a bullet (See Appendix D). On pages 237 and 238, the words are separated by a short sentence that says, “The room saturated with silence.” After that this silence is conveyed by seven pages which are blank with some short sentences. As mentioned earlier, *House of Leaves* is not a book to understand meanings by reading, but it is a book to see each page like painting for understanding meanings.

In chapter twelve, Will Navidson gets stuck at the bottom of the stairs. When he wants to reach the rope to escape from the labyrinth, the stairs are pulled and the rope is torn and he stays in the labyrinth without any hope. On page 289, the author displays this scene with a vocabulary arrangement (See Appendix E). On this page, the words are upside down and the word “Navidson” is written at the bottom of the page. If we turn the book over, the word “stretching” is written vertically with distance in which the perspective is observed and as the words get closer to the top of the page, become smaller and there are short distances between them. The reader visually understands the state of the stairs from a horizontal point of view. It is seen the word “expanding” like the stairs which are twisted and extended to the downwards. As much as the stairs go to the depth of the earth the letters become smaller to show the reader the depth. Eventually, Reston pulls the rope, but the rope breaks. On page 291, the word “dragging” is written vertically and Reston is written at the end of “dragging” so that the reader can see this scene with the arrangement of the words (See Appendix F).

On page 110 of the book, we come across an intangible written format. The sentences, the structure and the syntax of the sentences are broken and the sentences are underlined. In each part of the novel, when it is seen this similar structure, there is a similar story: the story of the King Minos and the labyrinth. On page 110, the text is like a broken the bust which the reader sees only its head and can find its neck on the next page. In the following pages, this structure is repeated in the form of short sentences, as if the broken parts of the bust have been distributed in the different pages of the novel. As mentioned, the difference between *House of Leaves* and the cubism painting is that the events did not overlap in the novel. It seems that the author asked the reader to look at the various angles of this bust in different parts of the novel (See Appendix G).

From pages 119 to the end of page 145, a new format in the novel appears. In all pages, it can be seen as a square box in a specific part of the page (See Appendix H). Chapter nine is about Will and his companions in the labyrinth. They have been lost there for eight days. In semiotics, the square is considered as compass and stillness [25]. On all these pages, the sentences in the box on the left page mirror on the right page. The writer mirrors the sentence to ask the reader to look at the shape of written language from different angles. If we take a look at these pages from the fourth



dimension it is felt the sense of loneliness of characters in the story by the arrangement of sentences. A compass that shows no direction is still standing is inferred from square boxes. Even if we move the compass, its hands do not show anything. This feeling is transferred to the reader by mirrored, upside down and rotated sentences.

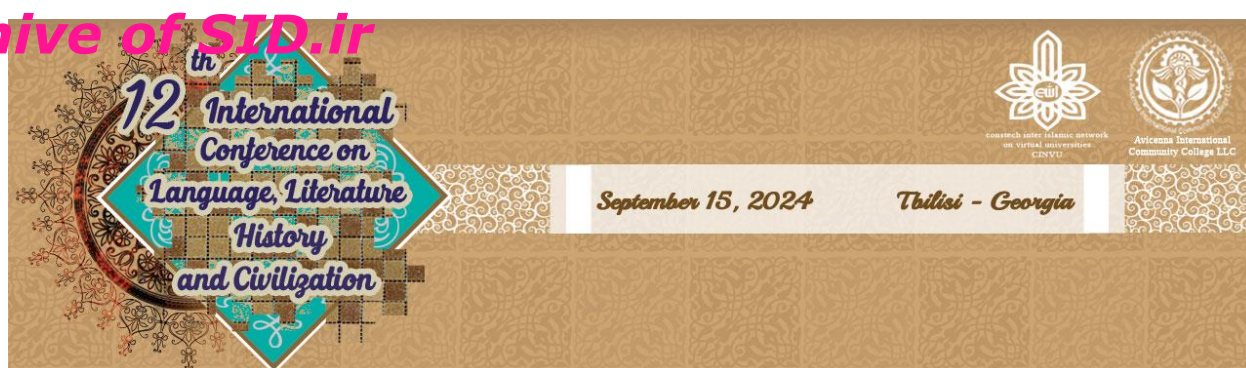
On page 421, there is the absent photo in the parentheses called Delial (See Appendix I). What a photograph shows to its audience is a frozen frame of the past. A photo is a definite affirmation of the past and evidence of one presence. With the birth of photography, it provided the presence of the past tense in the present tense. The photograph links the present tense to the past tense. The fourth dimension is the link between past, present and future. The question is, what does a photo look like in the fourth dimension? The photograph is a combination of the past with the present and the future is absent there. If we compare the photograph to a telescope, we find out that it is seen an event from millions of years ago and perhaps the star we are looking at has been dead for ages. But when we look at the universe from a higher dimension, does that star have the same shape? In fact, in the fourth dimension, we see the whole life of the star together (from before its life to after its life). So, if we have a look at a photograph from the fourth dimension, we will see that frozen events will come out from the frame and join to its past, present and future in order to the unity of time happen. Because the events in *House of Leaves* did not overlap, we are confronted with a missing photo on the page, which has been come out from its past. For seeing this photo, the reader has to search the past, present and future of the photo through the pages in the form of language.

