Openings: the Act of Modelizing and the Question of Complexity

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1 Entering Richard Powers’ novels, the readers get immediately plunged into a highly organised textual system, where a lot of references, both direct and indirect, are made to structural characteristics that seem to apply to the very nature of the system they discover. At first sight, these self-references tend to imply that a set of formal constraints should be ruling the overall composition of the text, which precisely fits Powers’ description of the way he maps out the structure of his novels:

Each of my novels have sought, in their formal constraint, the same kind of structural mirror that would release the themes for their stories. Each of the nine books finds its generating principle in a structure that is quite different from any of the other books.

2 Installing metaphorical deterministic models as literary devices could thus be seen as a way of organizing the novel’s structure. How are those models introduced in the text, what are they, and how can their impact on the development of the novels be assessed? Examining the formal features presented in the openings, recurring elements progressively emerge, informing the readers not only on the type of esthetic frame that is proposed, but also on the nature of those great structuring principles that were selected by the author. As soon as one gets confronted with this particular space, repeated metaphorical patterns taken from the field of information science help define what could be called a “programmatic function” of the openings, as if they encapsulated a series of coded instructions meant to launch the execution of related processes in the development of the textual system.

3 This programmatic tendency, the most blatant example of which certainly comes from The Gold Bug Variations’ opening, can in most novels be detected from the first page, even before the narrative actually begins, that is from the first semiotic stage of the epigraph.

4 Epigraphs are to be found in six of Powers’ novels, in the indeterminate area located in-between the pre-existing world of the readers and the oncoming fictional world they give access to as primary portals. Their brevity and variety generally open up several
interpretive paths simultaneously, giving the readers the impression that, more than providing the textual system to come with a theoretical or cultural background, they help set up structural guidelines which will frame the novel’s development and modelled functioning as a system. The epigraphs notably highlight the common characteristics of all complex systems, as Ludwig von Bertalanffy first defined them in his *General System Theory* published in 1968, thereby associating the textual system with those very informational open systems. Von Bertalanffy’s system theory, which consisted in a radically new approach to living systems, severed from then-prevalent mechanistic principles and contributed to a paradigm shift in the theory of knowledge based on a series of epistemological redirections whose later development in the 1970s helped give birth to chaos theory. In the 1980s, literary critics and theoreticians such as N. Katherine Hayles, William Paulson and Tom LeClair took up the tropes supplied by those new sciences as tools for a new approach to literature, LeClair coining the phrase “systems novels” to describe the functioning of fiction masterworks by different authors such as William Gass, Robert Coover, Don DeLillo or Joseph McElroy, to name but a few. I would like to argue here that those tropes may apply to Powers’ novels and help understand the openings’ structural impact on his texts. Nonetheless, focusing on the openings also makes it possible to point out functional variations, which appear to be essential to the ongoing creation of complexity throughout the novels. While programmatic virtues evidently stand out in the openings, disorienting elements also emerge, forcing the readers to reconsider the scope of the models at stake in the writing.

Among those new features characterizing open systems, some which are explicitly present in the epigraphs can be summed up as follows:

- because living systems are dynamic processes that combine energy and information in reciprocal relation, the systems are not separable into parts but must be considered as wholes
- linear chains of cause and effect cannot adequately describe the circular causality of living systems, which are open and interacting with other systems
- the processes of open systems are ‘equifinal’: end results cannot be determined or predicted from initial conditions. (LeClair, 8)

The epigraph of *Three Framers on Their Way to a Dance* introduces the two following quotations:

> We guess as we read, we create; everything starts from an initial mistake... A large part of what we believe to be true... with a persistence equalled only by our sincerity, springs from an original misconception....—MARCEL PROUST,
> *Remembrance of Things Past*

> “Everybody,” said Knudsen, explaining the demand for the automobile, “wants to go from A to B sitting down.”—ANNE JARDIM, *The First Henry Ford: A study in Personality and Business Leadership*

