

# Potential Quantitative Analysis as Ludic Interface in $\epsilon$ by Jacques Roubaud

*Olga Amarie, Dragos Amarie, and Lillian Morgado*

Georgia Southern University

**Abstract:**  $\epsilon$  is a book of sonnets written by the French mathematician and poet Jacques Roubaud. The book draws inspiration from a myriad of sources, most prominently from a game of GO played between Masami Shinohara and Mitsuo Takei recorded by the GO Review magazine in April 1965. Roubaud himself encourages the readers of  $\epsilon$  to read the book in multiple different orders, which the article identifies as the diagram order, the pagination order, the GO order, and the random order. This article analyzes the patterns and inconsistencies that appear when the book is read in the different orders suggested by the author. It concludes that by introducing new constraints to his poetry, Roubaud uses  $\epsilon$  as a ludic interface, inviting the reader to use the poems as an immersive game through which to challenge his or her own understanding of the relationship between games, science, and literature.

**Keywords:** Jacques Roubaud –  $\epsilon$  (*Signe d'appartenance*) – sonnet – play – GO

In his speech transcript *Lire, écrire ou comment je suis collectionneur de bibliothèques* (*Reading, Writing or How I Became a Library Collector*), Jacques Roubaud explains how he worked on two different tasks simultaneously, writing a mathematics thesis and a sonnet book:

Des recherches en vue d'une thèse de mathématique d'une part, d'autre part la composition d'un livre de poèmes pour lequel j'avais choisi de rendre hommage à une forme poétique aussi anti-surréaliste que possible, la forme sonnet. Je lisais, à cet effet, tous les sonnets qui me tombaient sous l'œil, anciens et nouveaux, aussi bien en italien, anglais, espagnol ou portugais. (24)

As a “library collector,” Roubaud frequented numerous libraries all over the world reading Italian, English, Spanish, and Portuguese sonnets in order to achieve his literary task. A profound and mysterious character, Roubaud considers himself a “composer of mathematics and poetry.” Indeed, Jacques Roubaud has two PhDs, one in French Literature and another one in Mathematics. His doctoral dissertation, *La Forme du sonnet*

*français de Marot à Malherbe. Recherche de seconde rhétorique* (*The Form of the French Sonnet from Marot to Malherbe. Research in Second Rhetoric*), is a detailed theory for French sonnets. As a university professor, he taught mathematics in Nanterre and Rennes, France. Mathematics played a major role in his career, affecting his entire literary work. As for poetry, we find the passion for sonnets in Roubaud's life engaging and rigorous. Besides writing, Roubaud practices "sonnet walking": as he walks (Reig 22), while counting his steps, he creates new mental habits that define a math poet.

The present study is an introduction to some of the writing rules of  $\epsilon$  (*Signe d'appartenance*) by Jacques Roubaud.  $\epsilon$  can arguably serve as an archetypical example of a dual text: sonnet conventions and mathematical conjectures. More precisely, this study is designed to interpret a playful reading of  $\epsilon$  rather than as a display thereof. We hope that, through an explanation of sonnet and mathematical rules, we may be able to offer a coherent exposition of Jacques Roubaud's writing theory. In addition,  $\epsilon$  is a distinctly non-uniform text, with irregular literary structures and shifty nuances, which makes the search for uniform rules far more problematic than it might be in a more traditional body of work.

The critical reception of  $\epsilon$  was mostly enthusiastic, according to Claude Roy, who compares Roubaud to a "jeune Méphisto du verbe" (282). Jean-Noël Vuarnet calls  $\epsilon$  a collection of "paroles de la radicale nouveauté" (7). Jean-Pierre Attal describes  $\epsilon$  as a "merveilleux assemblage de fraîcheur, de profondeur, d'honnêteté, de vérité" (124). The new form of sonnet expression in  $\epsilon$  produces the necessary freedom for creativity and play: "Each sonnet, perfect within its borders, would also entertain relations with all the other sonnets; each would open onto the overarching structure, the book, which would in turn reveal shared formal and other elements among the poems comprising it" (Smock). Speaking about sonnet form and punctuation, Gérard Dessons (188), Jacques Drillon (61), and Nina Catach (73) analyzed the intriguing presence and mostly the absence of typographical devices, spacing, and conventional signs of punctuation in  $\epsilon$ . Jacqueline Guéron sees that Roubaud's poetry is not conceivable without mathematics. She says that the presence of mathematical signs in a literary work creates semantic ambiguities (Guéron 109).

In *Jacques Roubaud, compositeur de mathématique et de poésie* edited by Agnès Disson and Véronique Montémont, critics talk about mathematics and literature, graphs, squares, groups, numbers (Gérald Tenenbaum 39; Olivier Salon 45; Marcel Benabou 57), the Japanese style (Agnès Disson 249), sonnets and memory, (Dominique Moncond'huy 279; David Christoffel 369), circles, spirals, and movement (Christine Jérusalem 111). Caroline Naphegyi and Christophe Coffrant are fascinated by the representation of GO in  $\epsilon$  (Naphegyi and Coffrant 29-32). Olga Amarie and Dragos Amarie focus on the displacement vector analysis on the GO board in  $\epsilon$  (Amarie and Amarie 107-18). But the most revealing is Roubaud himself who describes several of his writing techniques in *Poésie* and *Description du projet* to help the reader understand  $\epsilon$ . With all of the above in

mind, the present study wishes to promote  $\mathcal{E}$ , a work that engages any reader; that analyzes the impact between literature and other discourses (ludic, scientific, and philosophical); that takes poetry as invitation, even provocation, to further reflection.

The word “sonnet” is derived from the Latin *sonus*, meaning “sound.” In Italian, the word *sonetto* refers to a short poem or song. The literary device itself, fourteen lines and a strict rhyme scheme, was first attested in the thirteenth century by the Italian poet Giacomo da Lentini.<sup>1</sup> Other famous early sonneteers include Dante Alighieri, Francesco Petrarca, and Michelangelo di Lodovico Buonarroti Simoni. They all followed the argument model of a typical sonnet, referred today as the *Petrarchan sonnet* style, or 4-4-3-3: formulating a problem in the rhyming *octave* and providing a resolution in the rhyming *sestet*, with a turning point between the eighth and the ninth lines – the *volta*. While the Petrarchan sonnet was developed over time by a number of Renaissance poets, Petrarca remained the most prolific among them (Spiller). Later, William Shakespeare, Pierre de Ronsard, and Joachim du Bellay, among many, imitated and promoted the Petrarchan sonnet. The basic structure of the Shakespearean sonnet is 4-4-4-2: formulating a problem or establishing a theme in three rhyming *quatrains* and providing a resolution in the rhyming *couplet*, with a *volta* between the twelfth and the thirteenth lines (Mabillard). While keeping the constraints of the fixed versification and meter, these poets showed great flexibility with the language:

L'imitation s'égare ; au lieu de développer l'élément vivant du Canzoniere, l'élément idyllique, élégiaque, réaliste, elle s'acharne sur les défauts les plus frappants. Ce qui attire les imitateurs, c'est la recherche prétentieuse, les pointes raffinées, les pensées plus ingénieuses que justes, les sentiments alambiqués, les jeux de mots insipides, qui sont plus faciles à reproduire que les élans de l'imagination et les cris du cœur.<sup>2</sup> (Piéri 23)

Nonetheless, after the eighteenth century, poets have significantly modified these fixed rhyme patterns and relied more and more on new forms of sonnets. Charles Baudelaire used to great effect thirty-two new forms of sonnets in *Les Fleurs du mal*, thus creating a “new thrill,” *un nouveau frisson*, in world literature (Hugo; Sanyal 19). These famous sonneteers played with the language and invented new writing techniques, thus revealing that there is an effective link between language and play.

