Science and art in flux| The interaction between chaos theory and Alain Robbe-Grillet's early novels

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SCIENCE AND ART IN FLUX:
THE INTERACTION BETWEEN CHAOS THEORY
AND ALAIN ROBBE-GRILLET'S EARLY NOVELS.

by

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Chairperson

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Science and Art have interacted throughout human history to create both innovative technologies and aesthetically pleasing works of art. Often, it is an aesthetic motivation that encourages humans to make contact with their universe, and the artistic venue, then, becomes a universal laboratory that both chronicles and precipitates scientific advances. Using this frame of reference, one can treat a succession of works of art as a continuous historical record that documents the ongoing interaction between Man and the universe.

Alain Robbe-Grillet, who began his artistic career as a French New Novelist in the 1950s, was initially trained as a biological agronomist. His early novels, therefore, represent an interdisciplinary point of view that synthesizes artistic and scientific aesthetics. This thesis investigates some aspects of 20th century science and mathematics that influenced Robbe-Grillet’s narrative structures and general theory of the novel. Put in the context of continuing the rupture with 19th century bourgeois ideology, it addresses specifically the interaction that Robbe-Grillet’s novels have with the shift in philosophy and aesthetics proposed by chaos theory.

Chapter I provides background information on the relationship between Science and Art and defines the aesthetic shift proposed by chaos theory.

Chapter II takes aspects of 20th century scientific and mathematical theory such as Relativity, Quantum Physics and Gödel’s Incompleteness Theorems and relates them to Robbe-Grillet’s treatment of metaphor, characterization, ideology, chronology and causality.

Chapter III analyzes the underlying structures in Robbe-Grillet’s novels and traces the evolution of the artistic device *mise en abyme* from its historical use to its *fractalization* in the New Novel. An investigation of Robbe-Grillet’s interior duplications relate the quincunx, the arabesque, and fractals to narrative structures in his early novels.

Chapter IV treats the interaction between order and disorder in *La jalousie* and shows how Robbe-Grillet embedded *pôles organisateurs* in the text that resemble the “strange attractors” of chaos theory.
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Chapter I

Preliminary information on the relationship between Science and Art and the introduction of a “fractal aesthetic.”

The Nouveau Roman, which began in the 1950s, was a loosely defined “school” whose participants attempted to find an innovative voice for the novel. In renouncing (or evolving beyond) accepted forms of narrative structure, point of view and chronology these novelists created a scandal by openly renouncing the traditional (and, by their account, petrified) novelistic devices pioneered in the psychological novel beginning with La princesse de Clèves. They were not trying to revolutionize the novel because preceding works lacked artistic merit, but because of the prevailing view that the modern novelist was judged by the reactionary notion that he must recreate a balzacian style to be considered a writer of value.

The French New Novelists accelerated the rupture in the fabric of the narrative that had begun to tear with Flaubert and continued to evolve away from traditional stylistic devices with such writers as Gide, Proust, Faulkner, Kafka and Joyce. There was heady talk on the part of the adherents to the school of altering the relationship of man to his world through art and of saving the novel-as-art from its own death-by-redundancy.
The scandal in both the academic and popular criticism of the time was that these novelists chose to take on this enterprise systematically and self-consciously. Perhaps the most out-spoken, extreme, and scientific in his approach was Alain Robbe-Grillet. His early published work, from Les gommes to Dans le labyrinthe, before his transition to cinéaste, is comprised of novels that become systematically more extreme in their scientific prose. It is well known that before he undertook the problem of writing novels, Robbe-Grillet was trained as a biological agronomist. The scientific aesthetic that resulted from his initial formation is the major theme in his earliest work. The role of science in the novels of Robbe-Grillet lies at the heart of his entire enterprise. From the structure of his novels to the (counter)ideology that was the driving force behind them, an exacting mathematical and scientific point of view was prevalent. He later defended the scientific style in his books to critics who mistook the presence of science in modern literature for a frigid, overly-objective, and anti-humanist point of view (Jost, ed., 88). Robbe-Grillet’s aesthetic has many similarities to the aesthetic proposed by twentieth-century mathematics and science, and this similarity verifies the continuous interaction between Science and Art.

Science and Art have always been engaged in a fertile interplay, and in the modern age it is no longer a revelation that there is a deep
The popularity of science fiction (from Jules Verne to William Gibson) and the universal appreciation of beautiful computer-produced fractal images are only the most modern manifestations of the interaction between these two disciplines. Artist-scientist-innovators such as Leonardo da Vinci possessed an understanding of the universe that transcended the realm of knowledge current during their lifetime.

Long before da Vinci, when humans were first shaping metal, clay and stone, the aesthetic motivation to create decorative objects with no utilitarian justification (jewelry and religious objects) often preceded and gave way to the production of tools and weapons. "The dominance of aesthetic motivation" in the creation of technologies is historically exemplified in many scientific advances. Some striking examples of this phenomenon are the presence of cultivated flowers in Neanderthal graves preceding a developed food supply-based agriculture, the fact that fire-hardened ceramic figurines preceded useful pots in many Middle Eastern archeological sites, and that the use of explosives in China as fireworks preceded their use as a destructive weapon. The artistic venue then,

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1A Search for Structure by Cyril Stanley Smith provides an account of the earliest interaction between art and technology. Interested by the fact that he was having to go to museums to research the structure of early metallurgy, he began to investigate the rich history that Science and Art have in common. See in particular the essay "Art, Technology, and Science."
starting with many of the first technological advances, was the training ground in which humans had first contact with the shaping of the properties in their universe. A more modern, conceptual example of this phenomenon is that some of Piet Mondrian’s paintings were later found to have almost exactly matched the microstructures of some cubic crystals containing randomly nucleated plates of a precipitated phase growing at right angles to each other until interference (Smith 232).

According to the archaeological record, it is often the innate human drive to create art that causes the initial analysis of the universe that then allows for scientific and technological development (Smith 195-203).

In view of these ideas, one can posit two statements about the relationship between Art and Science: a) Science and Art have a symbiotic relationship that has always been in flux. The two fields evolve together in a loop, giving and taking from each other in subtle ways, each discipline adopting the innovations of the other, only to return the concept to the other discipline in mutated or evolved forms; b) Science and Art evolve together in the broader cultural context, both of them in a loop with similar cultural forces. This interaction between the two fields and society enables us to look at a work of art as a historical object. A historic analysis of the technical and structural aspects of Art often reveals the level of skill and knowledge that Man has in the interaction with his universe at that time.
The scientific aesthetic present in Robbe-Grillet's cannon and the re-evaluation of the universe proposed by the recent field of complexity theory (a.k.a. chaos theory) are firmly entrenched in both of the above-described loops. Therefore, Robbe-Grillet's art can be sampled to reveal the relationship between his narrative structures and the shift in aesthetic proposed by chaos theory.

Before a broad explanation of complexity theory can be given, a disclaimer is necessary to qualify the goals of this thesis. As N. Katherine Hayles points out in her texts linking chaos theory and literature, the mere use of the term "chaos" is a good indication that the writer is a dilettante and that there will not be much in the way of hard science or mathematics to follow.² Incorporating mathematics into literary criticism is viewed as suspect in both the mathematical and literary genres. This thesis will attempt to dispel the notion that there is no correspondence between the two disciplines.

Although the actual practitioners of the discipline use "complexity theory," "non-linear dynamics," or "dynamical systems theory" to describe the field, the terms "chaos" and "chaos theory" will be used here as umbrella terms because of their broad scope and their acceptance in the

² see Hayles' *Chaos Bound: Orderly Disorder in Contemporary Literature and Science.*
popular imagination (Hayles 8). The description of chaos theory herein will be simplistic and relatively non-scientific. This thesis is more interested in the philosophy and the broader aesthetic proposed by chaos theory rather than hard mathematical research. Simpler still, I will treat specifically the elements of chaos theory that apply to narrative structures and themes present in the work of Alain Robbe-Grillet.

The seeds of chaos theory were planted between 1875 and 1925 by mathematicians who proved that the previously established laws of mathematics were not as unshakable or as fixed as had been suspected. Peano curves, Koch islands, Cantor dust, Cantor’s set theory, Brownian motion, Fournier universes and other constructs were considered “a gallery of monsters” because they introduced the study of “irregular continua” and infinity where the laws of linear mathematics were no longer sufficient (Mandelbrot 9). Although these “pathological” structures created a rupture in the traditional world view and are therefore seen as the beginning of modern mathematics, they were largely ignored or left unresolved until the 1970s when high-powered computers and a new approach pulled them out of obscurity. The pioneer of modern mathematics most responsible for converting this “gallery of monsters” into a “Mathematical Art Museum” is the French mathematician Benoit Mandelbrot. In his seminal text *The Fractal Geometry of Nature*, he describes a then-budding field that
attempted to incorporate geometry into the shifting, non-linear and unpredictable domain of Nature. A summary of that text will serve as a primer for a fractal-based aesthetic.

Mandelbrot makes the connection immediately between certain visual arts (painting and architecture) and the aesthetically pleasing forms and shapes that he encountered while analyzing patterns he identifies as fractals. For example, da Vinci’s studies on water and hydraulics represent some of the first representations of fractals in art in that they “depict water flow as the superposition of eddies of many diverse sizes . . .” and represent “. . . the ‘scaling’ view of the nature of turbulence” (279). This scaling or self-similar device and a tension between the microcosm and the macrocosm are central themes to the scientific aesthetic of Robbe-Grillet and will be discussed at length below. He also notes that “all graphical representations of mathematical concepts are a form of art,” and specifically identifies simple or “minimalist” abstract art as having a close tie to fractal geometry (23). The minimalist abstract art of Piet Mondrian, the geometrical art of M.C. Escher and the ancient patterns of the Arabesque fall under the rubric of Art that is bound to mathematical forms.

A mathematics based on fractals presents a departure from definite Euclidean geometry and precise Newtonian physics in that it explores dynamical systems whose unpredictable outcomes are the result of slight
changes in initial circumstances. Whereas

Euclid begins with the simplest shapes, such as lines, planes, or spaces. And the simplest physics arises when some quantity such as density, temperature, pressure, or velocity is distributed in a homogeneous manner (18),

fractal geometry, and by extension chaos theory, attempt to understand the infinite factors that create complex, unpredictable systems such as the weather, the stock market or turbulent flow.

The Mandelbrot-coined term “fractal” is central to the notion of chaos and dynamical systems. It comes from the Latin adjective fractus and its corresponding latin verb frangere, the meaning of which implies to break or create irregular fragments (4). Fractals identify a family of shapes whose creation often involves chance and whose regularity and irregularity are often statistical. Also central to the idea of fractal is the notion of scaling (also known as recursive symmetry or self-similarity). These terms suggest that the degree of a fractal’s “irregularity and/or fragmentation is identical at all scales” or at least across a broad range of scales; that is to say that there exists a uniformity of dimension and shape between the microcosm and the macrocosm as one observes deeper and deeper structures (1). The symmetry of a fractal unfolds not on a single plane, as is the case with a bilaterally symmetrical object such as a Greek temple, but along different interior scales.
The simplest way to illustrate a fractal structure, and the reevaluation of our universe that it implies, is to ask the question that Mandelbrot first posed: “How long is the coast of Britain?” (25). This question is deceivingly simple, but in trying to answer the query, traditional Euclidean geometry is proven to be flawed in its ability to truly define the borders and shapes that surround us in Nature. If a coastline were a simple rectifiable shape such as a circle or a rectangle, we would have no trouble getting an accurate measurement with a ruler of any length. The problem stems from the inadequacy of the anthropocentric and linear tool of measurement (the ruler) to accurately assess an object that in reality is a curve without a tangent.

If the coast of Britain were measured by the “divider method” (number of linear steps, each of fixed length, multiplied by the step length) and the step length was, say, one kilometer, it would yield length x. If we then made a second measurement using a smaller increment or step length such as one meter, the length estimate would be vastly larger than the initial estimate x. To use centimeters, millimeters, and then a ruler the size of one molecule would yield increasingly larger and larger mensurations. As the unit of measurement decreases, the length of the coastline increases until one is able to conclude that, although bound, the coastline of Britain is
potentially infinite (25-30).³

This phenomenon occurs because the coastline is self-similar in that a loop can be decomposed into the union of other loops (44). More specifically:

When a bay or peninsula noticed on a map scaled to 1/100,000 is reexamined on a map at 1/10,000, subbays and subpeninsulas become visible. On a 1/1,000 scale map, sub-subbays and sub-subpeninsulas appear, and so forth. (26)

Two important notions arise from an investigation of the fractal dimension of a coastline: a) a fractal tends to contain an interior infinity that is uncovered through continual magnification; and b) a fractal exhibits self-similarity in that the same shapes or themes appear continuously, albeit with variations, throughout the various levels of the microcosm. Some naturally occurring examples of fractal forms are trees, rivers, lightning, the circulatory system, cauliflower, snowflakes, the pattern of fallen leaves on the forest floor, frost on a window, and lava flows; our universe is made up of fractals.