Conclusion

This research is disciplinary research which is read *House of Leaves* in the light of modern physics. It shows the new scientific discoveries in the twentieth-century indirectly have affected literature. In parallel to modern physics, postmodern literature is developed and these two different fields of study meet each other and overlap their characteristics. In the novel, the reality of the characters in the novel depended on someone to read them. The character's existence lay in superposition and when the observer looked at one of these possibilities, the reality appeared to him or her. According to the participatory anthropic principle, human beings had a privileged position within the universe. The universe existed because the human being was here to observe it. The privileged function of the reader was similar to this theory and the presence of the reader gave meaning to the reality of the character. The similarities of this theory and postmodernism features showed how physics communicated with humanism and reincarnates as metafiction in literature.

In the next part, a simile was used for the house in the Ash Tree Lane. The black hole was similar to the house because of their common characteristics. Their size, darkness and the force for the destruction of everything were the features which showed their identical nature.

Mise en abyme occurred within a text when there was a reduplication of images or concepts referring to the textual whole. *House of Leaves* had mise en abyme structure and the novel was the story within the story. The Poplawski's black hole was similar to the concept of mise en abyme that the writer presented in fiction. Poplawski believed that black holes were a place of birth in the new universe. In fact, our universe was inside of a black hole and the black hole in our universe created another universe. This comparison was studied in chapter four and it was shown how Poplawski's theory linked to the literature and scientific theory and humanism affected each other. The last part of this research tracked the signs of a higher dimension in *House of Leaves*. The strange house, which was described in the novel, had features of the cube in a higher dimension. It was indefinite space and the labyrinth "appearing" inside of the house may be similar to a portal opening into another dimension. Another reason for being the house in a higher dimension was the



physical book. The novel had unconventional uses of page and text layouts. Pages were left blank except for text ranging from a single paragraph to a single word. The text was printed upside-down, sideways and spiraling. These things could be a reason that the reader read the book which belonged to another dimension and seemed unusual for the three-dimensional world.