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<sup>1</sup> Giacomo da Lentini (also called Jacopo il Notaro) was credited with the invention of the sonnet. His poetry includes sonnets, canzoni, tenzone, and discordo on the theme of courtly love and ethics. Some of his sonnets were written in conjunction with other poets forming a unified voice. Collective poetry is a creative technique adopted by the OULIPO group as well.

<sup>2</sup> The imitation goes astray; instead of developing the living element of Canzoniere, the idyllic, elegiac, and realistic element, it strives for the most striking defects. What attracts the imitators is the pretentious search, the refined tips, the more ingenious than the right thoughts, the convoluted feelings, the insipid word games, which are easier to reproduce than the imagination impulses and the heart screams.

Many authors engaged in language play to some extent, but certain authors were particularly committed to or adept at language play as a major feature of their work. Ludwig Wittgenstein, in his book *Philosophical Investigations*, deconstructed the Augustinian picture of language and introduced the theoretical notion of “language-game” consisting of a wide range of actions into which a language is woven. Wittgenstein put forth “language-game” as an important thought experiment, where every word has a meaning and creates images for readers. He went as far as to compare language games with architectural works, thus his builders’ language-game used exactly four terms: block, pillar, slab, beam (Wittgenstein 2). Raymond Queneau’s language games, popularized in *Zazie dans le métro* (*Zazie in the Metro*), have made him a noted author who acts, speaks, and writes in a witty and jocular way. Similarly, Georges Perec was hailed by the media as a comic writer, language player, and an expert of formal techniques for his own ingenious language games in *La Disparition*, *Les Revenentes*, *Je me souviens*, etc. According to François Le Lionnais, Oulipian formal constraints are “the next stage in the evolution of human expression” (Le Lionnais 20). By the same token, Jacques Bens, a founding member of the OULIPO<sup>3</sup> and former “definitively provisional secretary”<sup>4</sup> of the group, invented the irrational sonnet in 1963, a constraint based on the irrational number  $\pi$ , with the approximation 3.1415. The “irrational” structure offers five stanzas composed of 3-1-4-1-5 verses per stanza, rather than an infinite number of stanzas. The sum of these numbers is 14, which is homage to the number of lines in a traditional sonnet. Jacques Bens called this constraint the *Oulipolée* and published *41 Irrational Sonnets* in 1965 (Bens). Surprisingly, he uses the number 41 which is a rational, prime number but its transposed digits resonate with the number of lines in a classic sonnet. In 1967, Jacques Roubaud wrote his own collection of unconventional sonnets,  $\epsilon$  (*Signe d’appartenance*). In 1969, Roubaud, in collaboration with Georges Perec and Pierre Lusson<sup>5</sup>, published the *Petit traité invitant à la découverte de l’art subtil du GO* (*Brief Treatise Inviting One to Discover the Subtle Art of GO*), an introduction to the Japanese game of GO, its history, rules, and subsequently the philosophy of this game. The authors argued that there is only one activity to which the GO could reasonably compare: writing.

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<sup>3</sup> Ouvroir de Littérature Potentielle (OULIPO, the Workshop for Potential Literature) is a French group of writers and scientists founded in 1960 by Raymond Queneau and François Le Lionnais working conjunctly on constrained texts.

<sup>4</sup> OULIPO has two secretaries, “a provisionally definitive secretary and a definitively provisional secretary” (“secrétaire définitivement provisoire et secrétaire provisoirement définitif”) who keep assiduous minutes of each meeting. Currently, Marcel Bénabou serves as both, “a provisionally definitive secretary and a definitively provisional secretary of the group.”

<sup>5</sup> Pierre Lusson (1950-) is a mathematician, musicologist, and co-founder of the Centre de poésie comparée (Center for Comparative Poetry).

### Unconventional Sonnets: Prose and Verse

From the beginning of his writing career, Roubaud was more concerned with metatextual forms than with reference to a historical truth. Jean-Jacques Poucel gives clear explanations about history, truth, and memory in Roubaud's works (Poucel 247-248). Writing under constraint gave Roubaud more conscious mastery, establishing a new economy of focused attention. The writer focused more on formal aspects of the text and less on historical facts and truthfulness; it is precisely the role of the formal constraint, its relative artificiality that enabled him to do this so distinctly. It is interesting to note that Roubaud used the term sonnet as a transmissible form of life ("L'Auteur oulipien" 85-86), a formal mystery with excessive artificiality. Queneau was right to say that there is nothing more artificial than the sonnet (140).

$\epsilon$  is a collection of 361 sonnets, where Roubaud developed the metaphor of writing and chose to give each sonnet the value of a pawn in GO. Although  $\epsilon$  is considered partially Oulipian, according to the *OULIPO: Atlas de littérature potentielle* (*OULIPO: A Primer of Potential Literature*), the GO constraint is a technical *tour de force*, very often displaced. In this article, we show that Roubaud does not hesitate to depart from his principles established before composing the text. He does not limit the poetic or narrative effects; according to him, the essence of writing is not the formal constraint, but its potentiality (Roubaud *La Bibliothèque de Warburg* 242), a notion embedded in the group's name: OUVroir de LIttérature POtentielle.

Another founding member of the OULIPO group was Claude Berge<sup>6</sup> and in his booklet *Raymond Queneau et la combinatoire*, he puts Queneau's works *Cent mille milliards de poèmes* (*Hundred Thousand Billion Poems*) and *Un conte à votre façon* (*Yours for the Telling*) in the same combinatorial category as  $\epsilon$  by Jacques Roubaud. The *Hundred Thousand Billion Poems* is a collection of 10 sonnets, where each line can be recombined to form a new sonnet. *Yours for the Telling* is a comic story with multiple solutions, where the reader can combine a certain number of scenarios from a table to get a new ending. In the same spirit, the sonnets in  $\epsilon$  can be read following the rules of motion in GO, thus all these works use diverse combinatorial techniques.

The title of the book,  $\epsilon$ , is a mathematical symbol used in set theory – a branch of mathematical logic that studies collections of objects. The symbol  $\epsilon$  communicates the relationship of an object to a set of objects described by a certain property. A simple mathematical sentence can be  $1 \in \mathbb{N}$ , where 1 is a whole number and  $\mathbb{N}$  is the set of positive, whole numbers. In plain language, it reads "1 is an element of  $\mathbb{N}$ ," "1 is a member of  $\mathbb{N}$ ," "1 belongs to  $\mathbb{N}$ ," "1 is in  $\mathbb{N}$ ," "1 lies in  $\mathbb{N}$ ," " $\mathbb{N}$  includes 1," or " $\mathbb{N}$  contains 1." It is the result of an imbrications process, mainly two elements overlapping together to form a new concept, which Roubaud calls "a symbol of thought" ( $\epsilon 11$ ). Some mathematicians

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<sup>6</sup> Claude Jacques Berge (1926 – 2002) was a French mathematician, recognized as one of the modern founders of combinatorics and graph theory. He also enjoyed literature, sculpture, and art.

rejected the idea of  $\epsilon$  as a foundation for mathematics, arguing that it is just a structured tool with elements of creative imagination. By selecting  $\epsilon$  as a title, Roubaud showed interest in mathematical and literary structures, overlapping forms and genres for Oulipian writing. By extension, he saw this symbol as a metaphor for human beings belonging to the world ( $\epsilon$  11).

