Displacement Vector Analysis on the GO Board in ∈ by Jacques Roubaud

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Jacques Roubaud's hybrid vocation associated with creativity, science, and play is presented in ∈, a collection published in 1967.[1] We will be focusing on the scientific creativity at play, a fruitful encounter between the form of prose poetry and the displacement vector analysis (DVA) of movements on the GO board. We argue that Roubaud's creativity is a good example of poetic and cultural inventiveness with specific reference to literature, science, and games.

Roubaud, who is an Oulipian by anticipation[2], a 'troubadour'[3], a 'pre-modernist' writer, an admirer of Dante Alighieri, offers several intertwined frameworks – scientific and literary[4] – to understand his sonnets in ∈:

> donnez moi des couleurs plus pures dans cette langue
> comme des ondes qui désagrègent même le roc donnez moi du neuf de la vitesse dans cette langue
> donnez moi des toiles mouvantes
> donnez moi des graphies jamais employées (∈ p. 21)

In an interview with Jean-François Puff, Roubaud describes how poetry needs to blend with other disciplines, such as performance or computing, to survive. Furthermore, poetry and science can advance better by observing the past[5]: «Les choses nouvelles que l'on va faire ont leur germe loin en arrière. C'est un phénomène qui dépasse la question de la poésie: on le trouve en mathématiques, dans la science»[6].

Combining innovativeness with entertainment, Roubaud uses the ancient Chinese game of GO to develop interactive poetry. His approach is one of poetry as action in which he helps readers explore the language, reinforce scientific and gaming concepts, and develop analytical and deduction skills, while experimenting with the meaning. According to Lusson, Perec, and Roubaud in *Petit traité invitant à la découverte de l'art subtil du GO*[7], the game of GO, introduced in Japan by the Ambassador Kibi no Asomi Makibi, has its own secrets and mysteries, as well as captivating legends and charms (p. 22). The game of GO, also called a «Duel» (p. 22), «le Jeu des Jeux» (p. 38), can compete with the art of literature and science in terms of strategy and movement: «Pourtant le GO est un jeu de mouvement» (p. 25).

Roubaud's arrangement of sonnets reflects the movements in a GO game. They are agile in form and content, formidable to see and interpret and engage readers' many senses. Writing poetry is a practical exercise for Roubaud, inasmuch as to criticize their beauty, structure, and function: «Je regarde comment ces vers fonctionnent, et en composant ces poèmes je les critique, du point de vue de la composition du vers, du poème, de la typographie…»[8].

Roubaud is a silent player: he juggles with vocabulary by shifting blocks of words around, he frames structures by creating diagrams and clusters, and he repeats many moves for effect: «De cette certitude, qui unit en un même instant la liberté et la contrainte, l'intuition et l'expérience, naît la panique qui est le bien-être suprême du Joueur de GO […]»[9]. In «L'Énigme

de la signification silencieuse»[10], Peter Consenstein analyzes Roubaud's silence and associates it with the rhythm[11]. Despite his silence, disconnection from reality, or widespread panic, the poet-player builds consciously his entire interconnected structure to advance ∈. The ludic nature of GO becomes Roubaud's structural integrity, the glue holding its parts together: «Alors il m'apparut brusquement que je devais construire mon livre sur le modèle de cette partie»[12]. He writes with the awareness of movement that resembles the scope of GO: «Il n'existe qu'une seule activité à laquelle se puisse raisonnablement comparer le GO. On aura compris que c'est l'écriture»[13].

Many literary critics emphasize the close readings of Roubaud's texts: the focus on form and constraint, space and travel, mathematics and logic, punctuation, generic ambiguity, autofiction and auto-portrait, memory, «japonisme», and comparative inquiry. However, not many scholars engage in dialogue with the complexity of displacement in ∈. Certainly, the DVA is a new point of view to Roubaud's work. In *Jacques Roubaud: L'amour du nombre*[14], Véronique Montémont's reflections on mathematical and logic symbols are intertwined with her analysis on space and permutations. She identifies several «spatialisation» techniques and metaphors in Roubaud's texts. For example, the reflection on *Signe d'appartenance* is followed directly by engaging comments on punctuation, images, calligrams, diagrams, graphs, and tables: «Le poème se *parcourt*, au propre comme au figuré. La dimension calligrammatique est là pour briser la linéarité, ouvrir des chemins textuels qui sont surtout des portes de lecture»[15]. Furthermore, Elvira Monika Laskowski-Caujolle identifies a mathematical style in Roubaud's prose: «Inspired by his reading experience of mathematical texts and by writing mathematical research papers, Roubaud creates the entire series in a style of prose that I call *mathematical style* or *mathematical prose*»[16]. Véronique Montémont refers to numbers as one of Roubaud's secrets: *«Il est lié chez Roubaud, de manière organique, au mystère, dans la mesure où la branche des mathématiques traitant des nombres, l'arithmétique, est pour l'auteur «sentie comme une espèce mystérieuse de poésie»*[17].

In addition, Jacqueline Guéron acknowledges the difficulty of logic and mathematical signs (including Bourbaki signs like ∈). In set theory, ∈ means element of, or an assembly. When Roubaud declares that he belongs to something, he means that he and his graphical ensemble belong to the world.[18] Christophe Pradeau characterizes the imbricated genre of Roubaud's texts in various ways: «Si l'œuvre se laisse définir, c'est par son allure, une certaine façon buissonnante de cheminer, de s'étoiler en pattes-d'oie, croisées des chemins»[19]. Alison James[20] offers an analysis of Roubaud's play on genre, truthfulness, and artifice. Christophe Reig deciphers Roubaud's intertextual secrets arguing that enigmas are traps that hide the inserted quotes: «Cette mobilité textuelle tend des pièges à la lecture, dont la progression ralentit, du fait des tentatives de repérage des instances énonciatives supplémentaires que sont ces citations insérées, avouées ou dissimulées»[21].

Many scholars examine the French intertextual influence on Roubaud, while Véronique Montémont and Lucy O'Meara[22] read Roubaud under a Japanese aesthetics, which goes deeper than a selective borrowing of quotes and symbols. This fascination can easily be seen in the construction of Roubaud's corpus. He uses components that are abstract in nature and shape, such as an empty-centered labyrinth, an unending loop, an eye and a circle. Nevertheless, comparative studies[23] on Roubaud and other writers may help to explain his influence, sources of inspiration, and scientific writing approach. Let's play our own game with Roubaud's stone-sonnets, because the very premise of Roubaud's text is to actively engage the audience. This essay follows the displacement vectors through chapters 2 and 4, where the grid diagrams are present, and discusses the profound process of movement, displacement, or translation[24] in Roubaud's ∈ through the prism of DVA, a novel approach to Roubaud's work.