³ When matter is reduced to pure form at the atomic level, and the whole concept of length is non-existent, this self-similar scaling process theoretically comes to an end. However, we can still say that the coastline is potentially infinite because it is possible that even atoms are divisible into an infinity of parts. Whether this theoretic infinite divisibility represents a potential infinity or an actual infinity has yet to be resolved. See the “Infinities in the Small” section of Rucker’s Infinity and the Mind for an analysis of this problem.
While fractals abound in Nature, some of the most mathematically complex examples arise when dynamical systems are plotted on the complex number line of a computer. A dynamical system is defined as any system that changes over time. Some dynamical systems, such as the movement of the planets around the sun or certain chemical reactions are considered to be stable systems in that their outcomes are predictable.\footnote{However, this is a matter of temporal scale. In the case of chemical reactions that appear to be stable, it is possible that the reaction is composed of numerous smaller chaotic reactions that resolve themselves into a stable system over time. The planets in our solar system appear to have stable behavior according to our limited time frame, but one can imagine that outside of our temporal frame the system is actually unstable and chaotic.} Other dynamical systems are considered to be chaotic in that their outcome or the result of their change is unpredictable.

Chaotic dynamical systems usually contain a sensitivity to any large number of initial factors that render a precise calculation of the system impossible. An example of a chaotic dynamical system is the weather. At any given moment, an infinite number of factors are responsible for the weather patterns in a given area. The whole system is a continuous cycle that is interconnected with every portion of the earth’s atmosphere. The general inaccuracy of weather forecasting highlights the impossibility of bringing a chaotic dynamical system into the realm of predictability or
human understanding. Meteorologists come in daily contact with chaos when they attempt to predict the weather by using non-linear computer models of the system. In programming the initial data, they find that a small fluctuation in input can explode over a relatively short time into a drastically different result. This phenomenon exhibits one of a chaotic dynamical system's main precepts: that a small change in initial circumstances on the level of the microcosm can feedback and reverberate into an extraordinarily different result in the macrocosm. A meteorologist might run a computer model entering in air temperature at 58 degrees fahrenheit and achieve a forecast of sunny skies. If he then ran the model again using all the same data but changed the air temperature to 58.1 degrees fahrenheit, the computer might forecast a tropical storm thus rendering the prediction unreliable. The mapping of this phenomenon onto the weather system suggests that something as small as my belly-flop off of a pier into the water near Santa Cruz could feedback and cause a typhoon in Indonesia. That many aspects of the weather such as clouds, turbulent flow, lightning, and snowflakes are fractal shapes draws a connection between fractals and dynamical systems. A fractal shape calls into question the ability of human beings to accurately measure or predict the outcome of a dynamical system.

While the weather is a chaotic dynamical system with an infinite
number of variables, very simple systems that have only one or two variables can also produce random and unpredictable results (Peitgen, ed., 138-139). Gaston Julia was a French mathematician who in the 1920s was one of the first to experiment with sets whose results are random. The value of Julia sets was not fully appreciated until the ability to plot their orbits on the complex number line of a computer pulled them out of relative obscurity and produced the fractal images that many people associate with chaos theory.\(^5\)

These images are produced when a Julia set is iterated and plotted on the complex number plane. The process of iteration means to repeat an equation over and over again by plugging the result of an equation back into the beginning of the equation. A simple example of iteration is demonstrated by a calculator. If we input any number and then repeatedly press the “\(\sqrt{\cdot}\) button we are iterating the square root function. The orbit of the square root function is said to be stable because, regardless of the number with which we choose to start, the result of iteration will always tend toward “1”.

When the computer scientist wishes to create an image of the random orbits of a Julia set under iteration, he first chooses a grid on the complex plane.

\(^5\) see Robert L. Devaney’s videocassette *Chaos Fractals and Dynamics* for an introduction to computer generated fractal images.
number plane on the screen of a computer. A computer screen is composed of small, evenly spaced points called pixels. An image is created when pixels are activated (made to glow) in a certain pattern by a scanning beam of electrons. Each number on the grid is represented by a pixel on the computer screen. Every number, when iterated, exhibits different orbiting behavior; some orbits in the set are stable while others veer off randomly toward infinity at different rates. The computer scientist assigns a color to each set of an orbit’s behaviors exhibited by the set. If a number’s orbit remains stable inside the grid of complex numbers then its pixel is painted black. If a number’s orbit tumbles rapidly into infinity and chaos then its pixel painted another color and so on until each quality of orbiting is assigned a corresponding color.

The resulting image is striking in its fractal complexity in that it is self-similar and infinite. If the grid of complex numbers represents the values between, say, 1 and 2 then it is possible to “magnify” or zoom in on the fractal images by iterating the infinity of numbers that exist on the plane between 1 and 2. As we continuously zoom in on the fractal image, the same shapes and patterns appear on every level of the microcosm. (see Fig. 1.1)

The highly complex shapes that appear on the boundary area between the stable black orbits and the chaotic colored orbits in a Julia or
Mandelbrot set are known as "strange attractors." A strange attractor is a "mathematical object which, even today, defies mathematical analysis" (Peitgen, ed., 147). While analyzing the plots of chaotic dynamical systems in phase space (that is to say a space that does not exist in physical three-dimensional space, but in the interaction of variables in a system changing over time), researchers find that even chaos has a deep structure in which it takes on an organization of its own. The paradox here is that while a system’s orbits are described as chaotic, there is a space that all of the orbits of the system are mysteriously "attracted" to. In this way, a strange attractor sits at the boundary between order and disorder. It represents an area that is simultaneously random and organized.

Some brief conclusions can be drawn about the philosophy and aesthetic that chaos theory proposes. First, it recognizes that Nature and society appear to be made up of chaotic dynamical systems that change over time. Second, it suggests that these systems, while chaotic, also have an underlying order that can often be plotted in phase space and visualized in the form of a strange attractor. Third, when chaos is plotted the image is fractal in that it exhibits both self-similarity on many scales and a potential interior infinity. Fourth, the fractal aesthetic shows that traditional, linear, and anthropocentric sciences such as Newtonian physics and Euclidean geometry have a limited scope because of their ability to describe the chaos
and non-linearity that exists in Nature.

Chaos theory attempts to describe certain phenomena that occur in complex dynamical systems that had previously been largely ignored by modern mathematics and science. Since the universe is perceived to be composed of dynamical systems, it would appear that chaos theory advances our knowledge one more step in describing Nature on its own terms. Our frame of reference has changed to incorporate aspects of Nature that are nonlinear and sensitive to initial conditions rather than focussing exclusively on natural events that fit into a linear and ordered framework. Although chaos theory proposes a new way of looking at ancient dilemmas, this new frame of reference is perhaps only less inaccurate and less anthropocentric than the system of definitions it claims to have evolved beyond. Only the benefit of a wider temporal scale (also known as hindsight) can reveal the lasting value that twentieth-century mathematics and science will have in our ability to define Nature.

The microscope and the telescope are responsible for expanding our view of the world upwardly and inwardly. The repercussions of the expansion of our frame caused by these two advances are still felt in society as a whole and specifically in the scientific and artistic venues. These two fields have historically evolved both concurrently in relation to broader cultural forces and symbiotically in relation to each other. Art chronicles
and makes use of scientific advances, but its aesthetic motivation sometimes acts as a precursor to scientific and technological advances. In this thesis I will show that Robbe-Grillet, through his novels, continued this function of cultural recorder and initiator. His initial training as an agronomist enabled him to create a scientific aesthetic that synthesized 20th century Art and Science, and heralded the development of some fundamental aspects chaos theory.
Chapter II

The role of 20th science and mathematics in Robbe-Grillet’s novels and (counter)ideology.

A historical view is therefore essential in understanding complexity … The structural details of a sequence of [artistic] objects -if properly read- reflect man’s growing knowledge and control of the world about him, as definitely as do the words of past philosophers (70).

-Cyril Stanley Smith

As was mentioned above, Robbe-Grillet was trained as an agronomist before he made the conversion to novelist. The role that science plays in Robbe-Grillet’s early novels is central to his general theory of literature as an era-bound reflection of mankind’s relationship to the universe. Any artistic object can be treated as an archeological artifact whose structure reveals the level of knowledge and understanding that the society in which it was created possessed. In the same way that Balzac’s novels reflect the technologies, philosophies and artistic movements of the 19th century, so are Robbe-Grillet’s early works defined by advances in science and art current in the mid-20th century. As both an artist and a scientist Robbe-Grillet sparks a synthesis of the two disciplines into a 20th century world view. In this and following chapters, I will show that his role as both chronicler and harbinger of a 20th century philosophy is verified by
similarities between Robbe-Grillet’s scientific aesthetic, and the aesthetic proposed by chaos theory.

The presence of science in Robbe-Grillet’s novels plays a large role in the broader scope of his (counter)ideology. First, he called for an artistic reevaluation of the interaction between Man and Nature that ran contrary to the anthropocentric and ideology-bound structures of the psychological novel. Second, Robbe-Grillet wrote self-referential novels that evaded meaning in the sense that it is imposed by a dominant ideology exterior to the text.¹ These two theories of the novel, which formalize the rupture of the 19th century bourgeois ideology that had begun with Flaubert, are implemented in his texts through four narrative contrivances: a disruption of the functioning of metaphor through description, a reduction of the narrative into pure form, a disruption of traditional chronology and causality, and the destruction of characterization. Just as one can investigate the 19th century world-view through an analysis of the Balzacian novel, it is possible to indicate changes in the modern mind-set, and specifically advances in 20th century mathematics, that influenced Robbe-Grillet’s narrative.

¹ In the essays collected in Pour un Nouveau Roman, Robbe-Grillet clearly defines his theory of the novel. Of particular interest to this discourse are the essays Sur quelques notions périmées and the seminal Nature, humanisme, tragédie.
A summary of 19th century bourgeois narrative order will clarify the dominant ideology that Robbe-Grillet attempted to overcome. In *Le Degré zéro de l’écriture*, Roland Barthes shows that the use of the passé simple, the use of third-person narrative and a clear, cohesive novelistic form reflect the bourgeois ideology implicit in the 19th century novel. These three devices present fiction as a concrete positivist fact and assure the reader of the uniformity of causality, *personnage* and language. Together they aim to create verisimilitude in which the novel exhibits the passions of believable characters in the framework of a logical *dénoûment*. The passé simple represents a narrative order that stresses a logical causality and a hierarchy of facts; through the passé simple, “le verbe exprime un acte clos, défini, substantivé, le Récit a un nom, il échappe à la terreur d’une parole sans limite” (Barthes 27).

Like the use of the passé simple, the use of third-person narrative implicates the fictional characters into a story that pretends to have actually happened. Robbe-Grillet points out that the use of the third person in narration and the illusion of creating fictional characters marks the apogee of the individual in 19th century bourgeois society (Robbe-Grillet, *Pour*, 28). The use of “*il*” treats the fictional character as a historical entity, and in doing so props up the notion of a fictional order that is stable, realistic and *vraisemblable*. According to Barthes, “le ‘*il*’ manifeste formellement le
mythe ... et fournit à ses consommateurs la sécurité d’une fabulation crédible et pourtant sans cesse manifestée comme fausse” (29). Barthes indicates a paradox inherent in the use of the passé simple and third-person narrative: the reader and the writer both enter into a pact in which they ignore the fact that writing does not treat real people or actual events, but the artificiality of the writing is present in the very grammar of every phrase.

Reinforcing the necessary verisimilitude of the 19th century novel, the form served only to reflect the cohesiveness of the text. According to Barthes, “la forme était supposé au service du fond”; that is to say that the formal aspects of the 19th century novel helped to construct a realistic, ordered novelistic universe that reflected the uniformity of bourgeois ideology (42). Stressing the role of the novel as a chronicle of the culture in which it is written, Barthes asserts that, in the bourgeois novel, “la forme ne pouvait être déchirée puisque la conscience ne l’était pas” (8).

As Barthes shows, the rupture in European society that began in the mid-19th century sparked a concurrent rupture in art that tore apart the bourgeois ideology and shifted the artist’s attention to the problems of form and language. For our purposes it is also important to note that mathematics and science underwent a similar crisis starting in 1875 in which the foundations of Euclidean geometry and Newtonian physics were
undermined by “pathological mathematical monsters” such as Cantor’s set theory. The music, architecture and visual arts of the late-19th and early-20th centuries had already seismographically registered the reverberations of the societal fracture. Although certain authors such as Flaubert, Gide, Faulkner, Kafka, and Joyce had also registered the after-shocks, Robbe-Grillet asserts that critics (the guardians of ideology) enforced a strict balzacian order on the novelistic art form. Although, as Barthes showed, the 19th century ideology was at its base artificial, the balzacian narrative order had become the dominant ideology that was supposed by modern readers to be a natural order. Robbe-Grillet was fighting against the notion that an author must submit to the themes and structures of the dominant ideology in order to be considered a good writer. As is usually the case, Art had already evolved beyond ideology, but the guardians of the traditional order (academic critics and amateurs alike) were reluctant to let go of their monopoly on meaning. Recognizing that the imposition of an ideology jeopardized artistic liberty, Robbe-Grillet created an alternate order that called attention to the artificiality of ideology. While he admits that it is impossible to function outside of ideology, Robbe-Grillet’s narrative order operates from inside language and narration with the intention not only of disrupting the functioning of the dominant ideology, but also the functioning of any system of meaning exterior to the text. In
this way, Robbe-Grillet’s novelistic structures and theories are part of a logical progression established by Flaubert and other authors that followed who were faced with the crisis of form and language brought about by the fracture in the 19th century bourgeois conscience.