$\epsilon$  is a first-person narrative and poem unevenly balanced throughout the book and situated in an imaginary prison where the sun, time, water, forests, and objects are hidden or forced to go away. Roubaud, in the user's guide of his book, names existing or new genre labels to classify his text: sonnets, short sonnets, interrupted sonnets, prose sonnets, short prose sonnets, quotations, illustrations, diagrams, white texts, black texts, poems, and prose poems. The text imitates the style of a *haibun*, a prosimetric genre: a mixture of prose and poetry in literature consisting of a paragraph or two of prose and one or more haiku. It was used for the first time by the seventeenth-century Japanese poet Matsuo Bashō in 1690. Roubaud's *haibun* is heteroglossic and multivoiced because it displays the coexistence and conflict among different types of speech: the speech of characters, the speech of narrator and lyrical subject, and even the speech of the author. Furthermore, in her article "Jacques Roubaud's Rejection of Japoniste Influence: *Tokyo infra-ordinaire*," Lucy O'Meara (178) argues that Japanese poets such as Matsuo Bashō need to be considered as experimental writers. Even though they describe natural beauty and landscapes, their goal is to practice their craft in a parodic and oppositional way.

The first part ( $\epsilon$  13-38), a first-person narrative with no punctuation, retraces a voyage with initiatory implications, where it seems as if time ceases to exist in an instant, and the anonymous hero is trapped in a state of contemplation and thought. Considering different gender markers, the reader can notice that the narrator is a male, "Je ne vois plus le soleil ni l'eau ni l'herbe m'étant emprisonné où nul matin n'a de domaine" ( $\epsilon$  15), "condamné," "prisonnier" ( $\epsilon$  31). He is indifferent and does not belong to a single space or time. Elsewhere, the narrator looks for voyages that enrich the symbolist intelligence and imagination. The author calls, in this narrative sonnet, for a shift in perspective where space and time are no longer fundamental, organizing human knowledge and creative thought. The narrator belongs to street intersections, hieroglyphs, and contradictions. He relates to a timeless place where everything begins: the void, the plasma, the calculus, the living. He does not immediately notice that there is no sign of life. However, this power is not about what the narrator can or cannot do, but rather it is a reason to belong: the desire to create attachments as a fundamental human motivation. The narrator condemns the idea of sense, seeing and hearing, because he wants to be calm, far away, and free. He is looking into a diversity of refuges: in the infinitesimally small subatomic particles, in the purity of colors, among the ultrasound waves that shatter the rock; something new in an old language, where words come to be "salt and game" ( $\epsilon$  20-21). Words and images change very quickly in this narrative, making it impossible to make sense of the stream of information that assails the reader in each moment: "pour

délimiter une fois l'année exacte d'un escargot sur une vitre d'un mur déchiré sous une abeille" ("in order to separate for once the exact year of a snail on a glass wall torn under a bee") (€ 22).

The narrative progresses in small paragraphs or stanzas, but words and images dissipate as quickly as smoke and refuse to create meaning, substance, or fluency of ideas. Alison James claims in her article "Jacques Roubaud and the Ethics of Artifice" that the accumulated clauses of Roubaud's prose trace the progression of memory from vision to recognition, and finally to comprehension – first of the object portrayed, then of the point of origin of this vision. She discusses a double photograph from the first volume of *Le Grand incendie de Londres*, where the viewer is invited to discover the point of origin in the photographer's gaze and the image's source (James 55). Crucially, nothing is true but the time of narration. As the story unravels, everything seems false, mostly as an incoherent or vague line of thought with no clear trajectory or destination. The narrator, who seems to escape any frame of identity at times, "je suis soir et neutre" (€ 15), appears to be from a different world, "je ne suis pas du monde" (€ 35), and represents chapter zero in this book-game. The narrator wants to say farewell to this small world to which he belongs, but something is holding him back. Everything seems trivial, lacking influence or power, limited in degree or significance: words, notebooks, stories, morals, and the world. Roubaud often evades truthfulness in his prose to create a strategic or a rhetorical move. The reader learns next to nothing about the narrator's life. Before getting lost, there needs to be a recognizable path. What good is a song if it has no message to bring, or if people have diminished sensitivity to sounds? Why come back as a ghost if you were not alive in the first place?

The narrator saw many dead bodies, but the only dead person is himself, "la vie glissante" (€ 23), "j'ai vu mille morts et le seul mort c'est moi" (€ 31). On this earth, he wore different masks and was always dead. Death is victorious as it possesses everything. And it is on this death note that the first part comes to a close.

In the beginning (€ 1-38), the narrator seems to define himself as a storyteller. Then, he suddenly dives into the second part and his new role: verse (€ 39-142) constitutes in itself almost two thirds of the book and it quickly becomes apparent that the short narrative at the beginning is nothing but a genre experiment. The narrator, or more precisely the lyrical subject, is now a poet. He had barely begun to write in prose when words started to produce exacerbated lyricism and incantations. The narrator experienced an unsettling sensation in the first part of the book, and it was impossible for him to state its precise meaning. However, the uneasy sensation did nothing but grow paragraph by paragraph. The disturbing feeling is now a swarming surge of pain: "une douleur acérée comme une grille" ("a sharp pain like a grid") (€ 43). The poet compares himself to an object of hesitant pain, who still controls time before despair: "le temps bien en main" ("time well in hand") (€ 45). He also has a laughing enemy, who has red socks and carries him away. Together, they are two pink hearts warped by a spell of Bram

Stoker's legend *Dracula*, where love is much stronger than pain or death. The poet wants his voice to be heard by the world, but the world comes to a halt phase. Roubaud's metaphor of writing delves further into Paul Klee's abstract art and Giorgio de Chirico's metaphysical art, both mentioned on page 54. Artists have always inspired poets, especially modernist poets of the 20<sup>th</sup> century, who saw ugliness and destruction in their methods. Yet for Roubaud, modernism and visual arts appear to be potential and regenerative in history and possibility. Giorgio de Chirico's painting *Melancholy and Mystery of a Street* (1914) directly inspired Roubaud's thoughts:

○ [GO 74]  
la première ombre est celle des piliers  
et la deuxième est l'ombre des cieux verts  
la troisième ombre est soleil ocre hanches  
de la bâtisse aux quinze voûtes blanche  
puis dans l'ombre de l'ombre l'escalier  
tombe l'ombre de l'homme qui vient vers

sur tout est l'Ombre qui est par l'état  
du monde sur le soleil sur tant d'ombre  
plus noire que carré aveugle arcade  
derrière l'ombre première plus sombre  
et rien ne vous garde (€ 55)

○ [GO 74]  
the first shadow is that of the pillars  
and the second is the shadow of the green heavens  
the third shade is sun ocher hips  
from the building to the fifteen white arches  
then in the shadow of the shadow the staircase  
falls the shadow of the man who comes to

on everything is the Shadow that is by the state  
of the world on the sun on so many shadows  
more black than square blind arcade  
behind the darker first shadow  
and nothing keeps you

Here, the street is desolate, and the world is portrayed as if in limbo or in a dream. Long and dark shadows accompany every movement and building, emphasizing imminent tragedy. Exaggerated perspectives give the illusion of ominous unreality through spatial distortion. A banal empty street appears beautiful, mysterious, melancholic, and yet disturbingly sinister. Every corner, column, and window have been captured bathed in an afternoon sun in autumn, and they all gaze at the spectator, as if possessing a spirit, an impenetrable soul.