Through Proust’s quotation, the author insists on seeing the reading process as a creative activity and questions the legitimacy of a representation based on belief, since all mental constructions are considered as deriving from a “misconception”. The readers thus get indirectly warned about the kind of structure favored by the novel itself, since many parallels can be drawn between Proust’s sentence and the structure of *Three Farmers on Their Way to a Dance*. The three branches making up the narrative effectively all rely on the selfsame principle of the “initial mistake”: in the first one, the I-narrator comes across the eponymous photograph in Detroit and is dazzled by the vision of those three young men. He finds himself compelled to undertake a long investigation in an effort to
provide some explanation for his intuitive response to the haunting image. But his quest soon appears to be influenced, not to say thwarted, by a double initial mistake in the picture’s identification tag (August Zander, Austrian): the spelling of the surname, and the nationality. Consequently, the second narrative thread, which relates the lives of those three men, can only be seen as actualizing Proust’s line, as it consists in a creation resulting from an original misconception. Similarly to the first, the third narrative originates from two initial misreadings by Peter Mays who instantly falls in love with a vision: a woman holding a clarinet he sees from his office as he watches a street parade on Veterans’ Day. On his way to finding the redhead musician, he comes up against a double original mistake: she is dressed up as Sarah Bernhardt, so the color of her hair is part of her costume for the occasion, and the instrument she is holding is not hers.

This first epigraph is therefore used as a structuring model that organizes the multi-layered narrative development of the textual system. More than that, it works as a carrier of formal instructions which directly refers to the new series of paradigms set up by systems theory, since it foregrounds one of its main principles which was subsequently taken up by chaos theory, that is equifinality. Indeed, equifinality can be related with the phenomenon named “sensitive dependence on initial conditions”, more widely known as the “Butterfly Effect”, which states that small initial changes in a complex system may result in large differences in the final state of the system.

The epigraph’s second quotation introduces a temporal, spatial and genre break with the first, since no apparent connection can be made between the two. Associating two different genres (as is also the case in the double epigraphs of Prisoner’s Dilemma and Plowing the Dark) gives the readers a sense of hybridity which brings to mind Bertalanffy's primary motive in creating his groundbreaking systemic approach: his ambition to “formulate a way of apprehending the world that could cross disciplines.” Here, a metaphorical relation between the two quotations emerges from their common dynamic aspect: the act of reading is thus presented as a physical displacement of the engager from point A to point B. This interpretation also gets reinforced by the novel’s title (“on their way to”) and by the first chapter’s title (“I Outfit Myself for a Trip to Saint Ives”), locating the photographed men, the first-person narrator and, by metatextual extension, the readers, at point A, that is the starting point of their literal and metaphorical journeys.

The structural impact of the double epigraph can then be summed up as follows: by delineating an unstable and unpredictable development, the epigraph invites the readers to question the validity of linear processes (allegedly founded on error) so as to favor non-linear dynamics, which is typical of complex systems (chaos theory is even sometimes called the science of non-linear systems). Effectively, non-linear processes are to be found at every level of the textual system's hierarchy: in the internal metaphorical motifs used (for instance the dance, the trigger point, and the salmon perversity), in the continuous reciprocal transfers of information between the three stories which progressively braid them together, or in the global ternary structure of the narrative. The latter incidentally appears in several other novels (Prisoner’s Dilemma, The Gold Bug Variations, Operation Wandering Soul, Plowing the Dark), a consistency which seems all the more relevant to the context of complex systems theory since it features a principle highlighted by mathematician James Yorke in an article entitled “Period Three Implies Chaos”. In this publication, Yorke shows that any system with a regular cycle of period three will also display completely chaotic tendencies.
Similarly, the first part of P's epigraph encapsulates the same kind of structural leads:

I am still puzzled as to how far the individual counts: a lot, I fancy, if he pushes the right way.—T. E. LAWRENCE

Here again, the epigraph exhibits yet another noticeable specificity of complex systems by creating a tension between the individual and the society at large, which can be read as putting an end to linear chains of cause and effect on behalf of emerging conflicting scales. The struggle between local and global scales staged by the double epigraph announces a structuring dialectics which cancels out the traditional relations of linearity, as noted by N. Katherine Hayles in her *Introduction to Complex Dynamics in Literature and Science*:

chaotics takes scale into account, recognizing that for complex systems and irregular forms, statements made about one scale do not necessarily hold true at another. Moreover, it emphasizes that couplings between levels are complex and unpredictable. (Hayles, 8)