The most readily observable aspect of Robbe-Grillet’s novels that formalizes this rift with the dominant ideology is the presence of things that saturate the text. Whereas, in the balzacian novel, the description of objects serve the sole function of reinforcing the verisimilitude of the text, Robbe-Grillet’s descriptions produce a self-referential quality that strengthens the form of the novel and establishes the simple existence of Nature. Robbe-Grillet describes objects such as erasers, a tomato, coils of rope, a spider crab, a banister, banana plants, snowflakes and lampposts in minute and lengthy detail. Sometimes the contours and surfaces of the objects are reproduced perfectly in the text as if sketched with words, while at other times the text is concerned with an object’s relationship to other objects in the field of description as an interplay of distances. However, Robbe Grillet’s depiction of the universe is not a simple matter of rendering a hyper-real literary “nature morte”; some descriptions are so precise that they allow for inconsistencies in sensory perception. For example, in La jalousie, A…’s smile, which is originally described as “un sourire rapide” is then negated as a “sourire fugitif [qui] ne devait être
qu’un reflet de la lampe ou l’ombre d’un papillon” (Robbe-Grillet 26-27).

The things and gestures in his novels, then, are simply there and possess their own meaning (or no meaning at all), rejecting, by their sheer existence, any attempt to implicate them in a humanistic system.

This precise and stark portrayal of the universe was crafted with the intention of separating Man from Nature. By representing the universe realistically as a conglomeration of objects that have no rapport with human emotions, psychology, or passions, Robbe-Grillet replaced metaphor with description as the main currency of narration:

Décrire des choses, en effet, c’est délibérément se placer à l’extérieur, en face de celles-ci. Il ne s’agit plus de se les approprier ni de rien reporter sur elles. Posées, au départ, comme n’étant pas l’homme, elles restent constamment hors d’atteinte et ne sont, à la fin, ni comprises dans une alliance naturelle, ni récupérées par une souffrance (Robbe-Grillet, Pour, 63).

In Robbe-Grillet’s texts, description serves to delineate the concrete boundary he sees between Man and Nature. According to him, things are “là avant d’être quelque chose ; et il seront encore là après, durs, inalterable, présents pour toujours et comme se moquant de leur propre sens” (Robbe-Grillet, Pour, 20). That is to say that the being-there of objects exists outside of language and their essence is therefore fundamentally unattainable by Man. That we even have to describe Nature implies a division between subject and object. Robbe-Grillet’s fixation on
description amplifies this separation and exposes the deep chasm that exists between human beings and the universe in which they exist.

While this enterprise was misconstrued by his detractors as anti-humanist (and essentially anti-human being), the descriptions in his novels expose the artifice of a dominating anthropocentric view of nature as a reflection of human intrigues. Robbe-Grillet identifies metaphor as the device traditionally used to infuse human passions and tragedy into Nature. The process is reciprocal in that the use of metaphor attempts to contain or recuperate Nature into the realm of human understanding. His detailed description of objects blocks the functioning of metaphor by constructing a self-referential narrative in which “les choses” only have a relationship with themselves.

Robbe-Grillet sees the danger of entangling Nature in an anthropocentric web of metaphor and signification as one of having an artificial rapport with the universe. He uses the example of Mount Blanc to demonstrate how Nature confounds human attempts to assign exterior significations to objects that in reality only have an interior meaning unto themselves. Mount Blanc is an object in Nature whose basic structure on a simple level is a topography of contours and shapes. To look at Mount Blanc might stir feelings of majesty. One might even be tempted to use a vocabulary of analogies by ascribing qualities of magnificence, prestige,
heroism, nobility, or pride to the mountain itself in an attempt to have some sort of communion with Nature. The reality of one’s rapport with Mount Blanc, according to Robbe-Grillet, is that it has existed since the Tertiary Era and it will exist as an object in Nature long after human beings (the agents of signification) are eliminated. The mere existence of the mountain, the fact that it is, mocks human attempts to commune with it or contain it with metaphors. (Robbe-Grillet, *Pour*, 50-51)

Robbe-Grillet’s theories on the rapport between Man and Nature from the 1950s are part of a movement in the 20th century that culminated twenty years later in the awareness of anthropocentrism proposed by a fractal aesthetic. In the same way that with Robbe-Grillet there is a cognizance that Man always exists separate from Nature, so does fractal geometry show that human measurement and understanding is not the central fact of the universe. To put all of this into perspective, let us return to the question posed by Benoit Mandelbrot, “How long is the coast of Britain?” After deducing that the coastline is essentially immeasurable in the traditional sense, Mandelbrot concluded that

Nature does exist apart from Man, and anyone who gives too much weight to any specific [step length] lets the study of Nature be dominated by Man either through his typical yardstick size or his highly variable technical reach (Mandelbrot 27).

In Robbe-Grillet’s view, metaphors operate in much the same way as
Mandelbrot’s inherently flawed yardstick. To continue the analogy, metaphors are the linguistic yardsticks with which we attempt to fit the non-linear disorder of Nature into linear orderly human terms. The inadequacy of the yardstick and the metaphor in truly measuring the universe proves Robbe-Grillet’s assertion that “les choses sont les choses et l’homme n’est que l’homme,” and any attempt to bring them together by assigning an exterior signification is artificial (Robbe-Grillet, *Pour*, 47). Just as the contours of any coastline defy recuperation into a humanistic construct called “measurement”, so does Nature reveal that its essence is unknowable and unnameable through any system that is exterior to its frontiers be it psychological, political, or even scientific.

In Robbe-Grille’s estimation, however, it is through science that Mankind makes its most objective attempt to discover the interior composition of Nature. Literature and art in general have, in the past, utilized anthropocentric systems to analyze Nature but, “Seule la science, en revanche, peut prétendre connaître l’intérieur des choses” (Robbe-Grillet, *Pour*, 63-64). Returning to the example of Mont Blanc, the fact of the mountain’s altitude, the diversity of its geological composition, the terrestrial forces that formed it, its topography and the effect of erosion on its contours allow for an evaluation of the interior structure of the object.

La minéralogie, la botanique, ou la zoologie… poursuivent la
While science is the only “honest” human system that seeks to understand the interior of Nature, the fact of our investigation neither alters the true make-up of Nature nor does it change the fact that humans are separated from it. Although science is itself a human construction, and therefore within the bounds of ideology, its value, according to Robbe-Grillet, lies in the fact that it at least attempts to understand Nature on its own terms. Although Science does not escape the subject/object division that is implicit in the use of language, it has as its goal the a Platonistic discovery of the universe as it is. The use of metaphor and other humanistic systems, on the other hand, always remain exterior to Nature and can only exist as a mirror that reflects human passions but never allows a clear view into internal structures (Robbe-Grillet, Pour, 62-64). Robbe-Grillet develops this refusal of any complicity with Nature in his novels through a scientific narrative. The self-similarity, objective observation, hyper-real descriptions, self-referential structure and the absence of humanistic systems (psychology, politics, sociology, religion, metaphysics) that comprise his narrative reject exterior signification and maintain the firm boundary between humanity and the natural world.

In the same way that Robbe-Grillet’s scientific aesthetic rejects an
application of an exterior signification to Nature, it renders impossible an application of a dominant ideology exterior to the text. A scientific aesthetic is essential to the rejection of a dominant ideology because according to Robbe-Grillet, "ce qui s’oppose à l’idéologie, c’est la science" (Ricardou, ed., 45). In the broader context of his novelistic theory, he considers ideology as an established order which pretends to be natural and totalitarian, and in doing so attempts to recuperate a text into its formal system of references (Robbe-Grillet, Order, 4). The innovative power of Robbe-Grillet’s novels exists in the fact that, while acknowledging that in writing he is also establishing a certain order, he constructs the narrative in such a way that he calls attention to the artifice of a dominant ideology. Whereas all narrative structures wear an artificial mask, a dominant ideology does not acknowledge that its mask is false - it considers that its mask is natural. Robbe-Grillet asserts that he, too, wears a mask when he writes, but his narrative structures are constantly pointing to their mask telling the reader: writing is an artificial enterprise that can only be interpreted in the terms of the text itself. His is a system that accepts the artificiality of creating ordered ideologies; it accepts that the order of Nature is disorder.

Let us investigate some of the cultural changes of the early to mid-twentieth century, particularly in science and mathematics, that Robbe-
Grillet translated into his narrative structures. It has already been shown that Robbe-Grillet adopted the departure from a traditional understanding of the universe perceived as anthropocentric by modern mathematics. This shift in aesthetic does not claim to be less anthropocentric as much as it points to the anthropocentrism of all human systems. Another re-evaluation of the universe brought about by scientific advances, this time in quantum physics, is reflected in his theory of the novel. Rudy Rucker states in his *Infinity and the Mind* that “[b]y splitting atoms indefinitely, [modern physicists] arrived at the conclusion that there is only form and no content” (28). A parallel idea is found throughout the “La forme et le contenu” section of the essay *Sur quelques notions périmées* and most notably in the statement “…le véritable écrivain n’a rien a dire…Il a seulement une manière de dire* (Robbe-Grillet, *Pour*, 42). Robbe-Grillet asserts repeatedly that the plots of his novels are largely perfunctory. In lieu of a concentration on content, he proposes a narrative that consists of a reduction into pure form. There is in Robbe-Grillet’s writing the feeling that he *enjoys* the creation of complex structures that are layered in the text. The self-similar and self-referential structures in his novels create a format that resists the imposition of any dominant meaning. These two aspects of Robbe-Grillet’s novels will be developed below, but it is important to note here that it is through a reduction into forms that Robbe-
Grillet aligns himself with the “Art for Art’s sake” movement. In the “Art for Art’s sake” ideology, the work of art does not exist for any other end except to fulfill its function as Art. In this self-referential relationship, the artistic object does not have a religious, political, psychological, humanistic or metaphysical justification; it simply is. The “Art for Art’s sake” movement, like Robbe-Grillet, operates inside of ideology, but seeks a liberation of meaning in Art by giving the observer the freedom to interpret without the encumberment of a dominant ideology that exists either interior or exterior to the work of art.

The abandoning of traditional chronology is another example of an application of twentieth-century science in Robbe-Grillet’s novels. Whereas chronology and causality in the psychological novel stem from a nineteenth century view of the passage of time and the four seasons, Robbe-Grillet’s novels reflect a twentieth century world-view of a space-time continuum (Robbe-Grillet, Order, 9). Einstein’s Special Theory of Relativity and more specifically Kurt Gödel’s paper “A remark on the Relationship Between Relativity Theory and Idealistic Philosophy” question the passage of time as a series of irrecoverable snapshots that get lost in the past.

Gödel attempts to show that the passage of time is an illusion. The past, present, and future of the universe are just different regions of a single vast space-time. Time is part of space-
time, but space-time is a higher reality existing outside of time (Rucker 167).

The rejection of traditional chronology and the adoption of a relativistic view of time are most notable in La jalousie and Dans le labyrinthe. The format of La jalousie is such that it is impossible to reconstruct a logical passage of time from the beginning of the text to the end. The various scenes that emerge with variations in the text seem to be completely chaotic and random in their appearance. It would also be impossible to develop any sense of causality between any of the scenes. For example one could not be sure that the discussion of the novel set in Africa read by Frank and A... took place before, after or both before and after the crushing of the centipede. With all of the scenes emerging randomly in and out of the view of the reader, the text seems to be continually bent back around on to itself in an elliptical or spiral form. In lieu of establishing logical chronology, the reader is invited to regard the whole time sequence of the novel as one interval of time on the space-time continuum.²

Robbe-Grillet presents a similar view of time in Dans le labyrinthe where the narration weaves the thread of time in and out of the physical universe of the text. From the street scene to the room with red curtains;

² see Chapter IV of this thesis for the development of these ideas and a possible explanation of the temporal fracturing of La jalousie.
through the painting on the wall of the room to the café scene; and back out into the street, the chronology of the text winds in and out of the labyrinthine structure of fictional space.

Robbe-Grillet also creates situations in which many sections of space-time happen concurrently. The first paragraph of *Dans le labyrinthe* informs the reader with precision that one is outside of a chronological progression of seasons by experiencing the different aspects of the space-time continuum at once. At the beginning of the paragraph, the “narrator/soldier” is shading his eyes and lowering his head from the rain while looking at the wet asphalt. At the point that the text describes the rocking of denuded black branches agitated by the wind being projected in shadow on a white wall, there is a skip in the text as if on a vinyl record album. All of a sudden it is summer, there is no vegetation in the scene and the unnamed character is shading his eyes from the *sun* while looking down at a *dusty* sidewalk. Four paragraphs later the text skips again and the same scene is reproduced but with snow (Robbe-Grillet, *Dans*, 9-11).