It was as if the words and images that the lyrical subject had before his eyes could suddenly occupy any place on his page, setting themselves in the order in which he wanted them to be; as if the juxtaposition of each one came to superimpose itself, the mind, both obscure and precise. These words and images will be no different in verse as they were in prose: more trivial than human anecdotes, saltier than humor, limpid or hermetic, constantly oscillating between hallucinated imagination and serene reality. As Roubaud acknowledges in *La Dissolution*, the difference between Oulipian poetic forms and Oulipian narrative forms, their potentiality, have yet to be clearly defined. Their principles, identified so far by various members of the OULIPO group, do not exactly coincide.

The specificity of Oulipian prose and verse is a mystery, but their formal rules are strategic, logical, and very often transparent, "peut-être trop soulignée" (maybe too much emphasized) (Roubaud *L'Auteur oulipien* 85). Moreover, the OULIPO invented forms and



constraints in a new excessive way to naturalize and conform the constraint, even if all conventional rules are arbitrary in relation to the language of composition. What is the point of insisting on formal constraints? The answer is that it opens a fascinating research discussion on the ludic interface.

### Potential Analysis of Jacques Roubaud's $\epsilon$ through GO

In this section, we apply Roubaud's reading strategies combined with critical thinking abilities and the eyes of a scientist, hoping to reveal and display the greater cognitive flexibility of his book.  $\epsilon$  is a collection of 361 poems. Roubaud claims that his work is based on the game of GO played between Masami Shinohara and Mitsuo Takei (winner) analyzed by the *GO Review* magazine 5(4) in April 1965 ( $\epsilon$  8, 144). The whole play, move by move, is available online as a downloadable smart game format (.sgf) file. (Hubert "Jacques Roubaud -  $\epsilon$ ") This play has 200 moves, but Roubaud chooses to stop the play at move 157 and the resulting pattern of GO stones is of interest in this book ( $\epsilon$  144).

When analyzing  $\epsilon$  through GO, the reader must understand the mechanics of the game. In the game of GO the black stone always plays first. The first black stone on the board constitutes a handicap for the white as its choices to play are now one position less on the grid. In general, a handicap stone is an extra stone placed on the grid before the play starts and is given to the less experienced player to offset the strength difference

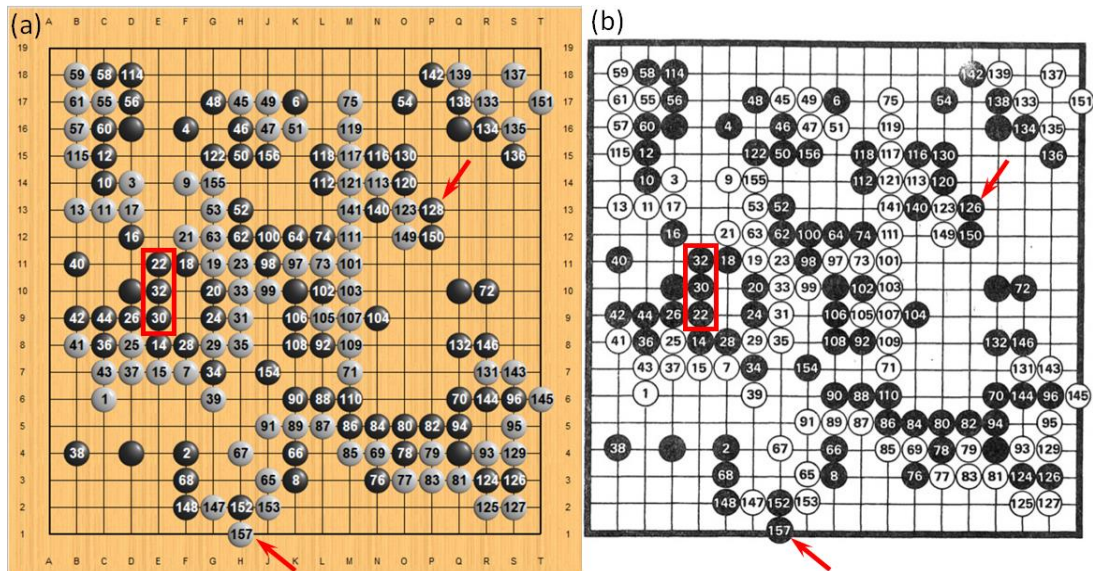


Figure 1. Comparison between the original play of the Masami Shinohara and Mitsuo Takei at move 157 from Hubert's online source (a) and the App. 4. Representation of the Game Match ( $\epsilon$  144) provided by Roubaud (b).

between players of different ranks. This advantage can be in the form of extra stones placed at well-defined positions (fixed placement) or at players will (free placement). The handicap stones are therefore an extra challenge for the white and allows black to start with a plan before the first move. The seven unnumbered black stones on the board are handicap stones. Roubaud himself 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” (“This game is a handicap game, Mitsuo Takei (black) having 7 black stones placed ahead of time in places traditionally reserved for this effect”) ( $\epsilon$  143).

In this play, the seven handicap stones were placed symmetrically, one close to each corner, diagonally inwards within a 4 by 4 position from the very corner. The other three stones were positions on the horizontal midline, with the two side stones aligned vertically with the first four and one at the center of the GO board. A close analysis of the original play in comparison to Roubaud’s *App. 4. Representation of the Game Match* ( $\epsilon$  144) brings to surface a number of inconsistencies (Fig. 1). Firstly, on the vertical line E, we see one cyclic permutation of the stones 22, 32, and 30 (Fig. 1.a), whereas in Roubaud’s  $\epsilon$  the presented order is 32, 30, and 22 (Fig. 1.b), as if stone 22 was repositioned from the top of the set to the bottom of the set thus pushing the other stones up. A rectangular red box is used to mark the set in both representations (Fig. 1). Secondly, stone 128 at position (13, P) on the board, is misnumbered as stone 126 in Roubaud’s  $\epsilon$ , thus generating a duplicate stone 126. Thirdly, the last stone 157 at position (1, H) is presented as a black stone in Roubaud’s  $\epsilon$ , instead of a white stone as in the original game. In this