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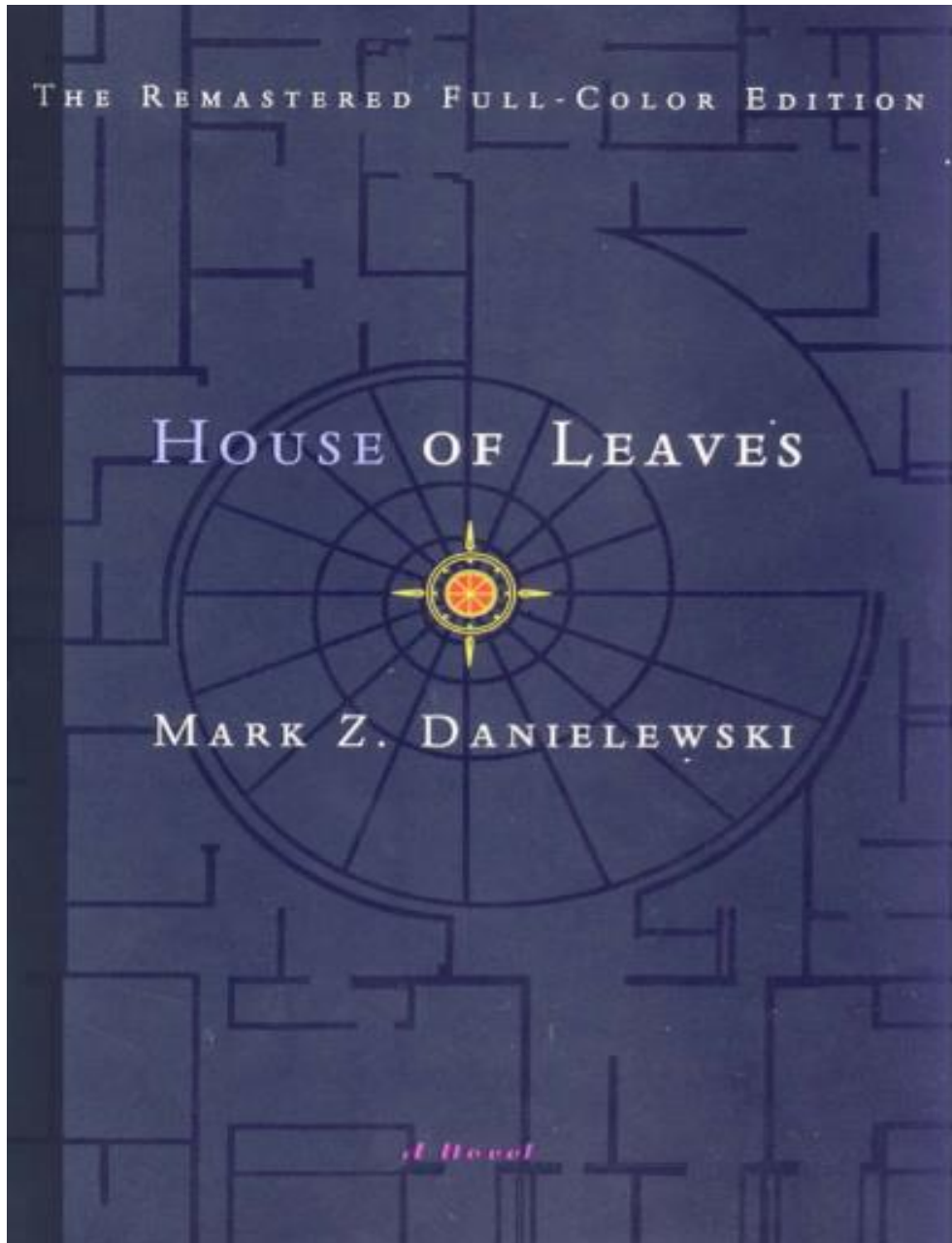


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Appendices

Appendix A





Appendix B

edge no one ever has. I think there's a very simple reason too: people understand, consciously or unconsciously, that it really isn't empty at all.⁴¹⁴

Leffler's point is simply that while Navidson does not physically appear in the frame he still occupies the right side of the photograph. The emptiness there is merely a gnomonic representation of both his presence and influence, challenging the predator for a helpless prize epitomized by the flightless wings of a dying child's shoulder blades.

Perhaps this is why any observer will feel a slight adrenal rush when pondering the picture. Though they probably assume subject matter is the key to their reaction, the real cause is the way the balance of objects within the frame involves the beholder. It instantly makes a participant out of any witness.

Though this is still all dark work, at least one aspect of the photograph's composition may have had direct political consequences: Delial is not exactly in the centre. She is closer to Navidson, and hence to the observer, by a hair. Many experts attribute this slight imbalance to the large outpouring of national support and the creation of several relief programs which followed the publication of the photograph. As Susan Sontag sadly mused many years later: "Her proximity suggested to us that Delial was still within our reach."⁴¹⁵

See diagram:

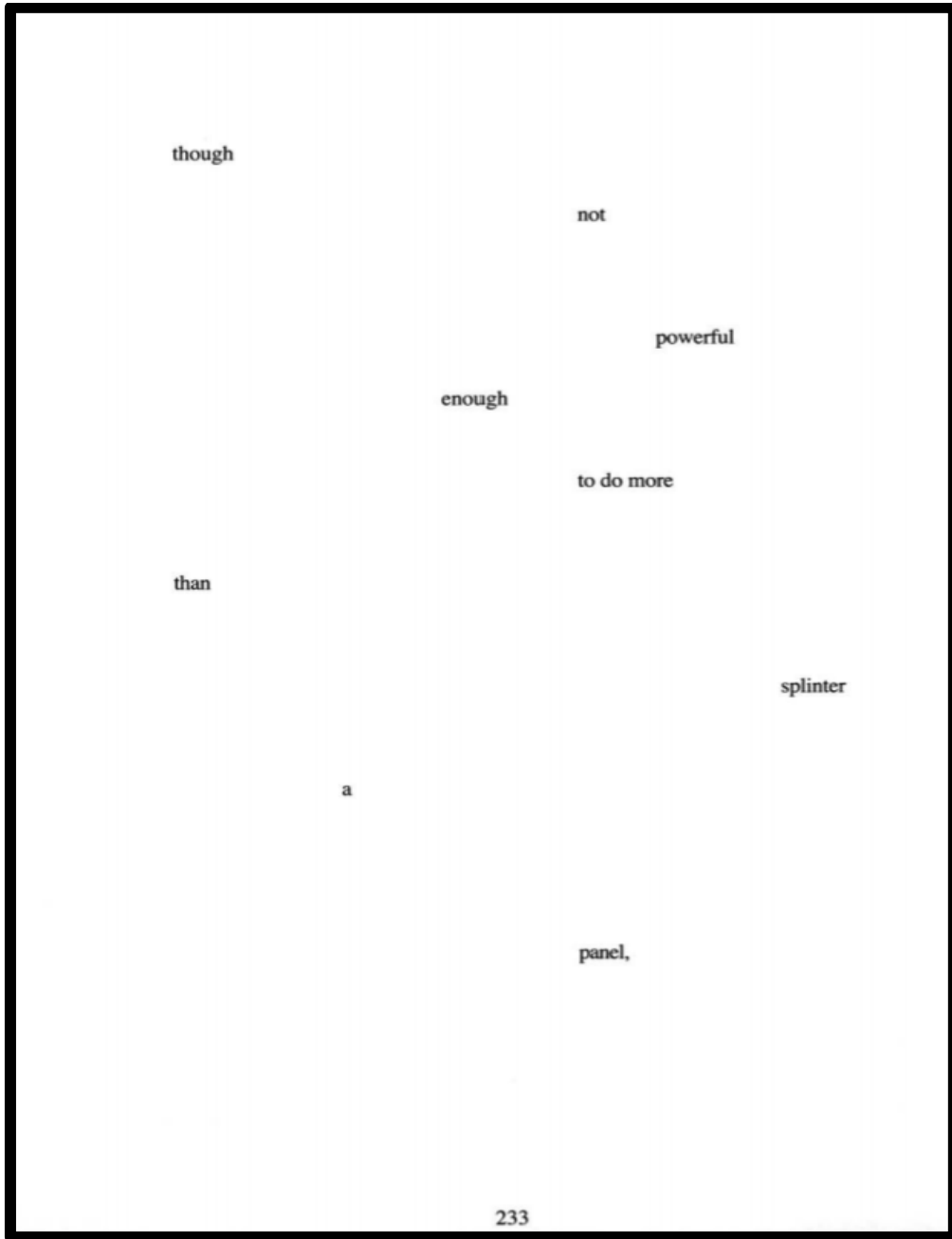
416

⁴¹⁴Rouhollah W. Leffler's "Art Times" in *Sight and Sound*, November 1996, p. 39.
⁴¹⁵Susan Sontag's *On Photography: The Revised Edition* (New York: Anchor Books, 1996), p. 394.
⁴¹⁶Presumably Zampanò's blindness prevented him from providing an actual diagram of the Delial photograph. — Ed.