In physics, a displacement vector (DV) is associated with an object in motion. It represents the shortest distance between the initial and the final positions of the object and has a direction pointing from the initial position towards the final position. Consequently, vectors are described by magnitude and direction and are represented by an arrow with its tail at the initial position (before the motion starts) and its tip at the final position (where the motion ends). The motion of an object develops in a three-dimensional (3D) physical space and a displacement is described by both the length and the direction of travel. DVs do not depend on the traveled path, time or speed of travel. Traveling from the initial to the final position in a straight line or with as many detours as one chooses would result in the same DV.

What could be the possible relationship between

physics' DV and Roubaud's artistic montage? This connection is straightforward when one realizes that the 'physical space' in Roubaud's ∈ is replaced by the 2D GO board – *the GO-space*. Roubaud, always graphical and unique in style, takes a spirited and innovative approach to writing sonnets. Thus, he goes against centuries of dogma driving this literary genre: «[…] according to Roubaud the essence of the Oulipian project is not the constraint but potentiality, which may be realized by forms as well as by constraints»[25]. At the same time, Roubaud instructs us on how to read his poems, thus challenging the reader to travel on a certain path through the book. If there is a path, there is a DV. Jean-Jacques Thomas and Steven Winspur comment that poetry imitates spatial movement: «The spatial architecture mounted on a page, which gives the text's verbality the appearance of an object, has taken on an ever-increasing importance in contemporary French poetry»[26].

Roubaud claims that ∈ is a collection of 361 visual[27] sonnets intrinsically interconnected with the game of GO played between Masami Shinohara and Mitsuo Takei (∈ p. 8, p. 144). Roubaud chooses the pattern of GO-stones set at move 157 out of the 200 moves in their game (∈ p.144). When analyzing ∈, the reader takes a journey not only through the book, but also through the game of GO. Therefore, one must learn the mechanics of GO. The GO-space, as a 2D space, is marked with horizontal and vertical axes of coordinates. Like a Cartesian system of coordinates, the lower left corner is the origin of such system. The horizontal axis has 19 positions marked with alphabet letters from A to T (I is excluded) and the vertical axis has 19 positions marked with integer numbers from 1 to 19. When the game starts, the black stones always play first. As a result, all white stones on the board relate to odd-move numbers and all black stones relate to even-move numbers.

Any stone on the board is perceived as a handicap for the next player as it reduces choices for available positions on the board. When there is a difference in experience between players, the black-stone player can start with several preset stones on the board to offset the strength difference between players of different ranks. These are referred to as handicap stones because they bring an extra challenge for the white-stone player by allowing the first player to plan ahead of the first move. The seven unnumbered black stones on the board are this game's handicap stones (∈ p. 144). Roubaud acknowledges: «Ce jeu est un jeu de handicap, Mitsuo Takei (noirs) ayant 7 pions noirs d'avance placés traditionnellement aux emplacements réservés à cet effet» (∈ p. 143).

To connect to GO, Roubaud divides the sonnets into groups based on stone color. The first group has 180 sonnets as white stones and the second group has 181 sonnets as black stones (∈ p. 7). To guide the reader through such a detailed organization of the book, Roubaud offers four dissimilar reading strategies (∈ §0). The first method, the *Diagram Order*, suggests reading groups of poems based on the title diagrams and forgoing certain groups of poems. Each group is independent of the others, is self-contained, and is present in chapters 2 and 4 only. The second method, the *Pagination Order*, suggests reading the poems in the order presented in the book, following their succession on the page. Thus, poems are now grouped in five different chapters. The third method, the *GO Order*, suggests reading the 157 poems following the progression of moves in GO (∈ p. 144). The fourth method, the *Random Order*, suggests reading the poems randomly, in an unrelated order (∈ p. 9). Jean-Jacques Thomas and Steven Winspur call this method the «stochastic drift»: «As such this reading poses many problems since it reintroduces chance by allowing indetermination to enter the general economy of the numerical network»[28]. Because ∈ has many formal properties, Jean-Jacques Poucel approaches the work from multiple directions:

> Given the variety of its organizing structures, ∈ has not one center but, rather, multiple, interrelated centers. The play between the individual elements of the text and its conception as a whole, or as multiple wholes, initiates conditions of play between the exact and the general, between the linguistically precise and vague, between presence and absence, between totality (*le tout*) and nothingness, notions that are important in modern poetics generally, and in Roubaud's *Projet* more specifically[29].

Indeed, Katherine McDonald, who translated in English several of Roubaud's sonnets from ∈, says that Roubaud's poetry moves in two directions at once. She identifies some formal constraints, such as the movement of white and black markers, the sonnet of sonnets, and the possibility of re-ordering poems. She finds that:

> Although each poem can stand alone, the sonnet can also be read as a suite. The reader can follow the movement of thought that unfolds as the poet moves from rejection of the outside world through an interrogation of language, concluding with an acceptance of that world through the medium of his own past[30].

In this section, we apply Roubaud's reading strategies combined with critical thinking abilities and the eyes of a scientist, in order to reveal visual patterns that show a greater cognitive flexibility of Roubaud's book. The DVA will focus on the *Diagram Order* as it prompts the reader to take a well-defined path through the book. In the *Diagram Order*, grid diagrams leading each subunit in chapters 2 and 4 represent the 'physical space' supporting the DVA and each subunit takes the reader on a journey on the GO board. The analysis investigates the relationship between the sequence of the sonnets as they unravel through the grid diagrams and the associated sequence of unpredictable GO-moves.

Chapters 2 and 4 are formed of subunits and each subunit consists of a certain number of sonnets. Chapter 2 has three subunits: the first one labeled 2.1 and the second and the third without numerical labels (referred to as 2.2-null and 2.4-null hereafter). There is no 2.3 subunit.