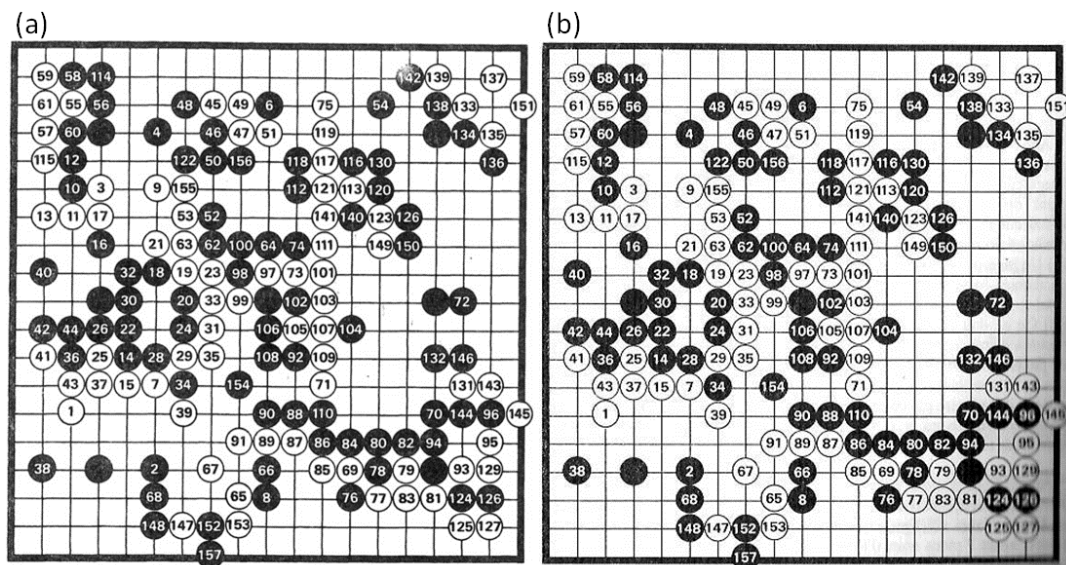


Figure 2. Roubaud’s representation (a) and Hubert’s representation of the game of GO between Masami Shinohara and Mitsuo Takei. Visual elements (e.g. see stone 142 in (a) and the right side or lower right corner in (b)) prove that we are dealing with different copies of the same original.

game of GO the black starts the play with 7 handicap stones. As a result, the white stones are all odd numbers and the black stones are all even numbers.

These inconsistencies are somewhat puzzling as we could not decide if they are Roubaud's *clinamen*, in a ludic style, or simple printing errors. We do not have access to the original game or to the *GO Review* preprint of 1965 published by The Nihon Kiin – Japan GO Association. However, Jérôme Hubert, the president of the Club de l'Ouest Parisien (West Parisian Club), Ile-de-France League under the Fédération Française de GO (French GO Federation) and a French GO instructor, (Hubert “Jeu De Go”) made publicly available another copy of the same representation of the play (see Fig. 2.b) (Hubert “© Jacques Roubaud © Gallimard, 1967”).

A visual analysis of these two artifacts makes us think of a printing error carried over in Roubaud's  $\mathcal{E}$ . It is worth noticing that during the play at move 32, white stones placed on the board at moves 5 and 27 were captured and removed from the board. As such, the representation of the game match ( $\mathcal{E}$  144) has only 155 numbered stones and 7 unnumbered handicap stones. However, these two captured stones [GO 5] and [GO 27] have poems assigned to them in Roubaud's  $\mathcal{E}$ . Some poems are accompanied by citations, symbols, or illustrations, whereas others refer to famous paintings. In  $\mathcal{E}$ , only 157 of the poems are numbered. All poems are separated into five different sets or chapters each titled with a mathematical symbol, except for the fifth chapter that has no title (see Appendix 1). In the book, Roubaud decided to call any of these five chapters a “paragraphe,” as presented for example in subunits 1.0 Disposition ( $\mathcal{E}$  14), 3.0 disposition ( $\mathcal{E}$  90) or 5.0 Argument ( $\mathcal{E}$  136). The book also includes several paratextual elements: § 0 User's Manual for this book, Definition of Used Symbols, Appendix: Instruction for the game of GO, App. 4. Representation of the Game Match, Bibliography, Table I, and Table II. Roubaud also divides the sonnets into groups based on the color of the stones: the first group has 180 *pions blancs* (white stones) and the second group has 181 *pions noirs* (black stones). To accompany this detailed structure of the book, in chapter zero Roubaud offers the reader four distinct ways to read his work. The first method is to read groups of poems based on the title diagrams preceding certain groups of poems. In this reading, each group is considered independent of the others. These grid diagrams are present in chapters 2 and 4. We call this method the *Diagram Order*. The second method recommended by Roubaud is to read the poems in the order presented in the book, following the succession of the pages, thus grouping them in those five chapters. We call this method the *Pagination Order*. The third recommended method is to read those 157 poems following the succession of the moves in the game of GO ( $\mathcal{E}$  144). We call this the *GO Order*. The fourth recommended method is to read the poems randomly and as independent of each other ( $\mathcal{E}$  9). We call this method the *Random Order*. This analysis investigates the relationship between the sequence of the sonnets as they unravel in the book and the associated sequence of GO moves as they are not consecutive.

Under the *GO Order*, Roubaud seems to evoke the feeling of a game of GO while gradually altering the definition of a sonnet. The numbered poems can be divided roughly into three groups: traditional sonnets, transitional sonnets, and sonnets in prose, with traditional sonnets being [GO 1] through [GO 17], transitional sonnets from [GO 18] to [GO 109] and sonnets in prose from [GO 110] to [GO 157]. As the game progresses, the poems become less and less traditional sonnets (see Appendix 2). If a sonnet is defined as a poem in 14 lines, then [GO 1] through [GO 17] are all traditional sonnets with rhythmic structure. Poems [GO 18] through [GO 109] are a mix of traditional sonnets and other forms, while poems [GO 110] through [GO 157] are all sonnets in prose with only two exceptions. Poem [GO 144] is a traditional sonnet and the second to last poem, [GO 156], is a set of dots indicating an ellipsis. A good example of Roubaud's adjustment of expectation in a transitional sonnet is *bris sonore!... (broken sound!...)* [GO 109] (€ 48):

bris sonore ! fragments mésange !  
 que du Nord pourpoint œillet d'iode  
 nous viennent ces violons candi  
 depuis l'humide qu'un visa ge

soupçonnant le sel taise un autre  
 le mil les menthes dans la bouche  
 (toit de la terre et que c'est douc e  
 demeure de cris) que de l'eau

remue contre le limon cil  
 au pouls de la pente que tourne  
 la respirant lande mûr e

rien n'est et nous perdrons sous l'inc l  
 émence du temps étranger  
 l'espoir des arbres retourner

The poem has no apparent rhyme scheme when read as written, but a rhyme scheme emerges if missing letters are inserted into the last words on several lines. However, making it rhyme changes the meaning of the words and makes the poem nonsense (*douc e* becomes *douche*) forcing the reader to decide what is more important to the poem, its meaning or its rhyme.

Since Roubaud is a mathematics professor, one cannot stop but wonder if this book is seeded with more *clinamina*, thus conceiving a ludic interface of intricacies. To enable means of analysis and diagnostics, in Appendix 2, we present the poems following the *Go Order* and use Table II (€ 153) to bring together the GO move number and page number in search for mathematical correlations. Since prime numbers are a common

attraction, both in literature (Glaz “Ode to Prime Numbers”; “The Poetry of Prime Numbers”) as in cinema,<sup>7</sup> we searched for sets of prime numbers. We found 10 sets of paired prime numbers spread across the book: poem [GO 1] is on page 111, poem [GO 17] is on page 113, poem [GO 61] is on page 61, poem [GO 67] is on page 67, poem [GO 71] is on page 47, poem [GO 73] is on page 47, poem [GO 79] is on page 97, poem [GO 101] is on page 79, poem [GO 137] is on page 19, and poem [GO 149] is on page 131. All these numbers are prime numbers.