On a rudimentary level the analogy of the vinyl record album is applicable to a forth-dimensional space-time continuum that is an infinite pre-existing coded entity whose groove, or path is turned around itself in a spiral pattern. All of space-time exists at once like the recorded message on an album, it is where we choose to put down the needle that we observe
that particular aspect of the whole.

It is important to clarify here that, when we are dealing with connections between modern mathematics and Robbe-Grillet’s narrative structures, whether or not he was familiar with the formal aspects of Einstein’s or Gödel’s theories is less significant than that he had a general knowledge of them. Although Robbe-Grillet’s pre-1950 training in the sciences makes it plausible that he may have had direct contact with the particulars of these notions, these ideas had already gained general currency in post-World War II civilization. In this context, Robbe-Grillet, in writing novels, was continuing the primary function of the artist as a catalyst and a chronicler of Science, Art, and culture.

Kurt Gödel’s two Incompleteness Theorems⁴ propose a philosophical world view that forms the foundation of Robbe-Grillet’s novels and (counter)ideology. In 1930, Gödel showed mathematically that there is no finite universal truth. More specifically, Gödel’s two theorems show that any formal system is both incomplete and unable to establish its own consistency. A formal system, which is “a system of symbols together with rules for applying them”, must have 1) an “alphabet” of symbols that

2 The chapters “Robots and Souls” and “Gödel’s Incompleteness Theorems” in Rudy Rucker’s Infinity and the Mind illustrate the reevaluation of the universe caused by Gödel’s mathematical philosophies. The ideas presented in this section borrow heavily from this work.
constructs a formula; 2) a grammar that produces meaningful formulas; 3) A set of meaningful formulas defining the axioms of the system; and 4) some rules of interference that describe the combinations of axioms into proofs of other meaningful formulas (Rucker 268). The set of natural numbers and the rules that govern them is an example of a formal system. The rules governing the set of natural numbers are composed of axioms that generates a number of proofs that are called “true” if they fit into the logic of the system. For example, we can assert Goldbach’s conjecture that any even number greater than two is the sum of two prime numbers (4= 2 + 2; 8= 5 + 3; 10= 5 + 5; etc...).

If formal systems were complete and able to prove their own consistency, then it would be theoretically possible to program an extremely powerful computer with the components a universal formal system (that is to say a system whose rules encompassed the functioning of all knowledge). This “Universal Truth Machine”, as Rucker calls it, could answer any question posed to it about any aspect of the universe. There would be no room for debate in the artistic or scientific venues because we would just go to the computer to validate or disprove a theory (Rucker 275-276).

This total knowledge of the universe was shown to be impossible through Gödel’s Incompleteness Theorems. His Theorems disrupt the very
notion of knowledge because they attempt to show that human understanding at any level is both incomplete and unable to establish consistency; they show that “[a]ny system of knowledge about the world is, and must remain, fundamentally incomplete, eternally subject to revision” (Rucker 161). Before Gödel it was possible to state that science and mathematics could never have all the right answers, but post-Gödel philosophies could only marvel at their own lack of understanding. Even a theorem as simple as Goldbach’s conjecture cannot be proven to be complete or consistent. Gödel’s Theorems allow us to conjecture that somewhere in the set of natural numbers there is an even number that is not the sum of two primes. Rather than despair at human inability to perceive a final transcendental truth, Rudy Rucker points out that to understand Gödel’s proof paradoxically leads to a certain liberation from the maze of the human intellectual struggle (Rucker 165).

Gödel’s theorems can be applied to a formal system such as Robbe-Grillet’s (counter)ideology as follows:

Many novels are primarily collections of statements about some individual. If we take English as the language, and take the usual rules of inference, then a novel can be thought of as a set of axioms about some Johnny X. A novel is a complete description of Johnny X if it enables us to answer any possible question about him (Rucker 276).

Of course no traditional novel that is a study of passions can ever
provide a complete description of a character because there will always be a fact about an imaginary entity that is left out of the formal system of the novel. Despite this fact, literary criticism has traditionally treated characters as if their passions, sufferings, and intrigues were real. The artifice in the creation of characters lies in the fact that the traditional novel cannot provide a complete system that can generate any proof about a character. For example, Rucker asserts, “Did Raskolnikov get big laughs in Siberia? You’ll never find out from reading Crime and Punishment” (276). Is Mathias ever arrested and convicted for the alleged murder of Jacqueline? Le voyeur does not provide us with the answer.

Rucker shows that there is one way to construct a complete literary system: “Consider a novel whose only sentence is, ‘Johnny X does not exist at all.’ In this case we can answer every possible answer about Johnny X” (276). In Dans le labyrinthe and particularly in La jalousie, Robbe-Grillet achieves this complete system through a total reduction of the characters. The identity of the soldier in Dans le Labyrinthe is reduced to an artificial serial number (12345) that is not effectively his own. The narrator of that novel is ambiguously indicated as the doctor character, but that fact, because of various contradictions, cannot be backed up by the text. A… of La jalousie is reduced to an unutterable Kafkaesque name that only has a limited amount of facts available about her character and her physical
appearance.

It is in the absent narrator of *La jalousie* that Robbe-Grillet paradoxically devises the complete description of a character. The narrator has no name. "He" does not have an identity, emotions, a physical appearance, passions, or preferences; the narrator, if he exists at all, has been reduced to a pure objective presence that never expresses the action of any verb. The statement, "The narrator is a jealous husband" is as valid as "the narrator is a centipede", "the narrator is a quincuncial arrangement of banana plants" or any other statement that could possibly be imagined. Robbe-Grillet liberates meaning by opening it up to any interpretation through this paradox: everything that can be said about the narrator is true because nothing about the narrator is true.

Rucker continues the discourse of what constitutes consistency in a system: "A novel is a consistent description of Johnny X if it does not logically lead to a statement of the form [A & not A]" (277). If a novel contains contradictory statements about a character following the (A & not A) format then it is seen as a tautology in which every possible description of the character is true. More specifically, "if [a system] can prove a contradiction, then the whole system ... more or less breaks down and produces 'proofs' of every sentence in the language of [the system]" (277).

Let us turn our attention to an interior duplication in *La jalousie* that
relates directly to the absent narrator and exhibits a total negation of his existence and thus leads to a breakdown of meaning in the formal system of the novel. In La jalousie Frank and A... are reading a novel whose action takes place in Africa and provides a *mise en abyme* or *interior duplication*. This conclusion is reached because the novel being read by Frank and A... appears to be *The Heart of the Matter* by Graham Greene (to which Robbe-Grillet attests to having an obsession) and there are many details in Greene’s novel that are reproduced by Robbe-Grillet in *La Jalousie* (Morrissette, *The Novels*, 119-120). In this way, certain elements that exist on the level of the microcosm (the novel being read) are reflected in direct proportion along the macrocosm (the context of *La jalousie* as a whole).

On the second to last full page of *La jalousie* there is a curious paragraph describing the main character of the African novel read by Frank and A... in which he is completely negated by a string of purposefully contradictory statements. The paragraph consists of eight statements and each successive statement fully negates the former:

Le personnage principal du livre est un fonctionnaire des douanes. Le personnage n’est pas un fonctionnaire, mais un employé supérieure d’une vieille compagnie commerciale. Les

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4 see Chapter III for a detailed analysis of Robbe-Grillet’s use of *mise en abyme* and its departure from traditional interior duplications.
affaires de cette compagnie sont mauvaises, elles évoluent rapidement vers l’escroquerie. Les affaires de cette compagnie sont très bonnes [etc...] (Robbe-Grillet, *Jalousie*, 216).

If the African novel is accepted as an interior duplication, then the main character corresponds directly to the pure objective presence that is the narrator of *La jalousie*. The narrator, then, is not just an entity who is passively non-existent, but who is actively negated by a calculated tautological system of contradictions. It is through these contradictions under the format (A & not A) that the whole system of meaning in the text breaks down and allows for an infinite number of true interpretations of the novel. Robbe-Grillet does not just call attention to the artifice of creating fictional characters; he actively constructs narrative inconsistencies that disrupt the entire notion of “personnage” in literature.

In the preceding section I showed how Gödel’s Incompleteness Theorems apply to specific narrative structures in Robbe-Grillet novels. These same ideas can equally be applied to the broader scope of Robbe-Grillet’s (counter)ideology. For Robbe-Grillet, an “ideology is established order which is masked as natural order” and that attempts to recuperate the meaning of a text into its system of rules (Robbe-Grillet, *Order*, 4). To put that statement into the terms of Gödel’s philosophy, an ideology is a formal system that pretends to be a “Universal Truth Machine”, but is in
reality incomplete and unable to prove its own consistency.

While Robbe-Grillet asserts that, for now, a system of meaning can never function outside of ideology, it is possible to resist the application of a dominant ideology by calling attention to the *artifice* of a “Universal Truth Machine”. The narrative structures present in Robbe-Grillet’s novels cause a rupture in the normal functioning of a formal system of meaning/interpretation by working inside of the system of literature to disrupt metaphor, chronology, causality, form and the creation of realistic characters. To summarize, Robbe-Grillet accomplishes a rupture of meaning in two ways: first, through the use of detailed descriptions of objects whose presence confounds their recuperation into a formal system; and second, through the use of intentionally contradictory tautological statements that nullify any possible interpretation by enabling any meaning to be derived from the text. In this way, any ideology, be it sociological, psychological, psychoanalytical, political, religious or whatever, is rendered relative when it attempts to recuperate one of Robbe-Grillet’s texts simply because an infinity of interpretations are true (A & not A).

Although I used the negative verbs “rupture”, “contaminate”, and “destroy” in the preceding paragraph, the functioning of Robbe-Grillet’s ideology is actually a positive, creative operation. Paradoxically, by calling attention to the artifice of a literary system that claims to be both
complete and able to prove its consistency, Robbe-Grillet confronts the reader with his own liberty. More specifically,

[The reader] is not told that the world has been constructed once and for all and that his only duty is to reproduce this world one more time according to the already created forms ...; he is not told, then, that man will never change ... (Robbe-Grillet, Order, 5).

Robbe-Grillet’s (counter)ideology affords the artist the liberty to create and the reader the liberty to interpret while challenging them both not to impose a dominant ideology in the process. He presents a world that is shifting and always open to revision. By turning the very notion of ideology against itself, he attempts to free the meaning of his novels from the dialectical trap of good versus evil, true versus false, logical versus illogical. He also attempts to free the novel from the ideological trap of being recuperated into a dominant system of interpretation.

Robbe-Grillet is aware of the danger that his own ideology is itself susceptible to a recuperation into formal system. He describes this ideological trap as “a question of replacing the Tsar’s statue by one of Stalin” (or as Woody Allen put it at the end of Sleeper, “stealing Erno’s nose”) (Robbe-Grillet, Order, 16). The artist and the critic must always strive to exist on the margins of ideology because the alternative is a stagnant, totalitarian, positivist world in which a “Universal Truth Machine” pretends to be governed by a consistent and complete formal
system. In such a world it would no longer be necessary to create art or to use logic or reason; the dominant ideology would provide all of the correct answers.

The aspects of Robbe-Grillet’s narrative structures that I have presented in this chapter, and specifically the narrative repercussions of Gödel’s theorems, fit into a larger movement in the 20th century worldview: the triumph of Platonism over positivism. Robbe-Grillet, as a scientist writing novels, chronicles this shift in the 20th century away from what Hayles calls the “unambiguous connection between theory and observation, knowledge and perception” (Hayles 222). By stating that Nature was there before being something, Robbe-Grillet initiates a worldview in which Man’s only limitation in defining the universe is the language in which he is entrapped. Robbe-Grillet asserts that any system of analogies and metaphors attempts to recuperate the unknowable of nature into a quelconque humanistic system; he rejects this notion by stating that humans can only describe Nature, they can never possess it. It is through description that Robbe-Grillet’s Platonism comes into focus: he attempts to define the objective truth of Nature at the same time that he calls attention to the artificiality of such an operation. Human description of the universe can only ever be subjective; it is inextricably imbedded in its own cultural frame. By accepting the inconsistency and incompleteness of all human
systems, Robbe-Grillet liberates creative artistic possibilities. If, in the
countext of the human experience, nothing is true, then everything is
permitted.

In this chapter, I have shown that a work of art can exist as a cultural
artifact that has the ability to both chronicle and herald advances in society.
Taken as a cross-section of the society in which he wrote, Robbe-Grillet’s
narrative structures represent the logical extension and the formalization of
a shift from 19th century bourgeois ideology to a 20th century world-view.
That Robbe-Grillet was writing from an interdisciplinary scientific point of
departure reinforces the value of his works as a synthesis of cultural
viewpoints. Although it is still too early to definitively indicate the 20th
century mind-set, we can already point to a dominance of Platonism that
sees its extension in four major shifts: the rejection of a positivist
viewpoint; the disruption of linear causality; the onset of self-
referentiality; and the assertion that all human ideologies are both
incomplete and unable to prove their own consistency. Reinforcing the
role of artist as chronicler and catalyst, these shifts in our cultural frame of
reference that are essential to the narrative structures of Robbe-Grillet’s
early novels are also central to the development of chaos theory.
Chapter III

Fractal mise en abyme: the presence of self-similar structures in Robbe-Grillet’s novels.