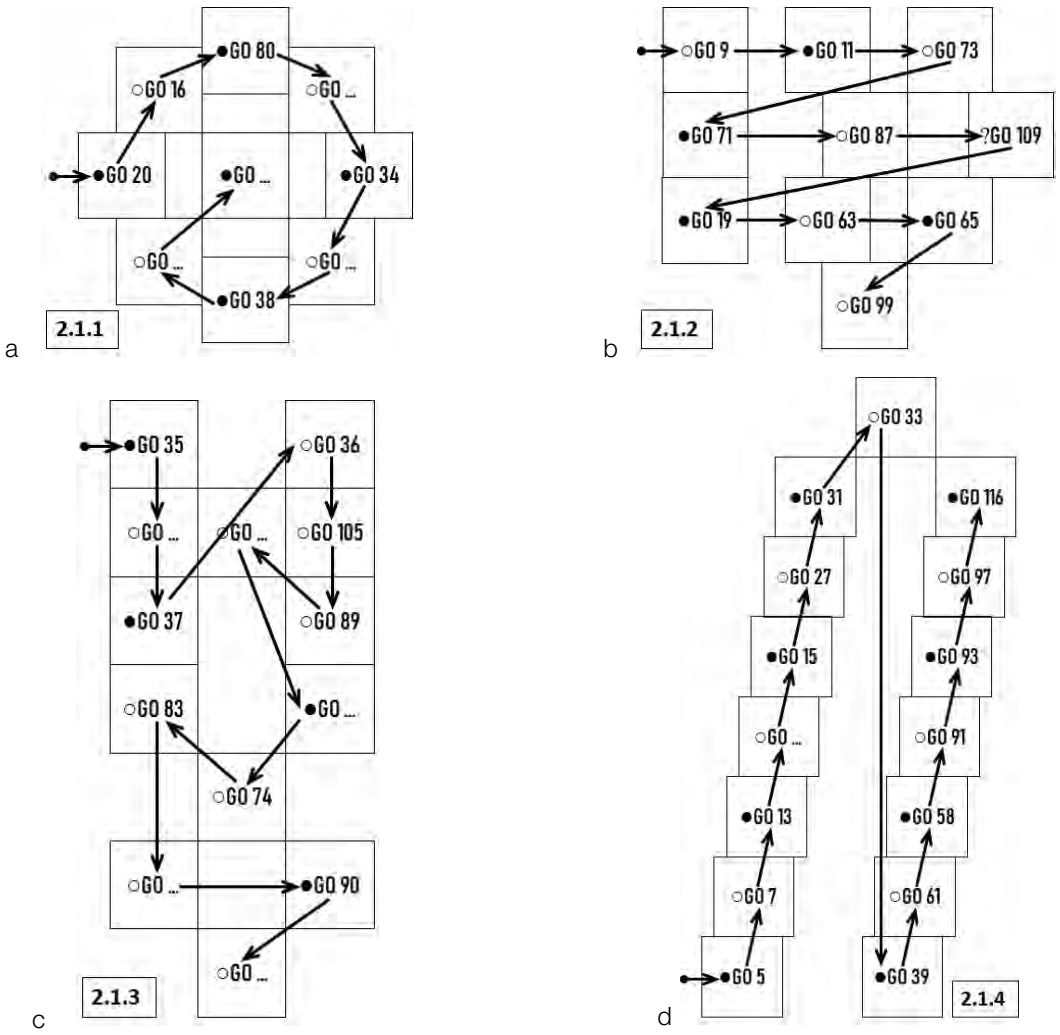


Figure 1. Displacement vectors (DVs) show reader's trajectory for diagrams in subunit 2.1: (**a)** structure 2.1.1; (**b**) structure 2.1.2; **(c**) structure 2.1.3; and (**d**) structure 2.1.4.

Subunit 2.1 is made of four grid diagrams. Figure 1 shows DVs of each grid diagram and Figure 2 shows the DVs on the GO board for the same structures. It is noteworthy that in the figures below, sonnets with-

out GO-move association are marked as «[GO…]» and sonnets without GO-stone association are marked as «? [GO #]» (e.g. «? [GO 109]» in Figure 1b). The starting sonnet in each grid diagram or on the GO board is marked by an oval-tail arrow and all diagrams start on the left side of the diagram.