Another clinamen under investigation is the digit transposition, a mathematical operation that results in the positions of two digits in a number being switched. For example, poem [GO 34] is on page 43, whereas poem [GO 79] is on page 97. Other attractive idiosyncrasies are double digits, same digits, consecutive page transposition, or multiples of ten difference, as presented below. For example, poem [GO 44] is on page 66 and poem [GO 55] is also on page 66, and all the numbers are double digits. At the same time, poem [GO 61] is on page 61 and poem [GO 67] is on page 67, the same digits. The consecutive page transposition comes as a triplet, poems [GO 136], [GO 137], and [GO 138] are on pages 91, 19, and 91, thus forming a zigzag of three. Difference in multiples of ten comes in seven different flavors, as the recorded differences are 10, 20, 30, 50, 60, 100, and 110. As such, five poems present a difference of ten (poem [GO 78] is on page 68, poem [GO 92] is on page 102, poem [GO 94] is on page 104, poem [GO 111] is on page 121, and poem [GO 149] is on page 139), two poems present a difference of twenty (poem [GO 102] is on page 82 and poem [GO 64] is on page 84), three poems present a difference of thirty (poem [GO 19] is on page 49, poem [GO 93] is on page 63, and poem [GO 95] is on page 125), two poems present a difference of fifty (poem [GO 81] is on page 131 and poem [GO 142] is on page 92), one poem presents a difference of sixty (poem [GO 156] is on page 96), two poems present a difference of one hundred (poem [GO 115] is on page 15 and poem [GO 117] is on page 17), and poem [GO 1] is on page 111 presents a difference of one hundred and ten.

Our analysis continues with *Pagination Order*. This time, these 157 poems are organized based on their page rather than GO move order. Appendix 3 compiles all the building blocks of the book, its chapters, subunits, and structures. Also, we investigated the assigned stone colors with respect to the color of the GO stone on the board, as well as the number of lines in each structure.

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<sup>7</sup> In Zemeckis’ film *Contact*, a scientist discovers an alien signal composed of prime numbers. The Costanzo’s Italian film *La Solitudine Dei Numeri Primi* narrates the traumatic childhood and early adulthood of a boy and a girl, both outsiders, through the uniqueness of prime numbers among other numbers. In Natali’s film *Cube*, seven individuals, trapped in an industrialized cube-shaped endless maze containing deadly trap-rooms, learn that any room marked with a prime number contains a trap.



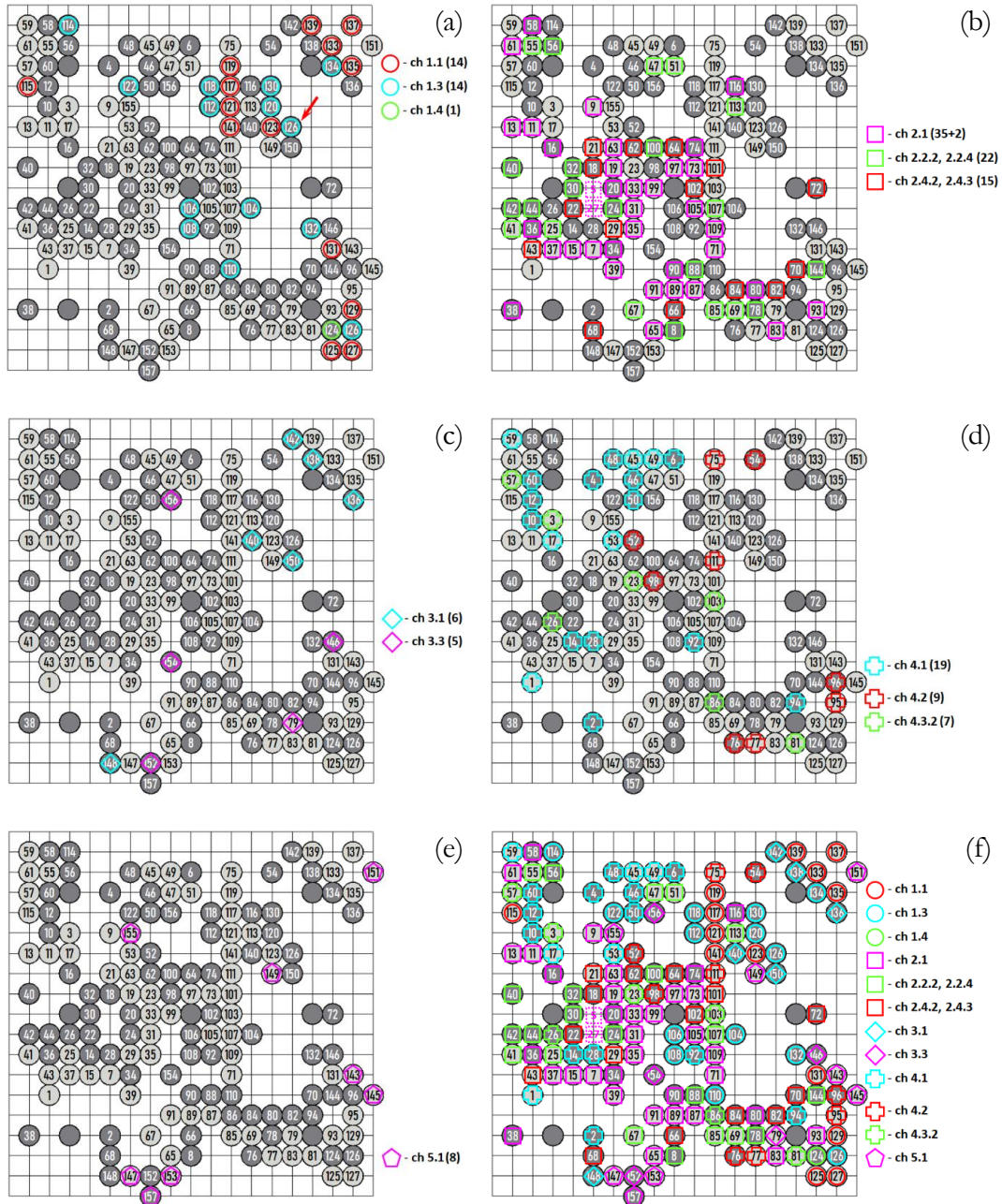


Figure 3. Visual representation of the chapter and subunit distribution over the GO board. (a) chapter 1 with 29 GO sonnets, (b) chapter 2 with 74 GO sonnets, (c) chapter 3 with 11 GO sonnets, (d) chapter 4 with 35 GO sonnets, (e) chapter 5 with 8 GO sonnets, and all chapters filling up the board with 157 GO sonnets.

Many discrepancies were noticed and marked accordingly. For example, out of 157 GO poems, 33 poems associated with an even GO move number are marked as white stones instead of black stones and 37 poems associated with an odd GO move number are marked as black stones instead of white stones. At the same time, Fig. 3 was created as a visual representation of all poems, divided per chapters and subunits, and meant to show how these poems distribute across the GO board, thus hoping to reinforce the trend of ludic interface previously noticed. In Fig. 3, all chapters are marked with a different shape symbol and each subunit within each chapter is marked with a different color. As distributed on the GO board, we investigate the out coming visual patterns. Chapter 1 (§ 1 €) favors the first quadrant of the board (the top-right region) the most, favors the fourth quadrant (the lower-right region) less, and favors the other two quadrants sparingly (Fig 3.a). Its 29 sonnets are in prose and organized in three subunits as two sonnets of sonnets, 14 sonnets plus another 14 sonnets (€ 14), and one more sonnet of 14 lines (Appendix 3). A further visual investigation of the distribution of the GO poems on the board, and with a bit of imagination since we are talking about a ludic interface after all, will reveal the shape of 2 horizontal, mirror image, € symbols (Fig. 4) that makes one contemplate the idea of the two sonnets of sonnets in this chapter. There are 14 sonnets in *1.1 Premier Sonnet*. All sonnets are associated with an odd GO move number. As selected by Roubaud, the color of the associated GO stone alternates; however, this conflicts with the actual color of the stone on the GO board. Sonnets [GO 131, 117, 135, 137, 141, and 125] are presented as black stones in the book, but these are all white stones on the board. As a matter of fact, all the poems in this unit should be white stones. There are also 14 sonnets in *1.3 Deuxième Sonnet*. All these sonnets are associated with an even GO move number. This implies that all the stones should be black, however, Roubaud marked poems [GO 112, 130, 128, 122, 126, 104, 120, and 110]