An essential aspect of a good work of art ... lies in the presence of this reciprocal relationship of the parts to each other at many different levels of organization and to the whole, as well as to the widening circles of external things (69).

-Cyril Stanley Smith

In a speech given at the University of Chicago in 1976, Robbe-Grillet indicated that for him the pleasure in writing came from “organizing structures that seem to [him] beautiful, demonstrably provable, even almost pedagogic” (Robbe-Grillet, Order, 3). This chapter will investigate some of the structures that are layered onto Robbe-Grillet’s texts, show how the intricacy of these structures fit into the context of his theory of the novel, and make a connection between the aesthetic proposed by the investigation of these structures in relation to fractal geometry.

The much-discussed mise en abyme, or interior duplication, is an artistic device that saw its most extensive self-conscious use and development in the 20th century in the New Novel.¹ As described above in

¹see Bruce Morrissette’s comprehensive essay “Interior Duplication” in his Novel and Film which extensively investigates both the historical precedents and modern applications of mise en abyme.
reference to the African novel being read by Frank and A... in La jalouse. mise en abyme is generated when a thematic or structural element in the macrocosm of the text is reflected in smaller detail at the level of the microcosm. Although examples of various degrees of mise en abyme occur throughout the history of art, its modern, self-conscious use was first composed into a theory by Goethe and formalized by Gide. Gide’s use of mise en abyme can be put in the context of the rupture of 19th century bourgeois ideology in which the artist “a cessé d’être un témoin de l’universel pour devenir une conscience malheureux (vers 1850)…” when “…son premier geste était l’engagement de sa forme” (Barthes 8). Likewise, Gidian mise en abyme represents a departure from its historical use in that he employs the device self-consciously and explicitly in all of his texts; the shift in mise en abyme documents an engagement of the author with the formal aspects of his narration. The aesthetic pleasure derived from the use of interior duplication is one of proportion and scale in fictional space. Gide was the first to indicate the proportional harmony implied by interior duplication:

J’aime assez qu’en un œuvre d’art, on retrouve ainsi transposé à l’échelle des personnages, le sujet même de cette œuvre. Rien ne l’éclaire mieux et n’établit plus sûrement toutes les proportions de l’ensemble [italics mine] (qtd. in Morrissette, Novel, 142).

For Gide, the mise en abyme was a matter of clarification and proportion.
What exactly is this proportion that he describes? I propose here that the literary use of *mise en abyme* is identical to the traditional use of the golden section in Art and Architecture. The equational form of the golden section is \( A:B = B:(A+B) \) and what it describes is a harmonious reciprocal relationship between two unequal parts of the whole (Doczi 2). On any given line there is only one point that will bisect the line such that the small section is in the same proportion to the large section as the large is to the whole. By turning the small section of the line at a 90° angle to the large, one produces half of a golden rectangle. The golden section, and its counterparts the Fibonacci set and the logarithmic spiral, are found throughout nature from the disk flowers of a sunflower to the spiral of a nautilus shell. Perhaps because of its natural precedent, the proportional harmonies of the golden section lie at the foundation for the classical aesthetic in Greek statue and architecture. (see Fig 3.1)

I propose that the aesthetic pleasure derived from a text containing a traditional interior duplication is identical to the visual gratification derived from the harmonious proportion of the golden section; the only difference between the two being that the golden section is produced in two- or three-dimensional space and the *mise en abyme* is produced in imaginary or fictional space. Nevertheless, the use of interior duplication calls attention to the harmonious reciprocal relationship between the whole
text and the smaller section of the text reproduced *en abyme* while at the same time clarifying the themes and structures of the text.

An investigation of a traditional interior duplication in *La jalouse* will clarify the relationship between mise en abyme and the golden section. The song sung by the second chauffeur at the beginning of the fifth section of the novel is a perfect reproduction *en abyme* of the whole narrative structure of the text:

A cause du caractère particulier de ce genre de mélodies, il est difficile de déterminer si le chant s’est interrompu pour une raison fortuite...ou bien si l’air trouvait là sa fin naturelle.

De même, lorsqu’il recommence, c’est aussi subit, aussi abrupt, sur des notes qui ne paraissent guère constituer un début, ni une reprise.

A d’autres endroits, en revanche, quelque chose semble en train de se terminer; tout l’indique: une retombée progressive, le calme retrouvé, le sentiment que plus rien ne reste à dire; mais après la note qui devait être la dernière en vient une suivante, sans la moindre solution de continuité, avec la même aisance, puis un autre, et d’autres à la suite, et l’auditeur se croit transporté en plein cœur du poème... quand, là, tout s’arrête, sans avoir prévenu (100-101).

This portion of the text, which is situated in the exact center of the novel, is a perfect blueprint *en abyme* for the narrative structure as a whole. The description of the second chauffeur’s song is a simultaneous description of the shattered chronology and the random appearance and disappearance of scenes indicative of the whole novel. In this case, where the structure of the text is disordered, the second chauffeur’s song serves as
a clear point of reference from which the reader can access Robbe-Grillet’s narrative intentions. A diagram of the proposed harmonious proportion of the song to the narrative structure in fictional space is offered below:

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the microcosm       the macrocosm
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the song of the      the narrative structure
second chauffeur     of the novel
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The line is, of course, bisected such that the microcosm is in the same proportion to the macrocosm that the macrocosm is to the whole text following the construction of the golden section.

Examples of Gidian mise en abyme abound in modern literature, but the New Novelists, and Robbe-Grillet in particular, represent a further departure from the original model in its purpose and execution. Traditional use of mise en abyme functions to strengthen the harmonious aesthetic quality of the text by reinforcing and clarifying the themes of the narrative. Robbe-Grillet, on the other hand, exploited mise en abyme to create a “pure”, scientific, self-referential quality that closed off the structure of the text to any recuperation by an ideology-based system of meaning. Robbe-Grillet departs from traditional interior duplication by the fractalization of the same structures along various levels of the microcosm of fictional space. Like traditional mise en abyme, a fractal interior duplication implies a harmony, but it is a harmony that is rooted in
the order/disorder paradox of Nature proposed by chaos theory rather than evenly proportioned ratios implied by the golden section.

Let us bring into focus some of the ideas that have so far been presented on the topic of interior duplication. Although mise en abyme has always implied a certain self-similar quality, the relationship between the super- and sub-structure of the text followed proportional ratios exemplified by the golden section. In this way, traditional interior duplication only recognized one level below the frame of the text.\(^2\) This relationship between the two parts of the whole in fictional space can be thought of as a picture of a man holding a picture of himself. Although an interior duplication exists, the proportional relationship between the two parts is actually quite linear. This linearity generates the clarifying and harmonious aspects of the mise en abyme.

Robbe-Grillet introduces a non-linear, fractal dimension to the interior duplications in his texts that takes into account the possibility of an infinity of stratum contained within the frame. The functioning of this

\(^2\) Morrissette indicates only three examples out of a multitude of mises en abyme throughout history in which more than one level is recognized below the frame of the text. The first is Hamlet in which there is a double duplication of the interior plays; the second double duplication is Gide’s Le journal des faux-monnaieurs which describes the writing of a novel that describes the writing of a novel; and the third is Aldous Huxley’s Point Counter Point which is the first novel to recognize more than two levels below the frame (Morrissette, Novel, 147-149).
recursive interior duplication can be thought of as a picture of a man holding a picture of himself holding a picture of himself holding a picture of himself.... In scientific terms, the pleasure derived from discovering Robbe-Grillet’s duplications is similar to that of an investigation of crystalline sub-structures under a microscope or ‘zooming-in” on the scales of the Mandelbrot set in that the same shapes and structures appear with variations as the frame focusses deeper into the aggregation. In this way, Robbe-Grillet’s scientific narrative is oriented toward discovering an interior reality of the objects and gestures in his novels rather than an exterior reality based on ideology.

As will be shown in the following section, mise en abyme as practiced by Robbe-Grillet meets all the criteria for a fractal shape in fictional space because the same patterns occur with variations in the microcosm implying an infinity of sub-structural levels. Just as fractal geometry presents a departure from linear, rectifiable Euclidean mathematics, so do Robbe-Grillet’s fractal interior duplications deviate from the linear proportional harmonies implied by traditional mise en abyme.

Let us turn our attention to the texts themselves to elucidate the various theories that have been presented and to discover how Robbe-Grillet formally produces the pleasure in reading by constructing fractal
structures in fictional space.

**Arabesques, quincuncial arrangements, the Fournier Universe and the point at infinity:**

The quincunx and the arabesque are two components of what Morrissette describes as Robbe-Grillet’s “‘thematic’ reservoir” *(The Novels, 295)*. These recurrent themes in his novels introduce complicated and aesthetically beautiful structures into the fictional space. The structures generated by the quincunx and the arabesque create the fractal self-similarity that is central to Robbe-Grillet’s scientific aesthetic. These elementary patterns are generally used to deepen the levels of the sub-structure, and in the case of *Dans le labyrinthe*, the fictional space is itself modelled on the geometric patterns of the arabesque. This fractal mise en abyme reinforces the self-referentiality of the text and thereby obstructs a recuperation by any dominant system of meaning.

The quincunx, whose basic form is based on a grouping of five identical to the shape of the five dots on the face of a die, is the most efficient space-filling shape known (see Fig 3.2). Sir Thomas Browne, in his *The Garden of Cyprus*, evaluates the historical use of the quincunx (also known as a lozenge). In the chapter “The Forms of Tissues” in his *Growth and Form*, D’Arcy Thompson shows how, because of surface tensions, the quincunx is the natural arrangement of any aggregation of five or more
cells. Thus, the quincunx is found in the cellular structure of all metal, crystal, and vegetative formations. In *A Search for Structure*, Cyril Stanley Smith gives a mathematical equation detailing how the quincunx “can be superimposed at some scale on any extended space-filling tessellation” (8). That Robbe-Grillet was interested in revealing the scientific interior of objects in Nature, reveals why he should choose the quincunx as the foundation for the narrative structure of *Dans le labyrinthe* and as a recurrent theme in all of his other novels.

It will be useful to trace the general use of the quincunx and other fundamental structures in Robbe-Grillet’s early novels. The vertices of any grid are arranged quincuncially, calling to mind the regular floor tiling that appears in Dupont’s house in *Les gommes* (23) and the ubiquitous “carrelage noir et blanc” found in all of Robbe-Grillet’s novels. In *Le voyeur*, the quincunx appears in the shimmering lozenges of light reflected off of the bay (58); the “carrelage noir et blanc” in the bedroom scene that is arranged in a tesselated pattern of alternating octagons and squares (67); and on the second movie poster, whose depiction of shrubs is arranged in a regular intercrossing of lines, and whose title: “Monsieur X. sur le double circuit” contains the quincuncial X that is duplicated en abyme by the arrangement itself of shrubs in the picture (167).

In *La jalouse* the quincuncial structures reach even deeper self-
similar levels. The descriptions of the quincuncial arrangements of banana plants take up a large part of the narrative, and this in turn reinforces the microcosm/macrocosm interplay of the novel. Consider that the rows of banana plants that are quincuncially arranged are contained in plots of land that form a grid of more or less regular trapezoids and rectangles. A grid of trapezoids is arranged quincuncially and the boarders of each individual shape combine to construct a continuous line of chevrons. This "lignebrisée, à angles alternativement rentrants et saillants dont chaque sommet appartient à une parcelle différente" is described as deliniating the boarder between the plantation and the unplanted zone at the edge of the jungle (33). The alternating apexes of the hatched pattern are themselves arranged quincuncially. If we add to this D'Arcy Thompson's assertion that any aggregation of cells naturally arrange themselves quincuncially, then on a deeper, cellular level, there would have to be another quincuncial arrangement inside of the banana plants. The five plantation workers are also described as arranged "en quinconce" (118). This whole self-similar arrangement is animated by the absent narrator when, through a circular defect in the glass of a window, he generates aliasing defects (also known as Moiré patterns) on the rows of banana plants (55).

An analogous situation is produced inside the house, linking the quincunx to another of Robbe-Grillet's themes: the rapport between
inside/outside that lends a topological, one-sided texture to the forms in the novels. According to the plan reproduced in the American edition of La jalousie, the house is a square that implies the basic quincuncial figure. The basic X of the quincunx is again found on the back of the straw chairs in the dining room (69). The porch surrounding the house is in turn a grid of square flagstones (recall that when a grid is turned 45°, the vertices reveal their quincuncial arrangement). The interior hallway of the house is in turn tesselated by a quincuncial grid of tiling that produces a continuous series of regular chevrons that reflects the hatched line of the banana plantation.

An aliasing defect analogous to the one produced from the inside of the house to the outside by the defect in the window is similarly generated by the rocking of the oil lamp creating undulations in the quincuncial chevron pattern on the floor (162). Both the inside and the outside of the

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3 In Dans le Labyrinthe Robbe-Grillet establishes a rapport between “outside” exemplified by the regular descent of perfectly formed snow crystals, and “inside” exemplified by a similar descent of dust particles. In turn, the motif reproduced innumerable times on the wall of the room in regular straight lines replicates the description of the snow and dust. The topological implications of this structure are detailed in Morrissette's two essays, “The maze of fictional creation: In the Labyrinth” and “Topology of the Nouveau Roman.”