Besides, the quotation by Lawrence also raises the question of the individual power and thus focuses on the critical issue of authority. This can be metafictionally interpreted as questioning the power of the author and various narrators over the text, especially as P is one of the novels where uncertainty often prevails as far as narrative points of view are concerned. The novel indeed appears as a collective narrative relying on several voices which by and large prove difficult to identify and isolate one from the other.

The introductory strategy of *The Gold Bug Variations* goes even further. The title itself is a program announcing from the start the merging of two distinct structuring models through homonymous qualities: Poe’s short story “The Gold Bug” and Johann Sebastian Bach’s musical masterpiece “The Goldberg Variations”. The literary model hinges on the progressive deciphering of a coded message leading to a concealed treasure, while the musical model essentially puts forward the contrapuntal writing technique. The hybrid organization of the text gets thereby heralded as a mixture of two models involving different rules: the first obeys a linear and gradual development (through the accumulation of deciphered unities), the second an evolution based on replication and displacement combined, giving way to a spiralling structure. Although it is not openly present from the title, the third prevalent model to the narrative (that of the DNA) encompasses elements from the other two: it proposes a code which has yet to be deciphered and consists in a spiral (the famous double helix) in which genes allow for the process of replication, one of the basic principles of the genetic code (along with language) being redundancy. The novel’s epigraph thus stresses the central common point between those three models (that is the act of code-making and -breaking) by presenting a cipher which reads as such:

```plaintext
RLS CMW DJP RFP J?O CEP JJN PRG
ZTS MCJ JEH BLM CRR PLC JCM MEP
JNH JDM RBS J?H BJP PJP SCB TLC
KES REP RCP DTH I?H CRB JSB SDG
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On the whole, the fundamental metaphorical construction of the novels is promoted by Powers in the epigraphs, encouraging the readers to associate open systems with the structure of the texts. This also appears in *Galatea 2.2* through Emily Dickinson’s poem on the brain, typically a complex open system:
The brain is wider than the sky, For, put them side by side,The one the other will containWith ease, and you beside.
The brain is deeper than the sea,For, hold them, blue to blue,The one the other will absorb,As sponges, buckets do.
The brain is just the weight of God,For, heft them, pound for pound,And they will differ, if they do,As syllable from sound.
—EMILY DICKINSON

The founding brain metaphor, which is used throughout the novel as an analogue both for the computer and the textual system, is first infused through Dickinson's poem and foretells the constant self-referentiality of the textual system, its analogic nature and the multiple layers of embedded narratives that are to be found.

The epigraphs therefore clearly play a programmatic part inasmuch as they introduce the metaphorical models that are to be used to shape the composition and evolution of the texts: chaotic systems in (Three Farmers on Their Way to a Dance), tensions between genres (Three Farmers on Their Way to a Dance, Prisoner's Dilemma and Plowing The Dark) and scales (Prisoner's Dilemma), or founding metaphorical structural patterns (the brain in Galatea 2.2 and The Echo Maker, genetics and musical counterpoint in The Gold Bug Variations). As formal qualities repeatedly get promoted in the epigraphs, the texts are presented as dependent hierarchies and heavily constrained systems.

As opposed to that first framing gesture delineated in the epigraphs, the novels' opening sentences seem at first sight to have contrary influences, in terms of modeling. Beyond the natural impact resulting from their strategic location, they all appear to share prominent common features.

First, all of them overtly aim to appeal to the readers (which is not specific to Powers), most of the time by resorting to puzzling forms, such as the paradoxical initial statement that opens Galatea 2.2 (“It was like so, but wasn’t.”), the bold grammatical construction in Operation Wandering Soul (“Kraft cruises down the Golden State: would it were so.”), the syntactic beautiful elaborate structure of Gain (“Day had a way of shaking Lacewood awake.”), or again the intriguing indetermination of Plowing The Dark (“This room is never anything o’clock.”). The Aria opening The Gold Bug Variations proposes a more complex form as it uses structural elements present in Bach’s introductory piece to give shape to a dense poem, nonetheless starting with the following disconcerting question (especially when applied to the novel): “What could be simpler?”.