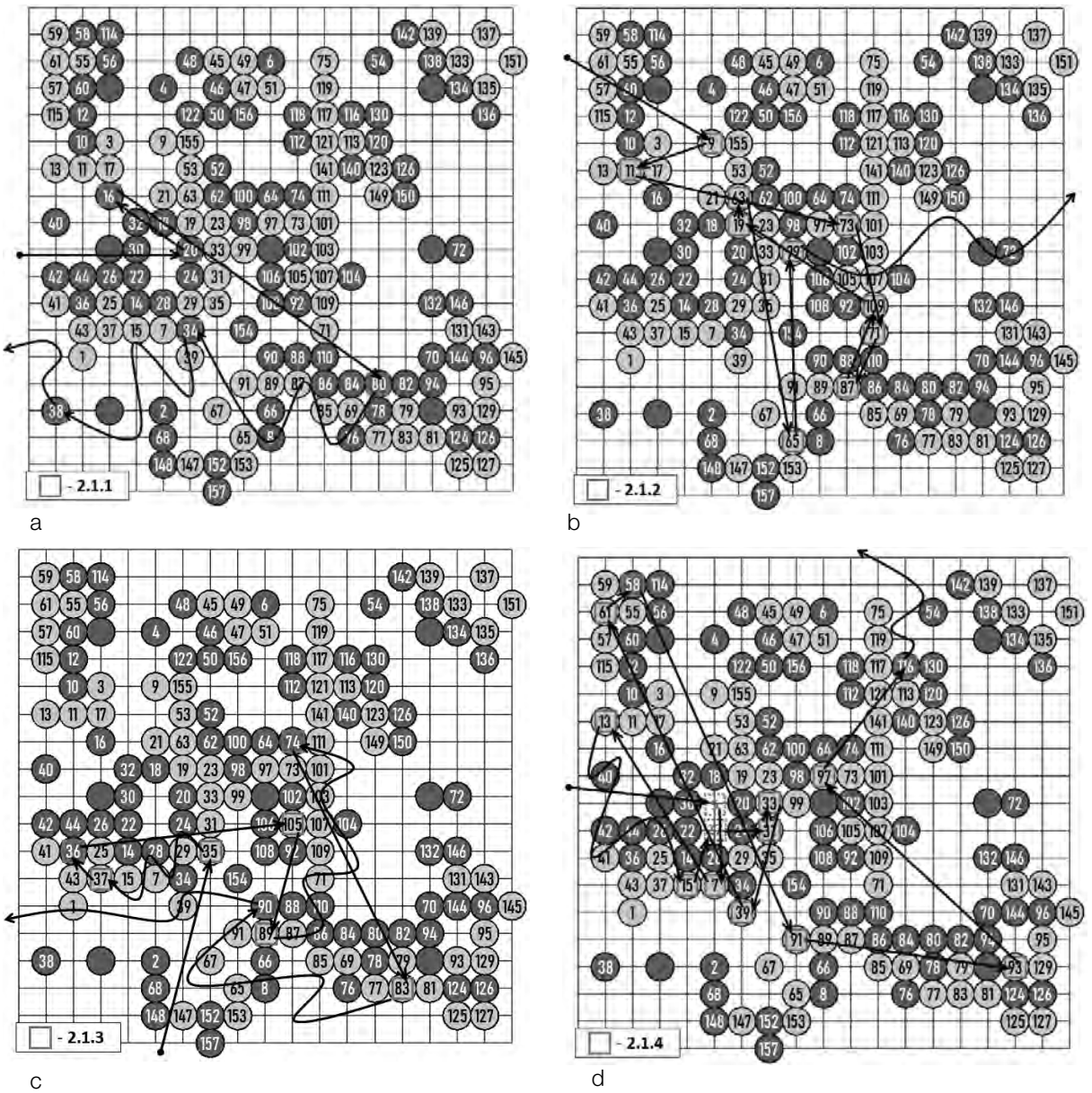


Figure 2. DVs show reader's trajectory on the GO board for diagrams in subunit 2.1: (**a**) structure 2.1.1; (**b**) structure 2.1.2; (**c**) structure 2.1.3; and (**d**) structure 2.1.4.

Structure 2.1.1 «horloge des textes» is made of 9 sonnets organized as an 'eight-hour' clock dial with only one hour-hand pointing inwards from the sonnet located at «5 o'clock» mark. This sonnet is associated with a white stone, but no GO-move number (Figure 1a). The reading of this grid diagram starts with the sonnet associated with the 20th GO-move of the black-stone player. As such, the diagram starts at «6 o'clock» on this dial, whereas the clock hand seems to point to the sonnet «je suis revenue de la poussière orange des déserts». DVs show the circular motion on

a dial, confirming Roubaud's title selection. The central grid location, as well as, «1 o'clock» and «3 o'clock» locations have no GO-move associations, therefore the DV across the GO board is uncertain (Figure 2). While the 2.1.1 grid diagram is well defined, the movement across the GO board does not reveal the same clock dial pattern.

Structure 2.1.2 «Refuges» is made of 10 sonnets organized as a series of incremental advancements in the battlefield of love [GO87], «Amour plus Fort que la Mort», (∈ p. 48) followed by abrupt and major retreats or refuges. The overall oscillation across the field ends with a settled position at sonnet [GO99] halfway between the initial [GO9] and most advanced, [GO109] positions (Figure 1b). The same vector pattern of advancement followed by retreat is visible in Figure 2b where a set of GO moves takes us downwards from [GO9] to [GO87], then up to [GO63], down to [GO65] to finally settle about the center of the GO board at [GO99].

Structure 2.1.3 «Forêt» is made of 13 sonnets organized as a wondrous nature trail in the woods. This journey starts at [GO35] and ends at an undetermined [GO…] location. Our DVA shows many possible directions of motion (Figure 1c). On the GO board, the same undefined pattern is revealed (Figure 2c).

Structure 2.1.4 «Cité» is made of 15 sonnets organized as an incremental, directional travel through a busy metropolitan area with traffic in one direction, e.g. northbound from [GO5] to [GO33] and [GO39] to [GO116]. Positions [GO33] («clef de Fontfroide», ∈ p. 60) resemble a key connection hub between two major bus lines or a bridge across different parts of the city (Figure 1d). The idea of extensive movement is inferred from long DVs on the GO board, e.g. from [GO39] to [GO61], from [GO58] to [GO91], from [GO91] to [GO93], from [GO93] to [GO97], or from [GO97] to [GO116] (Figure 2d).

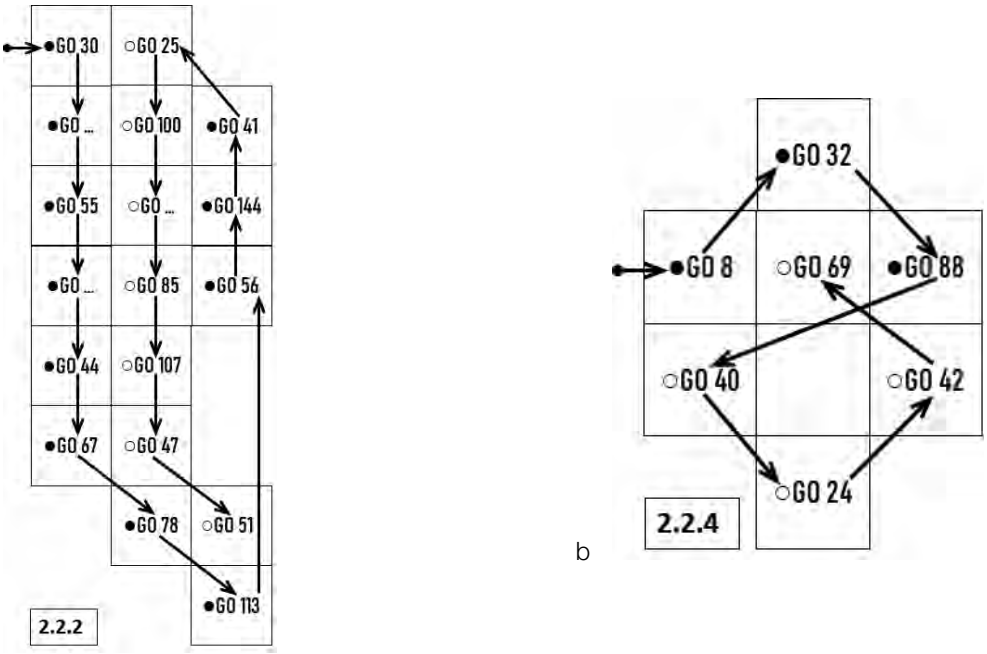
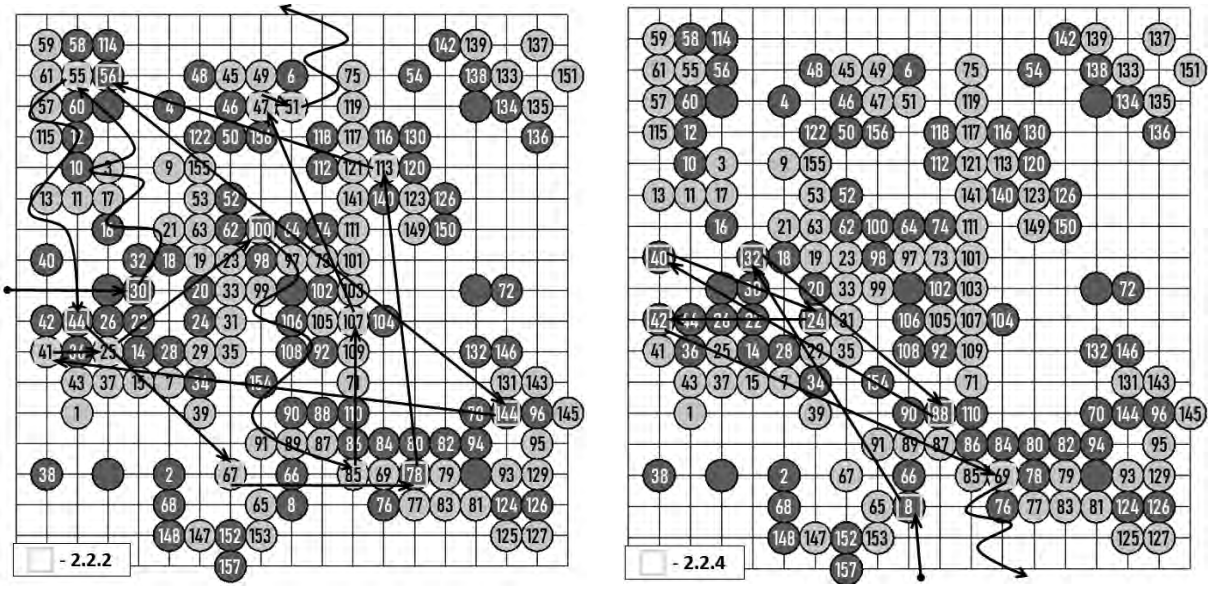