4 Moiré patterns are produced when some Julia sets are plotted on the complex number line of a computer (see Peitgen ed., 160). Robbe-Grillet was describing fractal shapes contained in moiré patterns years
fictional space in *La jalousie* are modelled upon a continual duplication of a quincuncial pattern that is evident at every sub-structural level. It is necessary to ferret these structures out of the text because Robbe-Grillet invests many words in describing them, and then states in his theoretical writings that they are of primary importance to his construction of the narrative. In a novel such as *La jalousie* where the plot is completely artificial and contrived, the aesthetic pleasure in reading is derived from watching the intricate unfolding of the same shapes and themes at every scale in the microcosm of fictional space.

One can analyze the fundamental multi-layered structures that occur in all of Robbe-Grillet's early novels. For example, in *Le voyeur*, "la page blanche" in the middle of the novel reflects, at every level, the "hole" in the text that is ostensibly filled by Jacqueline's sadistic murder (88). Mathias must struggle to fill these ellipses with false alibis which in turn generates the tense, psychotic impression of the novel. The ellipsis is reproduced in the title where the middle two letters are omitted from "le voy [ag]eur" to create "le voyeur". "La page blanche" appears again in the flashback in which Mathias, as a young boy on a rainy day, is drawing a picture of a seagull and the white pages of the notebook "constituent la seule tache claire" before computers enabled a visualization of aliasing defects in the chaotic orbits of the Julia set.
in the room (21). The ellipsis also occurs in every conversation that Mathias attempts to have: “il était obligé, de nouveau, de lutter contre les blancs qui risquaient à chaque phrase de trouer la conversation.” The structure of *Le voyeur* is generated by a hole that on every page threatens to disintegrate both Mathias’ alibis and the text itself.

Whereas in *La jalouse* the fractal mise en abyme of the quincuncial structure is used primarily as an aesthetic device to both deepen and enclose the narrative, its application as an aspect of the arabesque in *Dans le labyrinthe* also assumes a generative function. I showed in Chapter Two that, in the beginning pages of *Dans le labyrinthe*, a model is offered for the shifting chronological structure of the novel. A paragraph that is connected to the chronological description also provides a model, en abyme, for the patterns that are reflected in the structural composition of the fictional space:

> Dehors il neige. Le vent chasse sur l’asphaltè sombre les fins cristaux secs, qui se déposent après chaque rafale en lignes blanches, parallèles, fourches, spirales, disloquées aussitôt, reprises aussitôt dans des tourbillons chassé au ras de sol, puis figés de nouveau recomposant de nouvelles spirales, volutes, ondulations fourchues, arabesques mouvantes aussitôt disloquées (11).

On one level this rendering of a natural scene is similar to da Vinci’s study on water alluded to in chapter one in that it describes perfectly the fractal nature of turbulent air flow revealed through the movement of
snow crystals. Each whirlwind and eddy becomes decomposed ad infinitum into a loop of other shapes that reoccur at every scale.

In the citation, snow crystals are shown in turbulent flow, forming undulating arabesques that rhythmically break apart and reform themselves according to gusts of wind. Not only does this description itself exhibit self-similarity, but it is also a reproduction, en abyme, for the entire structure of the novel. The arabesque, mentioned here in a paragraph establishing the parameters of the fictional space-time, is a blueprint for the entire composition of the narrative.

The three basic notions upon which geometric Islamic art is based are the same three formulae that Dans le Labyrinthe follows in its construction. An analysis of Islamic art shows that all arabesques follow three basic principals: 1) they exhibit the same geometric shapes on every level of the microcosm and the macrocosm; 2) they are tesselated in quincuncial patterns; and 3) they have as the basis of their composition the notion of a point extending out into a circle that in turn becomes the “point at infinity.”

Let us first analyze the self-similar and quincuncial aspects of Dans

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5 Keith Critchlow’s Islamic Patterns: An Analytical and Cosmological Approach provides a detailed description of both the essential structures and the spiritual implications of the arabesque.
le labyrinthe and relate them to the arabesque pattern upon which it is based. My investigation will trace the quincuncial images through the various microcosmic and macrocosmic scales of the novel; I will then provide a model that organizes the fractal interior duplications which appear on the surface to be disordered. On the deepest level of the microcosm the snowflake is itself a self-similar fractal object that is composed of twelve identical parts (see Fig.3.3). Each individual part contains shapes that are reflected by the crystal structure as a whole. The twelve individual parts join to form the six branches evident in the structure of the crystal. A line is produced on the boundary where each of the twelve parts meet to form the six branches, and these six lines intersecting at the center of the flake exhibit an overlapping of three quincuncial “X”s.

The analysis of the text is taken one level higher in the macrocosm by considering Figure 3.4 as the model for the arabesque described in the original citation in which snow flakes combined to form an arabesque. This lattice pattern is a typical arabesque in that it is composed of a basic generating shape arranged quincuncially in two dimensional space. Notice that the shape that is arranged quincuncially is itself "snowflakesque" with its six branches implying the three overlapping quincuncial Xs. Notice also that a smaller, identical shape is duplicated both inside of the larger shape
en abyme, and around it in a circular pattern. The lines implied by these overlapping circular patterns cannot all be digested simultaneously by the eye, so on another level the structure gives the impression of containing a superimposition of undulating intersecting arcs. This phenomenon exhibits the *interlaced* aspect of Islamic geometric art.

Taking into account the same shapes that recur and re-occur at every scale, Robbe-Grillet describes a fractal shape in detail: snowflakes (which are themselves fractal and quincuncial) arrange themselves into larger snowflake patterns, which are themselves arranged quincuncially into an arabesque and in turn generate a wealth of other shapes. This process of generating arabesques out of snowflakes is itself part of the fractal and chaotic turbulent flow of wind and snow crystals described by the text (11).

The quincuncial structures do not stop there! The initial mention of the arabesque provides the model for the rest of the fiction space. As our attention is drawn further upwards, successively observing every macrocosmic scale in the frame, the same quincuncial structures repeat themselves so that a very concise fractal structure is established in the text. The surface of the layer of snow is described as “sans éclat, mais intacte, égale, finement pointillée de ses granulations originelles” (17). This describes a stack of individual snow crystals in a three-dimensional space-filling tessellation, and, according to Cyril Stanley Smith’s equation, a
quincuncial arrangement can be superimposed onto this stack. In turn superimposed onto this three-dimensional quincuncial stack are the soldier’s footprints. These prints are described as “oscillations parallèles, identiques, mais contrariées” (94), and in the interior of each individual footprint, there exists another quincuncial series of holes printed in the snow by the nails on the soles of the soldier’s boots (18). Elsewhere in the text other footprints contain the quincuncial chevron pattern (51) already mentioned in relation to the floor tiling in the hallway of La jalousie.

Proceeding one level higher in the macrocosm, the space above the sidewalk is described as containing “flocons serrés [qui] descendent doucement, dans une chute uniforme, ininterrompue, verticale” (14-15). Introduced above in relation to the stack of crystals was the idea that the basic quincuncial structure can be applied to three-dimensional space. This function is easily achieved by placing one dot above the center dot of the quincunx and another dot below the center dot; the resulting three-dimensional figure is called a centered octohedron (Rucker 140). (see Fig. 3.5) The individual snowflakes falling in a regular vertical progression that fill the space above the ground of the city are arranged in this three-dimensional quincuncial structure.

An analogous three-dimensional space-filling tessellation constituted this time by dust particles is reproduced, en abyme, inside of the narrator’s
room (12). An analogous two-dimensional diagram of this tessellation is in turn reproduced by the wallpaper of the room. The wallpaper is described as a series of vertical stripes alternating between two different shades of grey. The lighter of the two stripes contains a vertical progression of tiny figures. These figures are described as "une sort de croix"; many variations are suggested as to the various objects that it possibly resembles (13). What is being described by the pattern on the wallpaper is, in essence, a quincuncial grid whose vertices are themselves a cross-like quincuncial figure. This cross-like quincuncial figure is physically present in the room in the form of the bayonet whose mark is also left in negative by the dust on the desk (13).

The parquet floor of the narrator's room is tiled in a series of chevrons (204). This pattern appears two other times in the text: as already mentioned in the quincunically hatched footprints in the snow on the street, and en abyme on the floor of the painting "La défaite de Reichenfels" hung on the wall of the room (204). The painting depicts a café whose tables are covered in the traditional red and white checked oilcloth. Superimposed on this chessboard

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le verre a laissé plusieurs traces circulaires, mais presque toutes incomplètes, dessinant une série d'arcs plus ou moins fermés, se chevauchant parfois l'un l'autre...(40).
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This intersection of arcs superimposed on a quincuncial grid has already
been described above in reference to the basic arabesque lattice in Figure 3.4. The presence of this pattern in the café scene reinforces the notion that interlacing arabesque structures are repeated on many scales of the fictional space.

The café scene in the painting gradually becomes animated and the thread of the narrative is woven back out into the snowy streets of the city. The final macrocosmic level in the frame of the text is the quincuncial labyrinth of the entire city sketched by the “entrecroisement de lignes” described “à angle droit” of the streets (15). That the maze of the city is itself a quincuncial grid is reinforced by the fact that the archetypal labyrinth of Crete was disposed along the same structure (Browne, 152).

Although I have above attempted to present them in a linear fashion, these quincuncial patterns superimposed on top of each other in the text actually follow a complicated non-linear disorder. Despite this inherent irregularity, a certain order can paradoxically be found amongst the general disorder of the text. Herein lies the harmony created by the use of a fractal mise en abyme; Robbe-Grillet presents the reader with a seemingly “chaotic” narration, but, at the same time, incorporates a subtle ordering force inside the text. We can thus point to a deterministic chaos in Dans le labyrinthe similar to how chaos theory finds ordered disorder in Nature. The continual interior duplications of the quincunx from the
labyrinth of the city all the way down to each individual snowflake can be rectified into a regular fractal object known as a Fournier Universe. (see Fig. 3.6) Although it would be impossible to recreate it fully on paper, the Fournier fractal denotes an infinite regress above and below of quincuncial groupings composed of quincuncial groupings composed of quincuncial groupings.

This shape was first proposed by Fournier D'Albe in 1907 as a possible model describing how an infinity of galaxies could be arranged in space in such a way so as not to produce a “blazing sky” (Mandelbrot 95). Another implication of the Fournier fractal is that if the universe can indeed be infinitely divided, as quantum physics is attempting to prove, and if

there is no smallest particle size, then any portion of matter contains the same infinitely many particles, so it would be possible for some small region of matter to look exactly like the entire universe (Rucker 139).

This brings the connection between the Fournier fractal universe and the fictional universe of *Dans le labyrinthe* into focus. Consider how the various levels of the fictional space represented by the street scene, the narrators room, and the café scene in “La défaite de Reichenfels” are all composed of the same essential parts. The hatched chevron pattern imprinted on the snow is reproduced on the floor of the narrators room
and again en abyme on the floor of the café. Likewise, the arabesque that is generated on the sidewalk also appears deeper in the text on the table in the café. The quincuncial forms of the arabesque are duplicated on every level of the textual universe implying an infinity of structural possibilities.

The ever-widening spheres in each section of the Fournier fractal universe relate to the third aspect of geometric Islamic art that is incorporated into the structure of *Dans le labyrinthe*: the “point at infinity.” On a purely formal level, every arabesque has at its foundation the notion of an initiating point. This point extends out to a ray that in turn rotates to define the circular domain of the two-dimensional artistic space (Critchlow 10-13). When this circle is extended out until it is infinitely large, it forms another point. Since a point is the smallest geometric object, the point at infinity is seen as being both infinitely large and infinitely small. Because this infinite circle can itself be rotated to create infinite three-dimensional space, the point at infinity encompasses and unifies the whole universe.

According to Islamic cosmology, the construction of the artistic space in the arabesque mimics the creation of space in our universe. By meditating on the fundamental structure of the arabesque it should be possible to regain indivisibility (God) at the point at infinity. The arabesque uses primary symbols in an attempt to operate outside of language, thereby
affording the observer a glimpse of the unity of dialectically opposite concepts such as beginning/end, cause/effect or subject/object (Critchlow 7). Every arabesque implies this metaphysics through its geometric forms. However, according to Robbe-Grillet, metaphysics is another “quelconque système de références” in which humans try to enclose Nature (Robbe-Grillet, Pour, 20). Since Robbe-Grillet denies that even metaphysics can unify subject and object (Man and Nature), it is consistent with his ideology that he would employ only the structural aspects of Islamic geometric art in his narrative. The point at infinity, which is fundamental to the construction of the arabesque’s artistic and metaphysical space, has only a material, structural value for Robbe-Grillet.