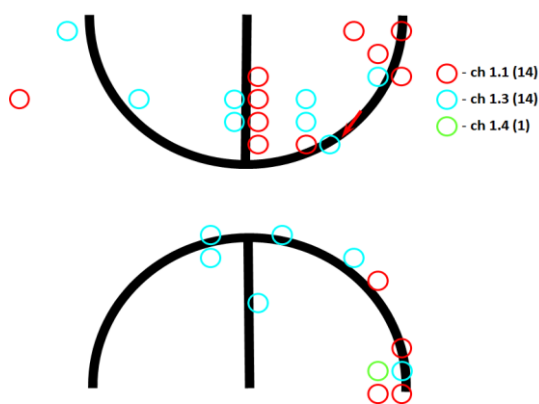


Figure 4. Visual representation showing the distribution of GO poems from chapter 1 in the shape of a two, horizontal mirror image € symbols.

as white stones when they are black stones on the GO board. The last poem of the chapter, a standalone poem, as subunit 1.4, is marked with a white stone instead of a black stone.

Chapter 2 (§ 2 ⇨) is the largest in size and has very dense distributions of stones, with 74 GO poems. It covers well the center of the GO board with an extension in the fourth quadrant, resembling a horizontal Yin with its Yang eye located at the [GO 5] and [GO 27], the captured stones (Fig. 5). Few poems however reach the far corner of the second quadrant, sparingly the corner of the third quadrant, and only [GO 116] and [GO 113]

are in the middle of the first quadrant. The distribution of the odd and even GO move numbers is more convoluted, presenting subunit 2.1 with 37 poems organized as 5 even, 12 odd, 1 even, 2 odd, 1 even, 1 odd, 1 even, 9 odd (including the captured stones), 1 even, 3 odd, and 1 even; subunit 2.2 (which is not specifically defined but left as a set of two structures 2.2.2 and 2.2.4) with 22 poems organized as 1 even, 1 odd, 1 even, 1 odd, 1 even, 1 odd, 2 even, 2 odd, 1 even, 4 odd, 6 even, and 1 odd; and subunit 2.4 (which, again, is not specifically defined but left as a set of two structures 2.4.2 and 2.4.3) with 15 poems organized as 2 even, 4 odd, and 9 even.

Subsection 2.1 is made of 4 grid diagrams: *Dénué*, *Refuges*, *Forêt*, and *Cité* (Devoid of, Refuges, Forest, and City), Structure 2.1.1 has 9 poems, but only 5 are GO poems, all even numbers. Poem [GO 16] is reported as a white stone instead of a black stone. With this correction all the GO poems would be black stones. It also has 4 poems marked with a colored stone but not associated with any GO move: three are white stones and one is a black stone (Appendix 3). The second of these “je suis revenu de la poussière orange des déserts” (“I came back from the orange dust of deserts”) (*€* 45) refers to Roubaud’s time in the French military during the Algerian War. Structure 2.1.2 has 10 GO poems, all odd. Poems [GO 11, 71, 19, and 65] are reported as black stones instead of white stones. With this correction all the GO poems would be white stones. Poem GO [109] has no stone associated with it, but it should be a white stone (Appendix 3). Poem GO [109] is made of two non-traditional poems even if both have 14 lines and the second is structured as a vertical grid. Structure 2.1.3 has 13 poems, but only 8 are GO poems, of which 5 are odd and 3 are even. All but 2 have the wrong color. [GO 35, 37, 89, and 83] have black stones instead of white stones, whereas [GO 36 and 74] have white stones instead of black stones associated with them. The first three poems without any GO association are allusions to famous paintings. The first is a vague reference to a painting of Gustave Moreau entitled *Hercule et l’Hydre de Lerne* (*Hercules and the Lernaean Hydra*) that

was described as “Un frisson d’épouvante hérissé les rochers et convulse le désert d’un gris violet, strié de sang” (Schuré 683) (“A shiver of terror bristles the rocks and convulses the desert of a purple gray, streaked with blood”), thus resonating with Roubaud’s impression of being “dans le gris musical en quelque Lerne” (“in the musical grey in some Lerna”) (*€* 52). Lerna is a municipality in Greece located between the mountains and the sea near the east coast of

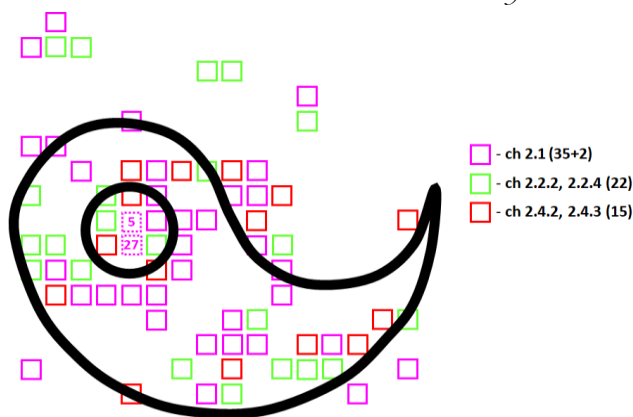


Figure 5. Visual representation showing the distribution of GO poems from chapter 2 in the shape of a horizontal Yin symbol with a Yang eye at the location of the captured stones.



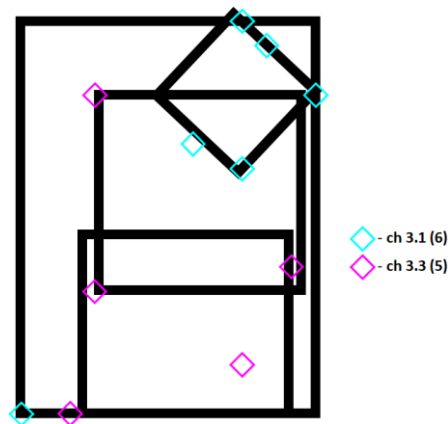


Figure 6. Visual representation showing the distribution of GO poems from chapter 3 in the shape of a square but with multiple possible arrangements of the GO board.

Peloponnese Island famous for the Lake of Lerna (Alcyonian Lake) where Hercules killed the mythical Hydra in ancient Greece. The second and third poems without a GO move association ( $\in 54$ ) are clear references as they speak of two famous paintings: the “*tableau de Paul Klee*” (“painting by Paul Klee”) and “*tableau de Giorgio de Chirico*” (“painting by Giorgio de Chirico”). Structure 2.1.4 has 15 poems, but only 14 are GO poems, of which 12 are odd and 2 are even, distributed as 9 odd, 1 even, 3 odd, and 1 even. Among them, 6 have the wrong color, [GO 5, 13, 15, 31, 39, and 93] being reported as black stones instead of white stones.