Figure 3. DVs show reader's trajectory for diagrams in subunit 2.2-null: (**a**) structure 2.2.2 and (**b**) structure 2.2.4.

The second unlabeled subunit, 2.2-null, is made of two structures – 2.2.2 and 2.2.4 (Figure 3). Structure 2.2.2 «Élégies et jardins» consists of 18 sonnets. The DVA (Figure 3a) resembles a vertical longitudinal spiral that in Roubaud's multidimensional optics is resonating with either «l'œil du monde» (∈ p. 68), a complex formation of whirlwinds: «les vents obligatoires et jadis dans un vent frais dans un vent vernal» (∈ p. 70), or the spiral of galaxies: «les constellations étaient son délire» (∈ p. 73). However, the DV pattern on the GO board is resonating with a combination of whirlwinds as the reader travels in a complete counter clockwise loop, such as from [GO55] to [GO44], [GO67], [GO78],

[GO113] and back to [GO56] adjacent to [GO55], followed by another clockwise loop in the middle of the board (Figure 4a).

Structure 2.2.4 «Nuit devant la nuit» consists of 7 sonnets and is the diagram of KO. By using the move of KO, a player captures his opponent's game piece and transforms the captured piece into one of his own. It is a situation where two players, alternating single stone captures, would repeat indefinitely, preventing the game from ending. After [GO69], the black-stone player could move into the empty position, the eye of the KO, thus capturing the white stone at [GO69]. Diagram DVs resemble the vertical ∞ symbol (Figure 3b) whereas the movement on the GO board is also repetitive, back and forth, like roller coaster loops.



a b

Figure 4. DVs show reader's trajectory on the GO board for diagrams in subunit 2.2-null: (**a**) structure 2.2.2 and (**b**) structure 2.2.4.

Roubaud explains: «Ko, qui signifie «éternité» ou «infini» est, dans le jeu, une porte par où s'engouffreraient tous les pions» (∈ p. 73). The actual KO scenario in the game of GO is presented in Figure 2d where two stones at [GO5] and [GO27] were captured under this setting.

The third unlabeled subunit, 2.4-null, is also made of two structures – 2.4.2 and 2.4.3 (Figure 5). Structure 2.4.2 «couleurs» consists of 7 sonnets interceded by squares of different colors. A DVA of the diagram (Figure 5a) presents a horizontal one-dimensional setting of sonnets and squares. The break after the yellow square is most likely a need to fit the page. Sonnets are very color oriented, and the inserted square, while a very novel and unconventional approach to writing, destabilizes any possible vector analysis on the GO board (Figure 6a). However, the colored squares «travel» abundantly through this structure and in sonnets adjacent to colored squares (Figure 5a). For example, [GO22] uses «noir» five times, [GO101] uses «jaune» five times, [GO29] uses «blanc» eight times, all in abundant combinations with many other colors such as bleu, indigo, azure, green, red, brown, grey, violet, or gold.

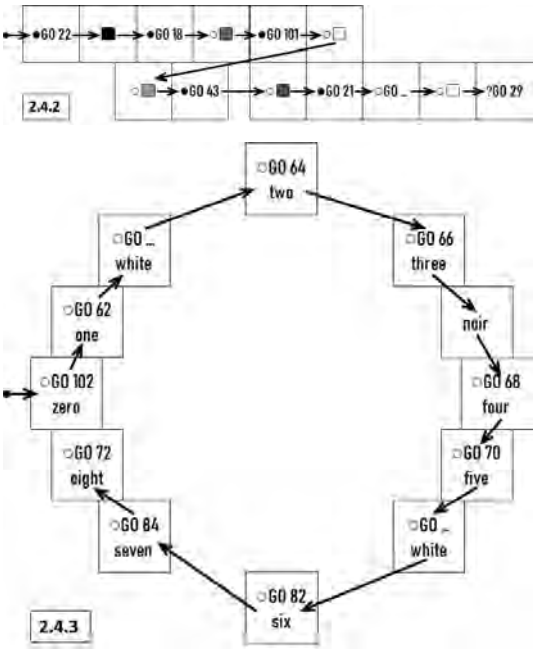
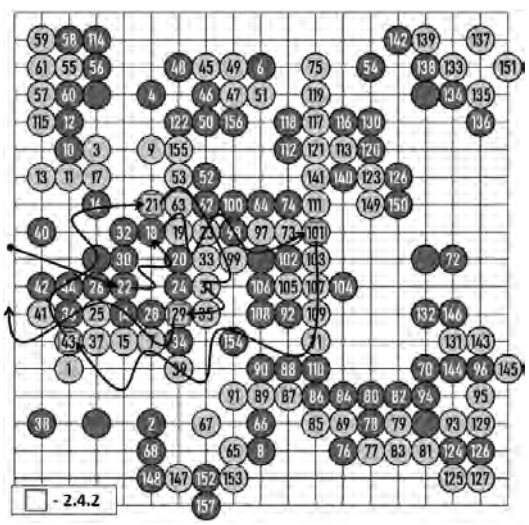


Figure 5. DVs show reader's trajectory for diagrams in subunit 2.4-null: **(a**) structure 2.4.2 and (**b**) structure 2.4.3.