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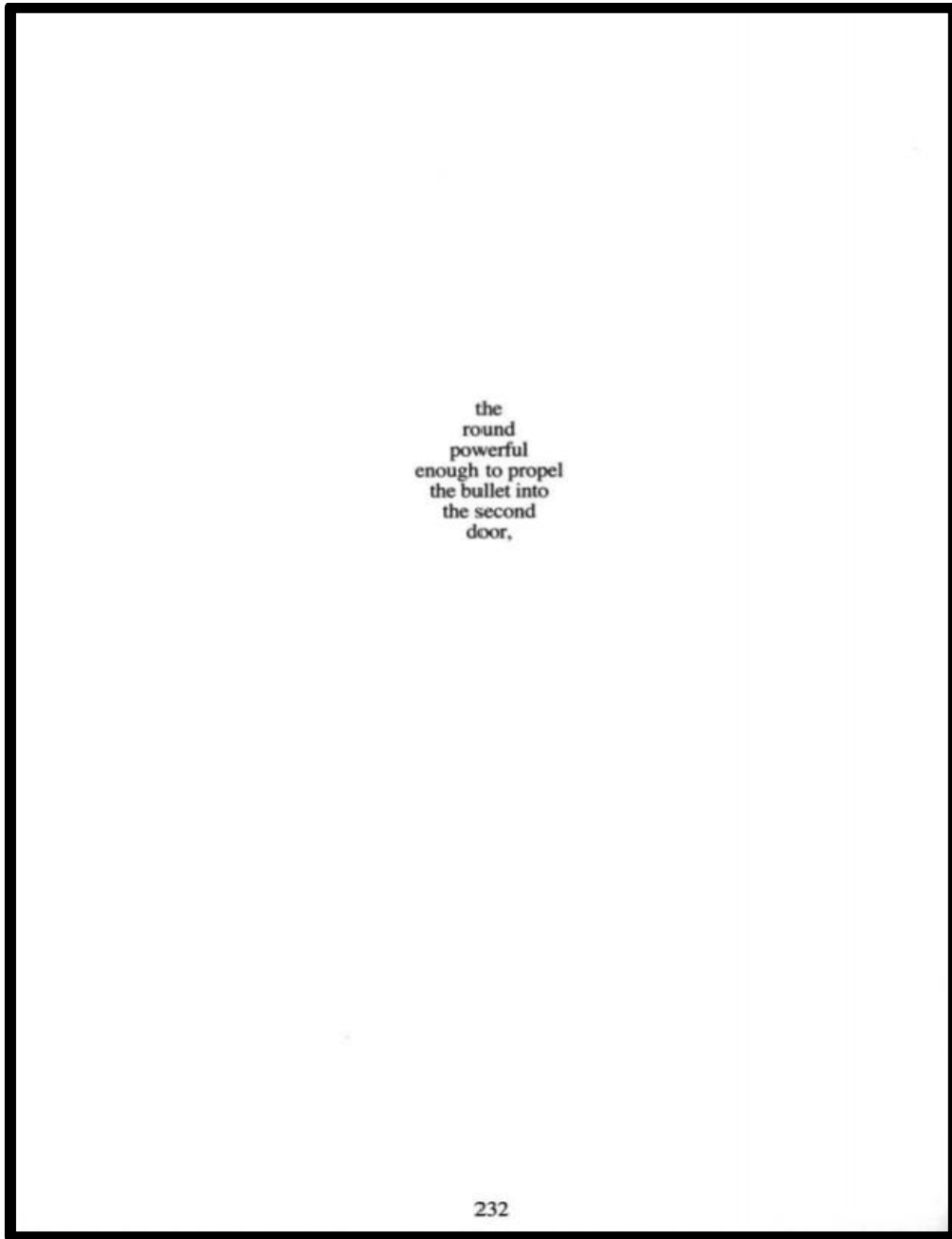