While those entries show variety in their textual contexts (there might be an epigraph or not, a subtitle or not) and in their presentation on the page (italics, bold or straight typographies can be found), on the whole they have a lot in common, stylistically speaking first. Indeed, they bluntly contrast with the rest of the narrative: their brevity, their grammatical simplicity and their formal concentration all deviate from Powers’ style which is often described as “convoluted” or “labyrinthine”. The first sentences clearly contribute to the creation of surprise, notably by favoring unexpected layouts, or by denying the readers any precise determination. They also generally present the readers with rare syntactic constructions, sometimes on the edge of grammaticality, which means that their borderline natural status as introductory sentences gets formally repeated in the way they explicitly display this kind of structural limits. Those easily recognizable characteristics tend to build up an authorial sign-like gesture. So what kind of gesture is this, and what is, assuming there is one, the single literary strategy behind
those different forms? Should those first sentences be considered as elements participating in the installation of metaphorical models (along with the epigraphs), or are they rather agents that destabilize those very models that were just introduced?

A closer look at the sentences reveals three categories and matching tendencies: three of them seem to attest to a disorienting purpose—through negation or indetermination—mostly centered on blurred spatial and temporal data:

“For a third of a century, I got by nicely without Detroit.” (TFWD 9)
“This room is never anything o’clock.” (PDT 3)
“In some empty hall, my brother is still singing.” (TOS 3)

As for Galatea 2.2 and Operation Wandering Soul, a blunt contradiction between two opposing stances is offered. It proposes a paradoxical pattern that thrusts the readers into the aesthetic tensions staged in the texts, which can be read as a frontal warning of some indefinite kind:

“Kraft cruises down the Golden State: would it were so.” (OWS 5)
“It was like so, but wasn’t.” (G2.2 3)

Those two binary sentences notably question the validity of any type of representation by epitomizing the ability of the language to both set up bearings and denounce them simultaneously.

In Prisoner’s Dilemma, The Gold Bug Variations, Gain and The Echo Maker, the readers get confronted with another kind of sentences that relies on the building up of a delusion followed by its delayed undermining (everything seems quite harmonious, but that first impression grows progressively weaker in the following pages):

“Somewhere, my father is teaching us the names of the constellations.” (P 13)
“What could be simpler?” (GBV 7)
“Day had a way of shaking Lacewood awake.” (G 3)
“Cranes keep landing as night falls.” (EM 3)

As a matter of fact, all novels, including those last four and although their first sentences do not point it up, start their narratives on an experience of intense crisis where recurrent tragic motifs are to be found, such as loss (Galatea 2.2), death (Prisoner’s Dilemma, The Gold Bug Variations, Gain, Plowing The Dark, The Time of Our Singing), evacuation (Three Farmers on Their Way to a Dance, Operation Wandering Soul, The Gold Bug Variations), accident (Operation Wandering Soul, The Echo Maker), or disappearance (The Time of Our Singing).

Similarly to what emerges from the epigraphs, the opening sentences essentially assert aesthetic and formal directions, but with a different purpose. As closed subsystems, these sentences seem to miniaturize the greater structural tendencies organizing the global form of the textual systems. Because of the suspensive effect originating in their unusual style and density, they invite the readers to pause and consider the relationship between the two poles of representation and interpretation. As French philosopher Gaston Bachelard wrote about the insertion of poetic images in literary texts, for example through the use of the miniature, “it is one of the appeals to our consciousness of verticality”. This kind of appeal introduces doubt about the validity of linearity at the very moment when the readers engage in the act of reading. A new type of reading gets
promoted, one relying both on linearity and verticality, a combination which recalls the renewed vision of scales advocated by systems thinkers.

By resorting to negations, to a blurring of bearings, to paradoxes and to a denunciation of delusory paths, the opening sentences seem to question both the status of the text of fiction and the introductory guidelines traced out by the epigraphs, thereby making any heuristic approach fundamentally suspect and potentially threatened, especially since the readers are entering a shattered and fragmented world.