Structure 2.4.3 «vue» consists of 8 sonnets and 4 colors. The grid diagram is titled «dodécagone». Our DVA (Figure 5b) confirms the title presenting a 12-sided polygon. The colors are represented by white GO-stones, but without any association with the GO board, they seem more like place holders in the polygon structure. The vectorial path on the GO board vaguely resembles a calligraphic «2» (Figure 6b). The motif seems to follow through: there is the sonnet «deux» [GO64], then «deux hémisphères» [GO66], «deux moitiés» [GO68], coupled entities: «les cuisses […] les seins» [GO82], «l'homme et la femme» [GO84], «les yeux» [GO72], and of course, all sonnets are associated to an even GO-move number, therefore divisible by 2.

Chapter 4 consists of three subunits – 4.1, 4.2, and 4.3-null. Subunit 4.1 has three grid diagrams, subunit 4.2 has one and subunit 4.3-null has none. Figure 7 shows DVs of these four diagrams and Figure 8 shows the DVAs on the GO board for the same structures.



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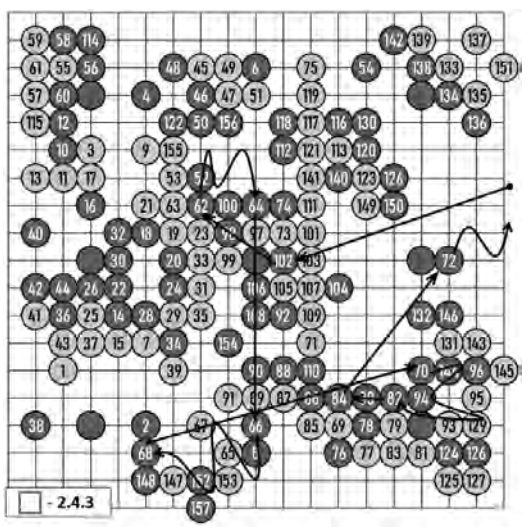

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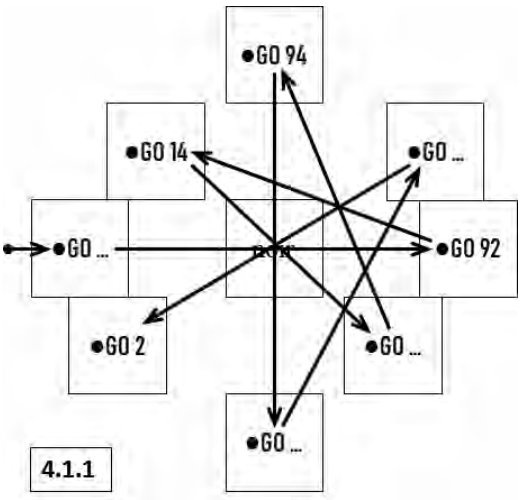
Figure 6. DVs show reader's trajectory on the GO board for diagrams in subunit 2.4-null: (**a**) structure 2.4.2 and (**b**) structure 2.4.3.

Structure 4.1.1 «⁎» is made of 8 sonnets organized as an asterisk or a star with a black color in the center (Figure 7a). However, DVA reveals an asymmetric geometry that seems to single out sonnet [GO2] representing Roubaud's 'reversed' lamentation for his younger brother who passed away at a young age: «Je suis mort […] je dis adieu et toi mon frère, sans savoir! mais tu n'oublies» (∈ p. 105).

The "black" in the center is the color of mourning and most of the DVs seem to cross it or swing nearby, as death is a central motif in 4.1.1. On the GO board nothing seems to be connected except [GO92] and [GO14] (Figure 8a). When analyzed, vectors aiming at [GO94] and [GO14] seem to avoid «black» and present a flicker of positivity: «(une marque? l'espoir?)» [GO92], «tu es sauf dans la mort» [GO14] or «[…] loyale est la survie» [GO94].

Structure 4.1.2 «gel noir» consists of 8 sonnets. Our DVA reveals the Greek letter tau, «τ» or the logic sign, to determine the quantifiers with it, the same as the title of the chapter (Figure 7b). On the GO board, the DV pattern resembles an up-side-down symbol «&».



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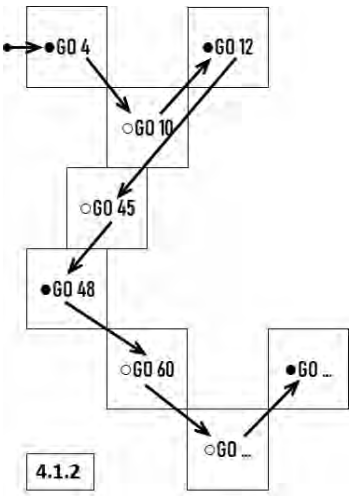

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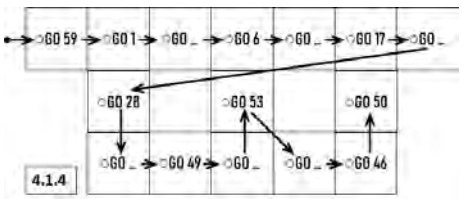

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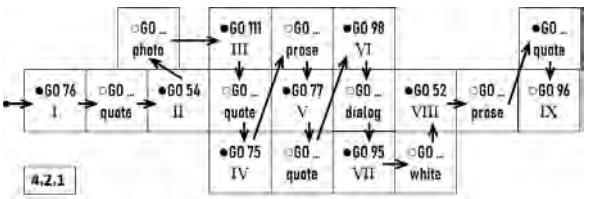

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Figure 7. DVs show reader's trajectory for diagrams in chapter 4: (**a**) structure 4.1.1; **(b**) structure 4.1.2; and **(c**) structure 4.1.4 under subunit 4.1, and (**d**) structure 4.2.1 under subunit 4.2.

Structure 4.1.4 «expériences» is explicitly stated by Roubaud: «Ces pions, blancs, forment deux "yeux" ou "me"». Figure 7c shows how the DVs contour two linked eyes. In GO, this setting prevents an opponent from breaking up a grouping of player's stones. The structure consists of 10 sonnets, citations, illustrations, and colors to fill in 15 positions in the two-eye diagram. The GO board pattern is undefined due to many indirect connections between the GO-stones (Figure 8c).