Appendix C



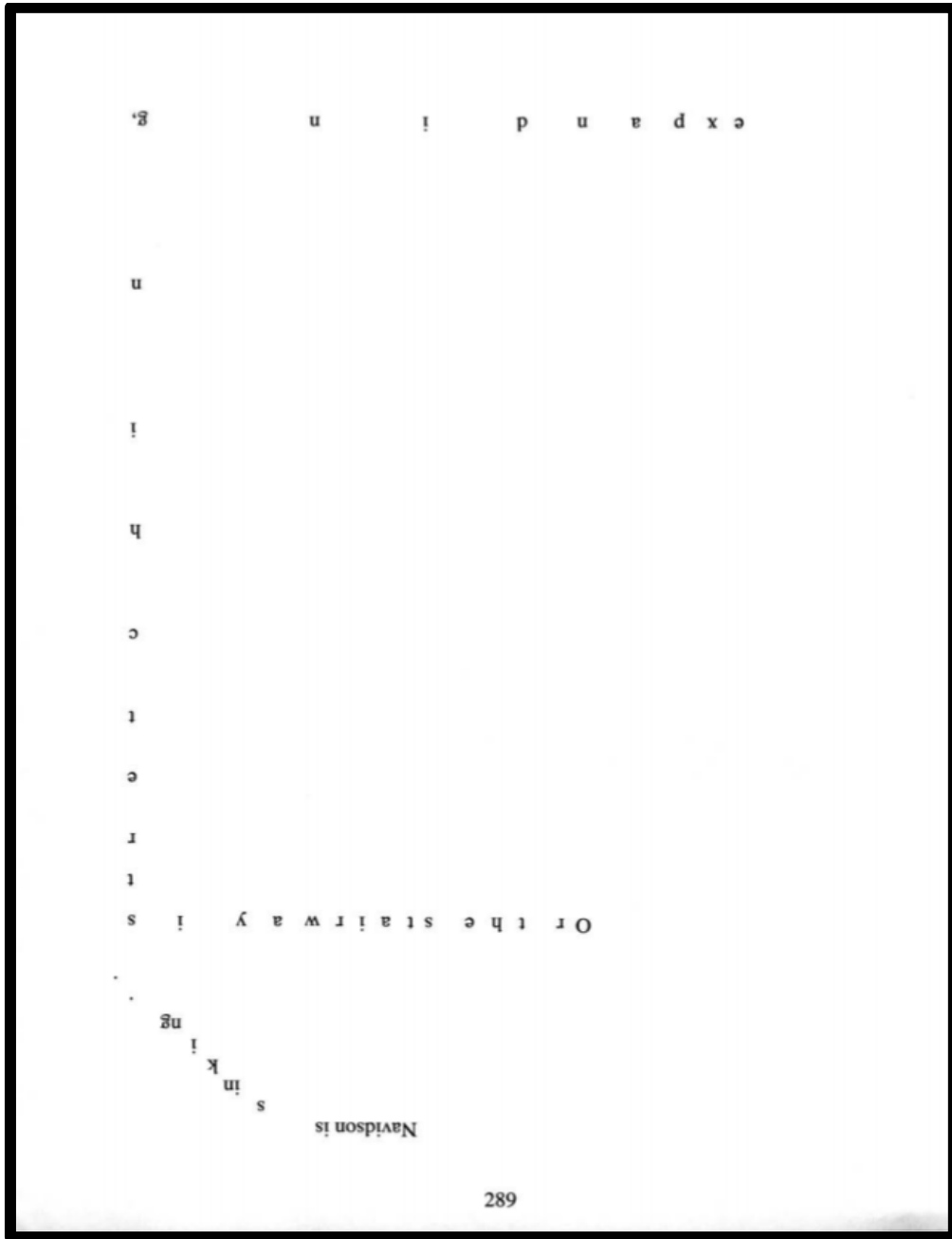


Appendix D



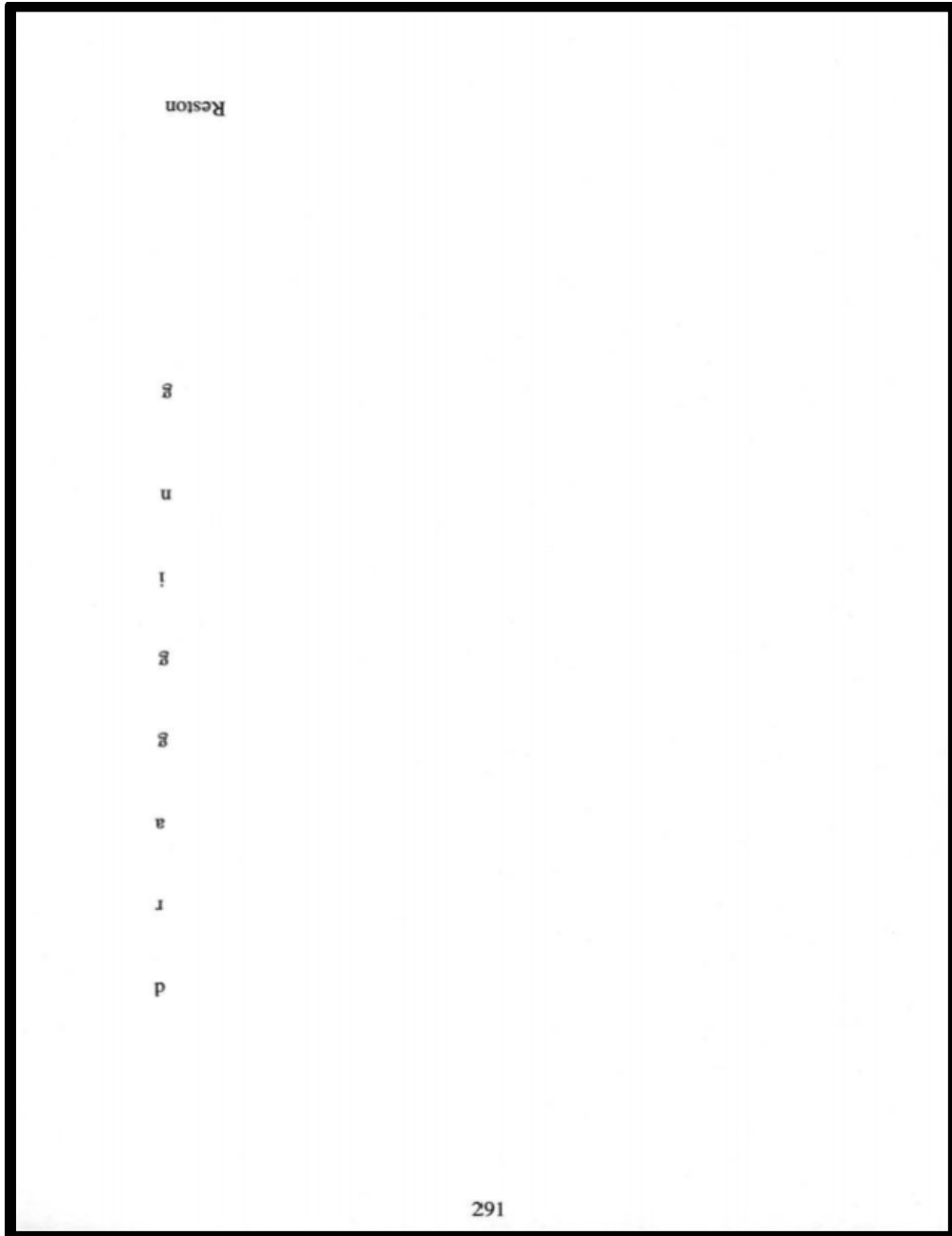