The structure of the ever-widening, all-encompassing circle rectifies how the infinity denoted by the fractal interior duplication in Dans le labyrinthé can coexist with a narrative space that is closed into the domain of a circle.6 The circularity of the fictional space in Dans le labyrinthé is established by the exclusive use of the first person at the beginning and end of the novel. The first word of the text is “je”, and the first person is not

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6 Robbe-Grillet’s unrealized first novel was going to be based on the tale-biting snake Ouroborus, whose 108 scales correspond to a Fibonacci-like set. Although the novel was never completed, Robbe-Grillet preserved both the circular plot structure and infinite loops in all of his novels (Morrissette, The Novels, 38-39).
used again until the final word “moi” establishes the circular domain of the fictional space. It is important that this circularity is effectively only duplicated once in the novel by the image of the fly walking in an infinite loop around the top of the lamp shade in the narrator’s room (14). Since the narrator’s room is relatively situated between the macrocosm of the city outside and the microcosm of the picture inside, we can posit it in the center of the frame of the multi-scaled narrative space. Because the entire text is modelled after the construction of Islamic geometric art, the image of the fly walking around the lamp shade is the initiating point of the novelistic arabesque. This initiating point then expands outward to encompass the circularity of the whole text.

The entire structure of the novel is itself verified by one simple mise en abyme: a cross inscribed in a circle with a smaller circle “de très faible diamètre” marking the intersection of the cross is imprinted in the snow by the heel of a footprint (51). This one symbol contains the three basic generating elements common to both the arabesque and Dans le labyrinthe: self-similarity, a quincuncial arrangement, and a point extending out to define an infinite circular domain.

The omnipresence of the arabesque and quincuncial forms reveals three essential parts of Robbe-Grillet’s scientific aesthetic. First, his use of mise en abyme departs from traditional interior duplications by
recognizing a potential infinity of microcosmic levels below the frame. Second, this fractal self-similarity helps construct pure self-referential texts that both rejects ideological systems exterior to the text and aids a scientific investigation of the interior of things. Third, these various fractal mises en abyme provide the structure around which Robbe-Grillet organizes the disorder of an entire text.
Chapter IV

Pôles Organisateurs: strange attractors in Robbe-Grillet’s narrative.

Order per se is not art, and neither is complexity, but the finding of order in complexity is (227).
- Cyril Stanley Smith

In Chapter three I showed that the structure of the fictional space of Dans le labyrinthe is identical to the structure of the artistic space used to generate the patterns of the arabesque. Although on the surface the structure of the text appears to be random and disordered, there exists an underlying order with which the scenes and themes interact. The deep structure of the novel was shown to be organized along a self-similar, quincuncial arrangement that is “enclosed” in an infinite circular domain. This aspect of the novel is its organizing force that holds together and gives structure to an otherwise disordered system of narration.

Robbe-Grillet was conscious of the dynamic interaction between order and disorder in his novels. According to him, “chaque ordre a son désordre et chaque désordre peut se considérer comme un ordre”, and on the boundary between these two forces he named “pôles organisateurs” around which the ordered and disordered aspects of his texts revolve and interact (Ricardou, ed., 134). Various “pôles organisateurs” are found in
every one of his early novels, but in *La jalousie* the interplay between order and disorder is the most vibrant and creative.

*La Jalousie*, whose appearance scandalized the literary circles of the day, presents the reader with a very complicated and seemingly disordered text. Robbe-Grillet’s narrative order was so foreign to the readership of the 1950s that *Le Monde*’s literary critic wrote that he must have been sent a copy that had been mixed-up by the printer (Robbe-Grillet, *Order*, 3).

On one level the whole novel can be seen as a tension between the order that the absent narrator attempts to impose on his surroundings, and the chaos that in every scene threatens to erupt out of the narrative and disrupt his fragile system of evenly spaced banana plants and productive workmen.

Robbe-Grillet achieves this “chaotic” narrative in a number of ways. The chronology and the narrative thread of the novel are intentionally shattered so that it is impossible to reconstruct a coherent story in the traditional sense. Every detail of the novel is oriented toward contriving the fragmented plot. The novel takes place in an equatorial location where there are no seasons, the sun rises and sets at the same time every day and the banana harvest is continual thereby eliminating any climatic or cyclical point of reference. The only possible temporal marker is the sun dial created by the pillars on the corners of the house, but even this chronological reference is effectively nullified by the other causal
ambiguities of the text.

The sequence of the scenes in the novel are also left intentionally vague if not completely jumbled. For example, the placement of the crushing of the centipede is designated as “la semaine dernière, au debout du mois, le mois précédent peut-être, ou plus tard (Robbe-Grillet, jalousie, 27). The same scenes are repeated randomly with variations, and more complicated still, contradictions are built into the text that resist the reconstruction of a sequential plot along traditional lines. The thread linking one scene to the next seems completely illogical and random. Descriptions of the cultivated plots of bananas shift abruptly to a detailed description of A… brushing her hair; which shifts to descriptions of the balustrade; which alternates to an interior duplication in the form of the second chauffeur’s song; which leads to a scene where the absent narrator, A… and Frank are eating dinner; which gives way to a scene where the centipede is crushed; which gives way to… The sequence of scenes disrupts the chronological and causal consistency of a traditional balzacien narrative order.

Complicating the text even further is the fact that each individual scene itself contains a set of objects or themes that are themselves present across scenic boundaries in various permutations throughout the text. Given this tangled web of descriptions and scenes it would be convenient
but imprudent to reject the entire narrative structure as meaningless and chaotic.

Despite this apparent non-linear and chaotic structure, Robbe-Grillet says that he spent two years constructing an exacting formal system for the novel. He describes La jalousie as containing an “extraordinarily precise formal organization” and a “fine narrative order” that, rather than exhibiting total chaos, has a deep structure that is an alternative to traditional narrative order (Robbe-Grillet, Order, 3). The pôle organisateur that Robbe-Grillet names as providing this order in the midst of chaos is the scene describing the orbits of insects around the oil lamp (Ricardou, ed., 133). This organizing force in La jalousie bares a striking resemblance to the strange attractors of chaos theory that were developed years after the novel was written.

The description of the orbiting insects ostensibly occurs when Frank and A... are in town and the absent narrator is alone in the house. Their “vols cycliques” are described as taking place in “une zone commune, violemment éclairée, longue d’un mètre cinquante environ”, and the insects themselves “ne sont que de simple particules en mouvement qui décrivent des plans horizontaux, ou d’inclinaison très faible, coupant à divers niveaux le manchon allongé du lampe.” Regarding the orbits, “les variations sont probablement incessantes à l’intérieur de l’essaim” and, because it is
impossible to observe individual orbits, “une certain permanence
d’un ensemble s’établit au sein de laquelle les crises locales, les arrivées, les
départs, les permutations, n’entrent plus en ligne de compte.” Sometimes
the orbits are utterly chaotic, but “par un brusque écart, l’élément
générateur reprend une gravitation plus calme.” Despite these variations
the insects

continuent de tourner les ellipses, s’allongeant, se rétrécissant,
s’écartant vers la droit ou la gauche, montant, descendant ou
basculant d’un côté puis de l’autre, s’emmêlant en un écheveau
de plus en plus brouillé, ou aucune courbe autonome ne
demeure identifiable (Robbe-Grillet, jalousie, 147-154).

This intricate description of a complicated interweaving of insect
orbits is an interior duplication because the various scenes in the novel
revolve in an identical manner around the mental landscape of the absent
narrator (and the view of the reader) thereby forming the dense tangled
“écheveau” of the narrative. If each insect were assigned an aspect of the
novel (either a scene, an individual description within a scene, or the
objects within a description) then it is possible to envision how the entire
novel assumes this interwoven, non-linear form described by the insect’s
orbits. The incessant variations and the random patterning of the insects’
elliptical orbits are in direct proportion to the non-linear narrative
structure of the entire novel.\textsuperscript{1} However, classifying the scene as a mise en abyme only goes so far in explaining how, as a pôle organisateur, it arranges the chaos of the narrative. By infusing the philosophy and the vocabulary of chaos theory into the analysis of this pôle organisateur, a deep-structured order will emerge out of the narrative chaos in the form of a strange attractor.

The strange attractor inhabits a mathematical area called phase space. Phase space diagrams for non-chaotic systems that repeat themselves continuously or achieve a steady state are easy to imagine. A frictionless swinging pendulum can be reduced to two variables: position and velocity. The continuous regular exchange of these two variables can be plotted on a Cartesian plane to form an endless loop. (see Fig. 4.1) As velocity and position increase, the loop in phase space will expand, but it will maintain the same circular shape regardless of the energy exerted on the system. When friction is added to the equation, the pendulum will naturally slow

\textsuperscript{1} When insects fly around a lamp, the trajectory of their approach to the light source is actually that of a logarithmic spiral (see Thompson 756). Using the scaling factor equal to the golden section, the logarithmic, or equiangular spiral, scales down toward infinity using constant proportions. The presence of the logarithmic spiral’s smooth self-similarity in the interior duplication of \textit{La Jalousie} reinforces the harmonious proportion of the insects flight to the self-similar narrative device of mise en abyme used by Robbe-Grillet. The description of the orbits of the insects in \textit{La jalousie} is an interior duplication that itself contains an infinite regress.
down and fix itself to one point: the resting position. The process of the system’s gradual loss of energy is portrayed in phase space as a spiral that attracts itself to one point: a state of rest where both velocity and position are zero. Phase space diagrams turn numbers and data into pictures that enable us to visualize a system’s behavior (Gleick 134-137).

When chaotic systems are plotted in phase space the result is a strange attractor. Chaotic dynamical systems are sensitive to a potentially infinite number of variables, but, in the interest of clarity, the variables are usually reduced to three when plotting in phase space; most humans are not yet capable of visualizing four or more dimensions. Phase space diagrams depicting more than three dimensions are extremely complicated but not outside of our analytical reach. In phase space our entire knowledge about the system at a given moment is collapsed into one point. The position of that point tells us where the system is in relation to the variables that are being measured. Because the system is chaotic, the point will change its position randomly as it orbits around the system. By tracing the trajectory of the point around the system, a shape is created that enables the researcher to visualize the variables’ random behavior. The strange attractor is said to organize chaos because, although every orbit has potentially infinite variations within the system, there are a set of points and orbits to which a system is mysteriously drawn. The strange attractor
paints a deterministic picture of a chaotic system: at once random and
deliberate, ordered and disordered (Gleick 134-137).

The strange attractor in Figure 4.2 represents the chaotic behavior of
a rotor (a pendulum swinging in a full circle) that is driven by an energetic
“kick” at regular intervals (Gleick 143). After the system has gone
through thousands of orbits, the strange attractor appears from the outside
to be a tangled “écheveau” of lines called a torus. Although no two orbits
are exactly alike, the torus represents the points (numbers) to which the
system’s behavior is drawn. Since the complexity of the torus is impossible
to analyze from the outside, a two-dimensional cross-section called a
Poincaré map is taken out of the three-dimensional knot of orbits. This
enables us to view the phase space from a different angle; every time the
orbit of the system passes through our two-dimensional screen, it leaves a
point. As the system orbits chaotically in phase space, the points draw a
shape. The shape on the Poincaré map of a strange attractor depicts the
system’s behavior in one instant of time. It is then the role of the
investigator to make a mental abstraction that connects the data pictured on
the Poincaré map back to the system itself.

In the analysis of the Poincaré map many aspects of deterministic
chaos come to the fore. The shape on the Poincaré map is a fractal because
it exhibits self-similarity on many levels. (see Fig. 4.3) If we zoom in on
any line on the map it reveals that it is actually made up of a series of smaller lines; this fulfills one of Mandelbrot’s main criteria for a fractal, that a loop be decomposed into the union of other loops.

Figure 4.4 shows a cross-section of a portion of the Ueda strange attractor. This shape appears when dynamical systems as varied as the oscillation of a magnetic field to the rise and fall certain types of predator and prey populations are plotted in phase space (Briggs 142). The yellow portions at the heart of the map represent areas of the system to which the behavior is more frequently attracted while the red lines represent less frequent behaviors exhibited by the system. This coloration accounts for various degrees of chaos; inside of a completely disordered system, it is possible to have stable (more regular) chaotic orbits and unstable (less regular) chaotic orbits.

The Ueda attractor depicts another important aspect of chaos theory: a topological phenomenon known as the “baker’s transformation”. The Poincaré map reveals that the interior of the torus appears to have been stretched and folded resembling different colored dyes being stirred into cake batter (Briggs 142). This produces an intricate layering of the system in which it is continuously folded into itself. The mathematical

\footnote{see the description of “Smale’s Horseshoe” in \textit{Chaos} by James Gleick (49-53).}
implications of the Baker’s transformation show that the chaotic system is sensitive to initial conditions. For example, the orbits that are close together in time do not end up close together spatially on the cross-section. Similarly, two orbits that were initially far apart temporally may end up close together spatially. This tells us that even if we know the starting coordinates of an orbit it is impossible to predict the behavior of the system at any given moment in the future. The strange attractor allows us to visualize the deterministic nature of chaos. This brief and simplistic description of a certain type of strange attractor will enable us to draw the comparison between Robbe-Grillet’s pôle organisateur and the mathematical object that organizes chaos.