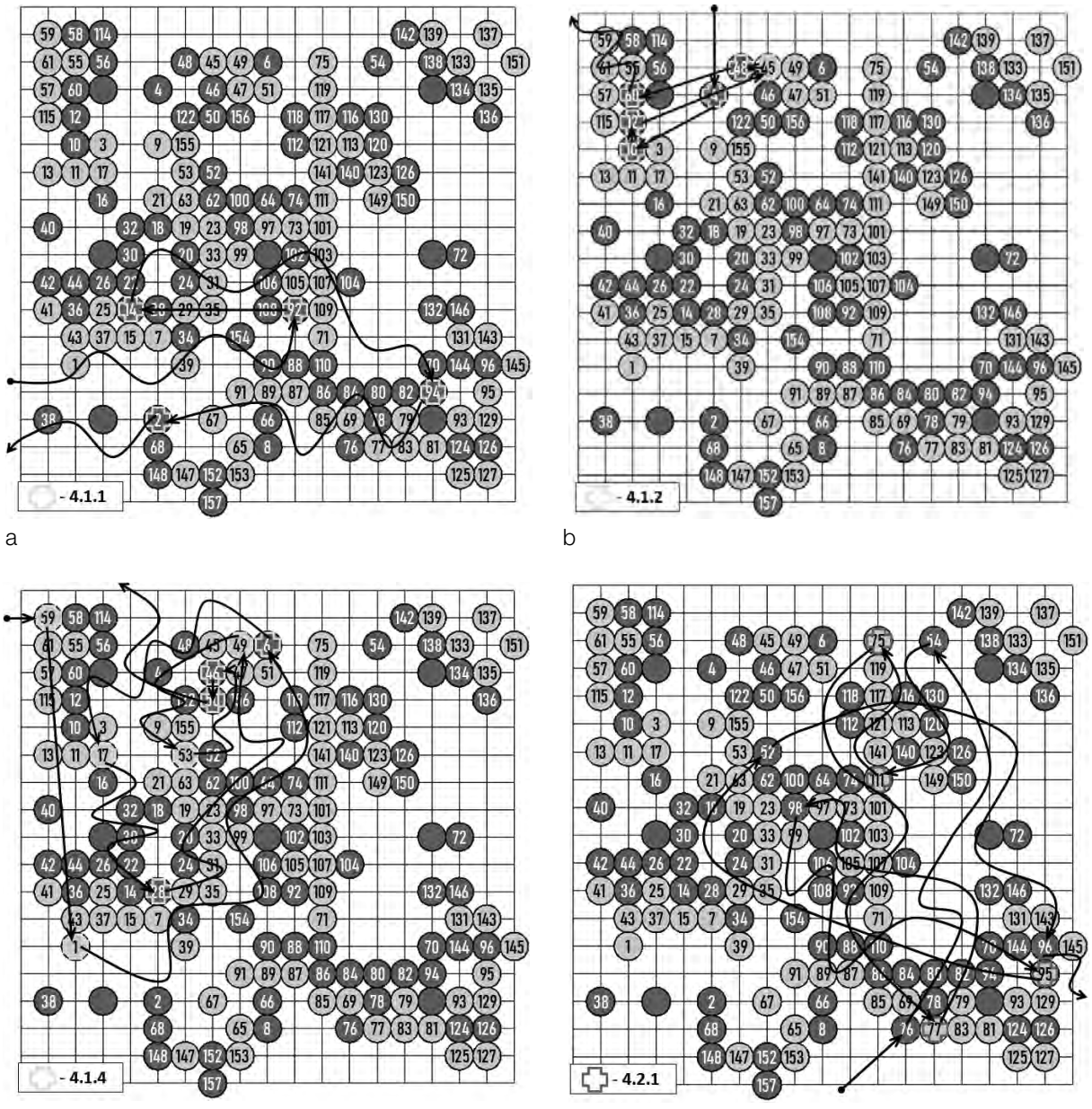

Figure 8. DVs show reader's trajectory on the GO board for diagrams in chapter 4: (**a**) structure 4.1.1; (**b**) structure 4.1.2; and (**c**) structure 4.1.4 under subunit 4.1, and (**d**) structure 4.2.1 under subunit 4.2.

The last structure, 4.2.1 «Santa Catalina island sonnets», is the most complex grid diagram in the book and was chosen to resemble the shape of the real island. Véronique Montémont points out that Santa Catalina Island sonnets do not seek to imitate the physical image of the island, but rather an imaginary one.[31] Figure 7d shows DVs traveling from left towards right. Sonnets [GO76] and [GO96] establish a horizontal axis corresponding to an axis oriented from south-east towards north-west (SE-NW axis) on the map. The main city, Avalon, is correspondingly located after [GO76], a white-stone sonnet represented by a quote from Encyclopedia Britannica describing the island. Another major resemblance is the orientation of the DVs and the road system of the island. Travel along the island is only possible on its sides, similar to sonnets [GO111]

towards [GO98] or [GO75] towards [GO95]. There is no direct route through the middle of the island, because of the major mountain range. However, most of the connections between these two arteries are perpendicular to the SE-NW axis, similar to the zig-zag distribution of DVs from [GO111] to [GO95]. On the GO board, the travel is convoluted and the interference of the sonnets without GO-move association prevents us from finding a well-defined trajectory.

Conclusion

A displacement vector analysis of Jacques Roubaud's ∈ reveals a truly unique style of sonnet writing. It unveils a complex integration of sonnets with a journey in the GO space using prescribed grid diagrams, which results in a literary platform that allows the reader to experience movement from a completely new perspective as the story is told. The travel across the GO board landscape is a multifaceted metaphor with different meanings in each structure. Some are indicative of critical moments in Roudaud's life: the clock dial pointing to his French military service in 2.1.1 and the love's ups and downs, but a necessary retreat in life in 2.1.2. Some focus on experiencing the surroundings as Roubaud recreates nature in 2.1.3 and traffic in the metropolitan area with unidirectional lanes and bus hubs in 2.1.4. Some create a spiral formation with multidimensional interpretations in 2.2.2 or move of KO and the vertical ∞ symbol in 2.2.4. The use of colors seems to reveal unprecedented writing structures in 2.4.2, while the dodecagonal dial translates into a hidden message revealed on the GO board as «2», the central motif in 2.4.3. Finally, the asymmetric shape of the asterisk reveals both sorrow and hope in life in 4.1.1. The contrast between the τ-shape in the grid diagram and the &-shape on the GO board is presented in 4.1.2. Structure 4.1.4 displays the shape of a two-eye diagram, while 4.2.1 reveals the St. Catalina Island geography. The displacement vector analysis opens a fascinating novel perspective on multidimensional movement in poetry. It successfully illustrates that poetry excels at using language to solve problems by applying different reading strategies, displaying greater cognitive flexibility, and developing higher-order critical thinking abilities. It is evident that ∈ is a prodigious collection of sonnets that creates a mosaic reinforcing literary, ludic, and scientific meanings.