Within the space delimited by the opening as a semiotic unity, that is including title, epigraph, subtitle sometimes, and the novel’s first lines, what emerges is that the first sentences exert a balancing structural power against the other elements. First sentences consistently object to any programmatic impulse and thus inform the readers about the shortcomings of the principles outlined in the epigraphs. Consequently, they can be seen to some extent as local agents of resistance and disorder against global metaphorical constraining tendencies.

However, it does not seem that the systematic questioning triggered by the first sentences actually cancels out the initial models entirely. This questioning rather helps the readers become aware that local expression and discrete linguistic evidence may well exceed the models’ boundaries, or at least be more ambivalent and unpredictable than implied by those very models. The first sentences may therefore arouse suspicion not about the models themselves, but rather in such a way that they get the readers to take the full measure of the innovative and destabilizing potentiality of language and writing in the making. These sentences reveal that the latter always offer more movement, unpredictability, and thus informational richness than the mere delivering of modeled qualities.

From those two modelizing confronting stages (epigraph/first sentence) which are superimposed in the openings to give shape to a complex textual threshold, an involved double-barreled programming action develops. It seemingly aims to prepare the readers for a certain type of formal excess based on multiple patterns and on the overt density of metaphorical networks which are perceptible as soon as they have crossed the line.

When trying to extract some organizing principle from the opening sections, the readers immediately stumble upon the intricacy of a global system whose value and meaning transcend the sum of its constituting elements. This specificity once more fits the description of complex systems (the fact that a system’s complexity forbids any reductionist or analytic approach as a way of accounting for the global evolution of the system). Complexity does not only induce a quantitative change, but above all a change in nature, which means that interactions become more significant than discrete elements whose configuration cannot be linear anymore.

Ultimately, the novels’ opening sections testify to the overwhelming predominance of interactions, notably through the use of recurring network imagery (for instance train or car traffic in Three Farmers on Their Way to a Dance and Operation Wandering Soul, or animal migration in The Echo Maker, constellations in Prisoner’s Dilemma, electronics in The Gold Bug Variations, or the internet in Galatea 2.2). Those are greatly self-referential or metafictional systems that stoke up circulation within the analogic textual system, between multiple embedded levels of signification.

Consequently, the openings can be said to achieve a decisive introduction to the concept of complexity, not from a theoretical point of view, but rather insofar as they get the
readers to physically and intimately experience it—as Eddie Sr. does in *Prisoner's Dilemma* when he mentions his “brush with history,” an event from which all things develop, including the act of reading and the creation of the novel itself. In the openings, the readers are similarly made to experience what could be called an inaugural and challenging “brush with complexity.”

Now, for all those considerations, my intention is not to dismiss the openings’ programmatic qualities altogether, but rather to show how mapping and interpreting the structural lines they draw is made harder because of the profusion of motifs, their diversity and the insertion of coding barriers (barriers which are repeated for example in the “complexity barrier” that locks Ressler out of the comprehension of the genetic system in *The Gold Bug Variations*, an experience similar to the readers getting blocked by the initial coded message). Incidentally, the notion of “complexity barrier” also comes from complex systems science. The transitional space the readers have to inhabit, get lost in and decode if they want to get past the front pages and misleading tracks offered, constitutes a trial field for complexity and the access road to new paradigmatic rules.

The opening sections are hybrid areas, strained between opposing modelizing moves. The wide structural range of the inserted models both confirms the texts’ complexity and defers their programmatic efficiency, causing what Tom LeClair calls “overload”:

> Overload results when the rate of information—and information is defined as a function of improbability—becomes too high for the receiver to process, to sort and integrate within his operative categories. (LeClair 14)