From looking at Figures 4.1 - 4.4, some similarities between La jalousie’s pôle organisateur en abyme and a strange attractor are immediately recognizable. On the level of descriptive language, there is a similarity between the vocabulary that Robbe-Grillet uses to describe the insects’ orbits (“brouillé” and “écheveau”) and the words that Gleick uses thirty years later to describe a similar strange attractor (“tangled” and “skein”) (Gleick 143). Because of the infinite and undefinable variables that create a text, it would be impossible to physically plot a strange attractor that exists in narrative space. Taking into account this dimensional obstacle, the analogy linking the two concepts requires a
similar mental abstraction that the chaologist makes to connect the contours of the strange attractor back to the dynamical system. The mental abstraction required to create fictional phase space might be described as such: a text is a three dimensional stack of two-dimensional pages. These two-dimensional pages contain a string of coded symbols that provoke the creation of fictional space inside the mind of the reader. Fictional space inhabits an area of the mind called “the imagination”. Because this fictional space exists outside of physical dimensions, it is free to take on whatever dimension the text elicits.

The fictional phase space of the textual strange attractor is etched out of La jalousie by the “zone commune, violemment éclairée” created by the oil lamp (148). The novel is a complex dynamical system that traces the change of the mental landscape of the absent narrator over time. Since the pôle organisateur is an interior duplication, the deterministic chaos of the flight of insects around the lamp can be extended to the macrocosm of the entire text; this allows us to analyze the text and the pôle organisateur simultaneously. Each scene can be viewed as an individual orbit around the fictional phase space. As the narrative thread loops around the mental space of the absent narrator (and the reader), its complicated random orbits are attracted to a certain set of behaviors which eventually traces the “écheveau de plus en plus brouillé” of the novel’s structure (153). Because
“les variations sont probablement incessantes dans l’essaim” of insects (and of scenes), the whole narrative structure leaves the impression of being the tangled torus of a strange attractor. The torus drawn by the orbiting insects depicts the chaotic behavior of the entire novel.

Were the reader only allowed an exterior view of the tangled skein of the narrative, then the structure of the textual chaos would be impenetrable. One could then dismiss the novel, as did the critic for Le Monde, as a purely disordered contrivance that does not interact with the reader to produce a meaningful system. However, Robbe-Grillet gives the reader an interior view of the system via the mental screen of the absent narrator. This interior view into the chaotic narrative torus allows the reader to rectify the disordered structure of the novel into a portrait of deterministic chaos. The absent narrator records the orbiting scenes in the same way that the two-dimensional cross-section taken out of the torus of a strange attractor registers the orbits of the dynamical system. Through this process, the novel itself becomes the Poincaré map of the chaotic orbiting of the narrative thread.

Gleick describes the process of creating a Poincaré map as one that “removes a dimension from an attractor and turns a continuous line into a collection of points” but in doing so “preserve[s] much of the essential movement” of the system (Gleick 142). As the narrative thread orbits
around the fictional space with its incessant variations, it strikes the mental screen of the absent narrator (and the reader) and leaves an impression or a point on the text. Every detail in *La jalousie* (each change of scene, each variation of the same scene, or each object that constructs the scene) represents a point on the mental screen of the narrator where the orbit of that textual aspect has passed through it. The mental screen of the narrator, and in turn the text itself, becomes this two-dimensional slice out of the chaotic narrative torus in fictional space that functions to reveal the deterministic chaos of the textual dynamical system.

Viewing the text as a Poincaré map of the system of orbiting scenes endows the pôle organisateur in *La jalousie* with the ability to organize an otherwise random, non-linear narrative. The aesthetic and philosophy proposed by chaos theory gives us the vocabulary to define the order amidst the narrative chaos. This organizing force on the boundary between order and disorder rectifies four structural aspects of the text which on the surface appear to be purely chaotic: chronology, causality, the variations among scenes and Robbe-Grillet’s “thematic reservoir” of objects.

In the description of the baker’s transformation in relation to the Ueda attractor, it was shown how a Poincaré map portrays the system at one moment in time as a collection of “snapshots” (points) that are continuously folded into each other. This brings out the chaotic flavor of
the attractor: orbits that are close together in time do not necessarily end up spatially close on the Poincaré map. Rather than view *La jalousie* as a random collection of fragmented scenes, we are prepared to define the chronology of the text as containing a “fine narrative order” that is embedded in the disorder of the scenes. The novel represents a single instant of space-time in the mental landscape of the absent narrator that is a collection of infinitely variated snapshots. The multi-layered cross-section of the fictional space is the result of a topological transformation brought on by the continual folding of scenes into one another. Therefore, the topology of the narrative is not “shattered” or “fragmented”, but infinitely layered and contoured by a process of folding. This describes how a scene that is chronologically close together in the fictional space appears spatially far apart in the text. Likewise, scenes that obviously occurred far apart in the actual chronology of the fictional space occur next to each other in the text. For example, we can imagine that the crushing of the centipede happened months before Frank and A…’s trip to the port, but as these scenes randomly orbit around the mental landscape of the absent narrator, they are registered in close proximity on the text and appear to be folded into one another. Taking this infinitely folded textual topology into account, it is clear that even if we know the starting point of an orbit, say the description of the shadow of the southwest pillar, we have no idea
where we will end up in the text at any future time. We are able to describe the chaotic process of the narrative but not predict it.

Describing the text as a Poincaré map similar to the Ueda attractor also enables us to delineate various degrees of randomness and chaos among the orbiting scenes. Robbe-Grillet accounts for this determinism inside of chaos by describing the activity of the insects’ orbits as eccentric, and then “par un brusque écart, l’élément générateur reprend une gravitation plus calme” (149). Relatively stable scenes such as the descriptions of the banana plantation and the house, although variated and randomly situated in the text, would fall into the yellow portion at the heart of the Poincaré map (see Fig. 4.4). Scenes with a high degree of variation and irregularity such as the many centipede deviations, the descriptions of the various stains (taches), or the descriptions of the African novel would fall into the red zone on the cross-section. The infinite variation of scenes are organized into different degrees of regularity and irregularity, stability and instability when we consider them as a collection of points on the textual Poincaré map.

Another important aspect of a Poincaré map that organizes the narrative chaos of La Jalousie is its fractal dimension. By zooming in on the scales of the Hénon attractor (see Fig. 4.3), it was shown that what appears to be a line on a macrocosmic scale is actually a collection of
smaller lines on the microcosmic scale. This scaling process could theoretically be carried out infinitely because the orbits in phase space actually have zero “thickness” (Hayles 150). Because the resulting collection of zero-thickness points into zero-thickness lines can be infinitely folded into each other on the Poincaré map, any loop can be decomposed into a union of other loops. Since the narrative of La jalouse undergoes an identical continuous folding, this self-similar fractal dimension can be used to structure the objects in Robbe-Grillet’s “thematic reservoir” that appear randomly across scenic boundaries.

For example, consider that the original pôle organisateur is described as the elliptical orbits of insects. The orbit of insect descriptions can be decomposed into loops of other insect descriptions such as the crickets that produce a deafening sound (138), the termites that threaten to destroy the wooden foot bridge (103), the spider whose webs shimmer in the dewy garden (79), the moth’s shadow that is possibly responsible for creating the impression of a fleeting smile on A…’s face (27), the buzzing of the scarab beetle (27) and the centipede. The twelve centipede variations, which represent the most chaotic and productive orbits in the text, can be broken down into a number of different loops. For example, the magnified sound of the centipede’s legs against the wall is equated with a brush going through hair (164-165) which forms a loop with the many
detailed descriptions of A... brushing her hair.

The centipede orbit could equally be decomposed into another productive series of loops: the stain variations. These include the mysterious red stain on the flagstones that surround the house (210), Frank’s white shirt which is described as a stain on the black field of the wall at night (58), the stain on the table cloth at Frank’s place (145), the purple stain of the night sky framed by the window (137), the little stains that the insects create as they orbit around the lamp (198) and the stain of A...’s illuminated image burned into the retina of the absent narrator which is projected all over the fictional landscape (140-141) - to name only a few. The orbiting of stains around the fictional space can in turn be decomposed into a set of loops incorporating the erasure of stains. These orbits would include the scenes of A... erasing something on a piece of paper (134), the erasure of the black oil stain on the driveway by a defect in the window (127) and the meticulous erasure of the centipede’s stain from the wall of the dining room using eraser, fingernail and razor blade (129-132).

The possible origin of Robbe-Grillet’s stain variations is Leonardo da Vinci’s recommendation that stains on walls could provide the artist with inspiration and material: “in such a stain various inventions are to be seen” and “if you look at any walls soiled with a variety of stains [...] you will therein see a resemblance to various landscapes...” (Kemp, ed., 200 and 220).
The razor blade bent in the shape of a curved V is used to smooth down the rough area created by the erasure of the centipede (131). This V shape can be decomposed into a series of loops that include the continuous Vs in the chevron pattern on the floor of the hallway (162) and the boarder between the plantation and the jungle (33), the curved V made by the logs on the ground destined to become the new footbridge (118), and the curved V shaped wings of the beetle that flies back into the swirling tangle of insects and brings us back to the original orbit of the pôle organisateur (151). The series of loops that I have arbitrarily decomposed could theoretically be carried out infinitely to organize the entire text into one fractal shape. This shape’s analytical value would be to depict the deterministic chaos of Robbe-Grillet’s narrative order. The textual strange attractor en abyme represented by the flight of insects around a lamp in fictional space depicts a narrative dynamical system “whose behavior never repeats itself and is always unpredictable and yet, paradoxically, always resembles itself and is infinitely recognizable” (Briggs 143). By using the vocabulary and aesthetic of chaos theory, I have shown how Robbe-Grillet’s pôle organisateur in La jalouse organizes the narrative chaos and gives a subtle structure to a system that is random and disordered.
The first mathematical strange attractor was created by Edward Lorenz in 1963, six years after the publication of La jalousie. Chaos theory came out of the 20th century primordial soup twenty years later when Mandelbrot began to formalize the shift in point of view that had already begun to develop in random places around the scientific community. The presence of pôles organisateurs that resemble strange attractors and self-similar fractal structures in Robbe-Grillet’s early novels verifies the capability that Art possesses to precede and influence science. Robbe-Grillet’s early novels represent a self-conscious, extreme departure from the 19th century artistic and scientific ideologies that innovators such as Gide and Cantor had initiated. He wrote novels as a scientist, and in doing so assumed a narrative tone that was scientific in its structure and theory. Given the historical precedent for the artist-as-catalyst for scientific and technological advances provided by Cyril Stanley Smith, one can explain Robbe-Grillet’s interaction with chaos theory as follows: Robbe-Grillet had contact with the elements of the 19th century crisis in
science and mathematics (Cantor’s set theory, Poincaré’s conjecture, Peano curves, and Koch islands) and he synthesized these with the 20th century world-view that was developing in post-World War Two civilization as a result of Einstein’s theories, quantum physics, and Gödel’s Incompleteness Theorems. When further infused with artistic motivation, the result of this interdisciplinary experiment was an aesthetic and philosophy that was a precursor to that of chaos theory.

Chaos theory in turn produces a set of vocabularies that enables the critic to use a new frame of reference in an analysis of Robbe-Grillet’s early novels and (counter)ideology. This latest shift in our perception of the universe provides an aesthetic and philosophy that enables us to better describe chaotic and non-linear elements in the scientific and artistic venues. To what extent this shift represents an evolution or a revolution in human understanding remains to be seen, but one thing remains clear: neither artists nor scientists operate in a cultural vacuum. Robbe-Grillet’s early novels are one more piece of evidence in human history that establishes the fertile interaction between a work of art, science, and the culture in which both of them evolve.
Appendix

Figure 1.1 Self-similarity as we zoom in on the Mandelbrot set from John Briggs, *Fractals: the patterns of chaos* (New York: Simon and Schuster, 1992) 77-80.
Figure 3.1. The golden proportions of the Parthenon and a corresponding logarithmic spiral from György Dozzi, *The Power of Limits* (Boston: Shambala Publications, 1981) 108.
Figure 3.2. The basic quincuncial arrangement from Thomas Browne, *The Garden of Cyprus* (Oxford: Oxford University Press, 1972) 138.

Figure 3.3. The snowflake's fractal self-similarity from György Dozci, *The Power of Limits* (Boston: Shambala Publications, 1981) 79.

Figure 3.5. A centered octohedron displaying a three-dimensional quincuncial arrangement from Rudy Rucker, *Infinity and the Mind* (Princeton: Princeton University Press, 1995) 141.
Figure 4.1. Phase space diagram of a pendulum driven at a constant rate (left) and running down as a result of friction (right) by Andrew Christie from Crutchfield, Farmer, Packard and Shaw "Chaos" (Scientific American, Inc., 1986); rpt in N. Katherine Hayles, Chaos Bound (Ithaca: Cornell University Press, 1990) 148.

Figure 4.2. The chaotic tangled skein of a strange attractor and the Poincaré map that reveals its organization from James Gleick, Chaos (New York: Viking, 1987) 143.
Figure 4.3. Fractal self-similarity in the Hénon attractor from James Gleick, *Chaos* (New York: Viking, 1987) 150.
Figure 4.4. The Poincaré map of the Ueda strange attractor. The gold portions display more frequently exhibited behavior by the system from John Briggs, *Fractals: the patterns of chaos* (New York: Simon and Schuster, 1992) 142.
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