Notes

1 Jacques Roubaud, ∈, Paris, Gallimard 1967. All quotations from ∈ come from this edition.

2 Jacques Roubaud joins the OULIPO group in 1966, around the publication date of ∈. «Mon entrée à l'OULIPO a décidé du reste de ma vie de jouer du langage», Jacques Roubaud, *La Bibliothèque de Warburg,* Paris, Seuil 2002, p. 246.

3 For a discussion on this comparison see Jean-Jacques Thomas, «Swing Troubadour: Roubaud's Self-Portrait». Retrieved 6 July 2020. http://www.dalkeyarchive.com/swing-troubadour-roubauds-self-portrait/

4 According to François Le Lionnais, the implication of science is fundamental to the interpretation of OULIPO texts as a source of potentiality: «[…] l'Ouvroir de Littérature Potentielle (OuLiPo) entend le faire systématiquement et scientifiquement», in François Le Lionnais, *La LiPo* (premier manifeste), in OuLiPo, *La Littérature potentielle*, Paris, Gallimard 1973, p 21.

5 For a nuanced account of the time aspects in Roubaud's poetry, see Elisabeth Cardonne-Arlyck, *Véracités: Ponge, Jaccottet, Roubaud, Deguy*, Paris, Belin 2009.

6 Jacques Roubaud, Jean-François Puff, *Roubaud: Jacques Roubaud / Rencontre avec Jean-François Puff*, Paris, Argol 2008, p. 59.

7 Pierre Lusson, Georges Perec, Jacques Roubaud, *Petit traité invitant à la découverte de l'art subtil du GO*, Paris, Christian Bourgois 1969.

8 Jacques Roubaud, Jean-François Puff, *Roubaud: Jacques Roubaud / Rencontre avec Jean-François Puff*, cit., p. 53.

9 Pierre Lusson, Georges Perec, Jacques Roubaud, *Petit traité invitant à la découverte de l'art subtil du GO*, cit., p. 40.

10 Peter Consenstein, «L'Énigme de la signification silencieuse» in Christelle Reggiani, Bernard Magné, *Écrire l'énigme*, Paris, Presses de l'Université Paris-Sorbonne 2007, p. 211.

11 Pierre Lusson and Jacques Roubaud developed a new reading technique called «théorie du rythme abstrait» (Abstract Rhythm Theory, ART), which has become the foundation for Roubaud's poetry.

12 Jacques Roubaud, *Poésie: (récit)*, Paris, Seuil, 2009, p. 499.

13 Pierre Lusson, Georges Perec, Jacques Roubaud, *Petit traité invitant à la découverte de l'art subtil du GO,* cit., p. 42.

14 Véronique Montémont, *Jacques Roubaud: L'amour du nombre*, Lille, Presses Universitaires du Septentrion, 2004.

15 *Ibidem*, p. 67.

16 Elvira Monika Laskowski-Caujolle, *Roubaud's Destruction: A Mathematician's Prose*, p. 8 in *The Great Fire of London by Jacques Roubaud*, Edited by Peter Consenstein, Retrieved 12 March 2020. http://www.dalkeyarchive.com/product/the-great-fire-of-london-by-jacques-roubaud/

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[17] Véronique Montémont, «JR 007 ou le secret chez Jacques Roubaud» in Christelle Reggiani, Bernard Magné, *Écrire l'énigme*, cit., p. 183.

[18] Jacqueline Guéron, «Language and Reality in the Poetry of Jacques Roubaud: an analysis of ∈» in Michael Edwards, *French Poetry Now*, Vol. 3, Skye, Aquila 1975, p. 109.

[19] Christophe Pradeau, «Le Réseau: Traboules, groupes clandestins et bifurcations dans l'œuvre de Roubaud» in Christelle Reggiani, Bernard Magné, *Écrire l'énigme*, cit., p. 165.

[20] Alison James, «Jacques Roubaud and the Ethics of Artifice» in *French Studies*, Vol. LXIII, No. I, pp. 53-65.

[21] Christophe Reig, «Jacques Roubaud: énigmes du roman/romans à énigmes» in Christelle Reggiani, Bernard Magné, *Écrire l'énigme*, cit., p. 195.

[22] Lucy O'Meara, «Jacques Roubaud's Rejection of Japoniste Influence: *Tokyo infra-ordinaire*» in *Questions of Influence in Modern French Literature*, Edited by Thomas Baldwin, James Fowler, and Ana de Medeiros, London, Palgrave Macmillan 2013.

[23] Dominique Moncond'huy conducted many comparative studies on Roubaud and Perec. See «Ouverture de la journée Perec/Roubaud – table ronde», in *Les Cahiers Roubaud*. Archives audio-visuelles, Journée d'étude Perec/Roubaud 2016. Retrieved 16 April 2020. https://roubaud.edel.univ-poitiers.fr:443/roubaud/index.php?id=213

[24] In physics, 'translation' means the process of moving an object from one place to another.

[25] See Chris Andrews, *Constraints, Poetry and Play in Jacques Roubaud's 'Parc sauvage'*, in «Australian Journal of French Studies», 49 (2), 2012, pp. 142-152.

[26] Jean-Jacques Thomas, Steven Winspur, *Poeticized Language: The Foundations of Contemporary French Poetry*. University Park, PA, The Pennsylvania State University Press 1999, p. 159.

[27] Pierre Garnier asserts that the function of a visual poem is to impress rather than be read in Pierre Garnier, *Spatialisme et poésie concrète*, Paris, Gallimard 1960, p. 202.

[28] Jean-Jacques Thomas, Steven Winspur, *Poeticized Language: The Foundations of Contemporary French Poetry*, cit., p. 173.

[29] Jean-Jacques Poucel, *Jacques Roubaud and the Invention of Memory*, Chapel Hill, University of North Carolina Press 2006, p. 117.

[30] Katheryn Mcdonald, ∈ *by Jacques Roubaud*. RIF/T: An Electronic Space for Poetry, Prose, and Poetics, Editors: Kenneth Sherwood and Loss Pequeño Glazier, ISSN#: 1070-0072, Version 4.1, Spring 1995. Retrieved 3 June 2020. http://writing.upenn.edu/epc/rift/rift04/roub0401.html

[31] Véronique Montémont, *Jacques Roubaud: L'amour du nombre,* cit., pp. 65-66.