Appendix E

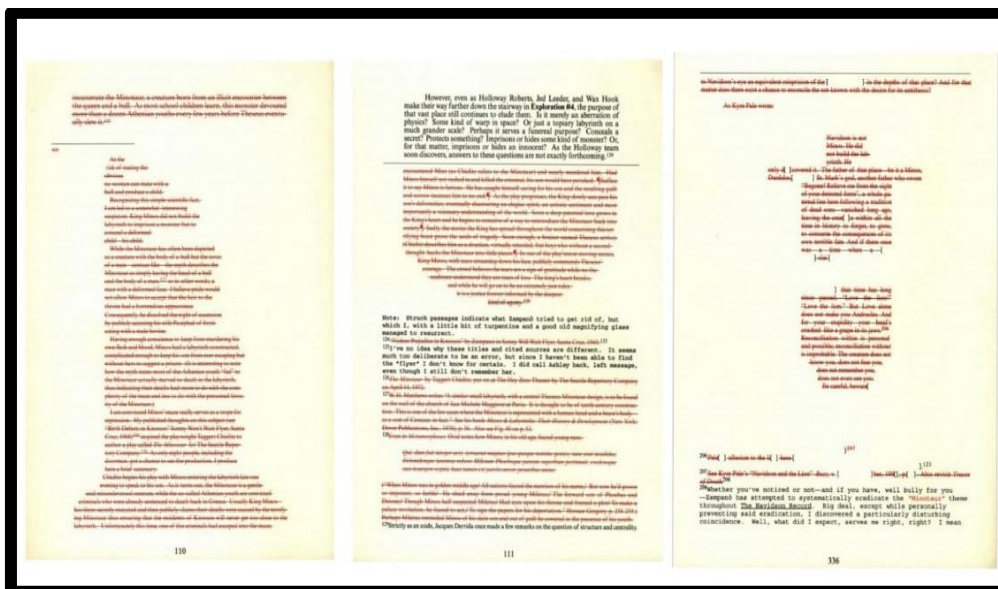




Appendix F



Appendix G



Appendix H