This happens for instance at the beginning of *Operation Wandering Soul* where every linguistic dimension (semantic, lexical, syntactic or symbolic) as well as a multiplicity of codes are used to generate this kind of informational excess so that the readers get as saturated as the depicted scene, that is some ultimate traffic jam in the LA suburbs. In this scene, the main protagonist Richard Kraft finds himself fighting that disorderly process—as are the readers, trying to sort out the confused data—in two different ways. First he tries to restore some kind of spatial consistency to the system by applying a scientific and reasoned approach (he tests the system, makes experiments, suggests logical relationships and reasons for the surrounding disorder). These are consistent with his fictional “fixing” activities as a surgeon repairing bodies (Kraft even gets compared with a plumber in the text). But at the same time, he gives way to impulsive responses that threaten the system’s fragile balance. Accordingly, the readers may alternatively favor different kinds of reading in a novel that is torn between unmanageable reality and escaping imaginary worlds which seem promising but might be just as deceiving.

On the whole, the novels’ introductions help stage tensions between different worlds of signs which are to be explored by both characters and readers. More than mere presentation areas introducing the structural and thematic issues at stake, the opening parts display those issues in and through their spatial organization and the imaginary space they map out. That is why the opening places in *Three Farmers on Their Way to a Dance* and *The Gold Bug Variations* emphasize mismatches in scales and a lack of harmony. In *Operation Wandering Soul*, the symbolical network is similarly blocked by some perpetual gridlock, while the narrators in *Galatea 2.2*, *Prisoner’s Dilemma* and *Plowing the Dark* happen to be unable to find their place in virtual spaces. Each time, the kind of turbulence or noise that is generated through spatial configurations heralds formal conflicts that organize the global system of the text at each of its epistemic levels. Studying the openings thus reveals that it is extremely difficult to try and assign them a...
precise and one-way programmatic function, even though programming is part of their construction and accounts for certain global evolutionary tendencies. Whether it is the destabilization of bearings, more or less visible obstacles to deciphering processes, the diversity of models or the voluntary obfuscating of signs, numerous strategies effectively counterbalance the prevalence of structuring models in the novels' openings and ultimately make the readers aware of the world of complexity they are entering.

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ABSTRACTS

Richard Powers’ novels are commonly associated with “systems novels” as Tom LeClair first described them, notably because of the constant compositional use the novelist makes of different extra-textual systems (including various fields such as biology, computer science, or more extensively chaos theory).
To what extent do those modelized systems, apparently meant to supply structuring tools to readers keen for interpretive keys, contribute to the novels’ inner complexity, and how does their installation in the texts take place? The way I have chosen to address this issue is to look into the openings of the novels as privileged locations where formal guidelines are provided. Focusing on the openings helps point out functional variations in the use of models, which appear to be essential to the continuous development of complexity throughout the texts. The openings therefore seem not only to have programmatic virtues, but also to offer disorienting elements whose impact on the global scale (that is that of the novel as a whole) forces us to reconsider the scope of the models at stake in Richard Powers’ writing.

Les romans de Richard Powers sont souvent associés aux « romans systémiques » tels que Tom LeClair a pu les décrire, et ce notamment en raison de l’usage répété que le romancier fait, dans la composition de ses textes, de divers systèmes extra-textuels (dont la biologie, l’informatique et, plus largement, la théorie du chaos). Dans quelle mesure ces systèmes modélisés, apparemment destinés à donner aux lecteurs avides de clés interprétatives des outils propres à dégager des structures, participent-ils de la complexité interne des romans, et comment ces systèmes sont-ils mis en place dans les textes ? Le présent article aborde ces questions en analysant l’ouverture de plusieurs romans, lieu privilégié de l’instauration de lignes de force structurelles. L’étude de ces ouvertures permet de mettre en évidence des variations fonctionnelles dans l’utilisation des modèles, variations qui pourraient s’avérer essentielles au développement de la complexité dans les romans. Les ouvertures ne semblent ainsi pas seulement posséder des vertus programmatiques, mais proposent aussi des éléments désorientants dont l’influence à l’échelle globale du texte (celle du roman considéré comme tout) oblige à revoir la portée des modèles qui sont en jeu dans l’écriture de Richard Powers.

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