While section 2.2 is not defined specifically, it is composed of two structures: *Élégies et jardins* (*Elegies and gardens*) and *Nuit devant*

*la nuit* (Night before night). Structure 2.2.2 has 18 poems of which 15 are GO poems. Their parity fluctuates as 1 even, 1 odd, 1 even, 1 odd, 1 even, 1 odd, 2 even, 2 odd, 1 even, and 4 odd. Among them, 5 have the wrong color, [GO 55, 67, 113, and 41] being reported as black stones instead of white stones and [GO 100] being reported as a white stone instead of a black stone. The first poem, in German and without a GO move association, is the first stanza of sonnet IV in *Die Sonette an Orpheus* (*Sonnets to Orpheus*) by Rainer Maria Rilke. The second is a reference to a drawing by Samivel. Samivel, born in 1907 in Paris, France as Paul Gayet-Tancrède, was a writer, poet, graphic designer, and filmmaker who illustrated the book *Goupil – Sur un thème du roman de Renart*. Structure 2.2.4 has 7 GO poems, with 6 even and 1 odd. Among them, 3 are reported as white stones instead of black stones. All poems have 14 lines.

Also, section 2.4 is not defined specifically, but it is composed of two structures: *couleurs* (*colors*) and *vue* (*view*). Structure 2.4.2 has 11 poems but only 6 are GO poems, of which 2 are even and 4 are odd. Among them, 3 are reported as black stones instead of white stones, and one [GO 29] has no stone associated with it. Structure 2.4.3 also has 11 poems but only 9 are GO poems, and all are even. They are all reported as white stones instead of black stones.

Chapter 3 (§ 3 □) is rather small in size, with only 11 GO poems. Their distribution on the GO board is weakly represented with most of the poems located in the first quadrant and sparingly in the others: one poem in the second quadrant, 3 poems in the third quadrant, and 2 poems in the fourth quadrant. A visual investigation of such distribution proves challenging and one can come with a number of square shape representations giving the reader the opportunity to select, as their imagination dictates, the one that better represents the □ symbol (Fig. 6). Subunit 3.0 *disposition* instructs the

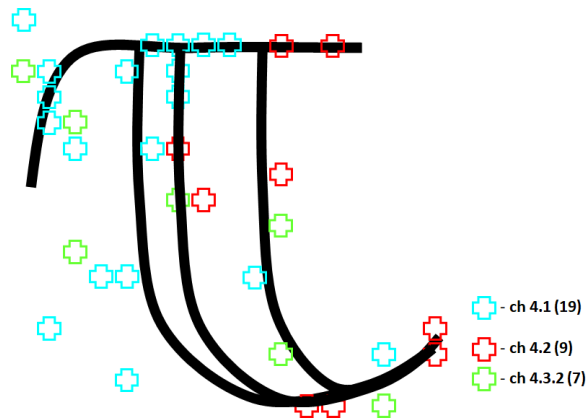


Figure 7. Visual representation showing the distribution of GO poems from chapter 4 in the shape of Greek letter tau ( $\tau$ ) across the GO board.

reader about “ce paragraphe est un sonnet court de sonnets courts en prose” (“this paragraph is a short sonnet of short sonnets in prose”), and as Appendix 3 shows structure 3.1 has 6 sonnets in prose, one with 10 lines, two with 11 lines, two with 13 lines and only one with 14 lines, whereas structure 3.3 has five sonnets in prose, one of 7 lines, one of 12 lines, one of 13 lines, and the last two, [GO 156] and [GO 179], contain one line of ellipses. When investigating their distribution on the GO board, no particular shape resemblance emerges (Fig. 3.c). All poems have even GO move numbers

except for the last one, structure 3.3.5, a line of ellipses, which is marked as [GO 79] with a black stone instead of a white stone.

Chapter 4 (§ 4  $\tau$ ) is the second largest chapter with 35 GO poems. On the GO board, it covers mostly the second quadrant, but few others are present, such as 3 poems in the first quadrant, 5 poems in the second quadrant, and 8 poems in the fourth quadrant. A visual investigation of their distribution reveals the shape of the Greek letter  $\tau$ , the name of the chapter (Fig. 7). The distribution of the odd and even GO move numbers is convoluted. Subunit 4.1 is presenting 32 poems with only 19 GO poems divided in 3 structures, 4.1.1, 4.1.2, and 4.1.4 (no 4.1.3) and their parity cycles along the pages as 7 even, 1 odd, 2 even, 2 odd, 1 even, 1 odd, 1 even, 2 odd, and 2 even (Appendix 3). Structure 4.1.1 has 9 poems, but only 4 are GO poems, all even numbers and all correctly assigned to black stones. Structure 4.1.2 has 8 poems, but only 6 are GO poems and all are even, although 2 have the wrong color. Poems [GO 10] and [GO 60] are associated with white stones instead of black stones. Structure 4.1.4 has 15 poems, but only 9 are GO poems, with 5 odd and 4 even numbers. They are all assigned to white stones, however, 2 have the wrong color. Poems [GO 6] and [GO 28] are associated with white stones instead of black stones (Appendix 3).

Subunit 4.2 contains only one substructure, 4.2.1, with an inner sub-substructure where each element is titled and labeled with Roman numerals from I to IX. Structure 4.2.1 has 18 poems of which 9 are GO poems, with 5 even and 4 odd. They are all assigned to black stones however, 4 of them have the wrong color. Poems [GO 111], [GO 75], [GO 77], and [GO 95] are associated with black stones instead of white stones (Appendix 3).

There is no specific subunit 4.3 but there is a structure 4.3.2 with 11 poems out of which 7 are GO poems. Among them 5 are odd and 2 are even of which three have

GO stones of wrong color. Poems [GO 57] and [GO 81] were assigned to black stones instead of white stones, whereas poem [GO 86] was assigned to a white stone instead of a black stone.

Chapter 5 (§ 5 ) is the smallest of them all with only 10 poems, of which only 8 are GO poems. This chapter has no symbol in the title. On the GO board the poems are distributed diagonally with two GO poems in the first quadrant, one in the second quadrant, three in the third quadrant, and two in the fourth quadrant. A visual examination of their distribution could reveal the shape of an ✕ (diagonal cross) symbol often used to disapprove, deny, or reject a statement (Fig. 8). This is mostly suggested by Roubaud's argument in subunit 5.0 "Ce paragraphe est un sonnet à trois tercets, de sonnets en prose. On ne donnera ici que les deux premiers quatrains" ("This chapter is a sonnet with three tercets, composed of prose sonnets. Herein, we will provide the first two quatrains") (€ 136), suggesting that this chapter is not finished, not ready, and more work needs to be done. All poems are odd and in consecutive order of odd numbers. The color of the associated stones alternates, starting with a white stone; however, four have the wrong color thus reported as black stones instead of white stones. It is worth mentioning that the last poem is [GO 157] and is marked with a black stone. When compared to Roubaud's representation of the GO game match (€ 144), the association would be correct, however, as discussed above, this could be a typographic error. In the real game of GO this stone was a white stone. Between the two sets of four poems (the two quatrains), there are structures 5.1.5 and 5.1.6. They are associated with a white and a black stone respectively, but not to a GO move number. They refer to two illustrations: the first is the famous painting of Madonna of Chancellor Rolin by Jan van Eyck (€ 139) and the second is a view of the Ourcq Canal near the Parisian cemetery of Pantin (€ 140).

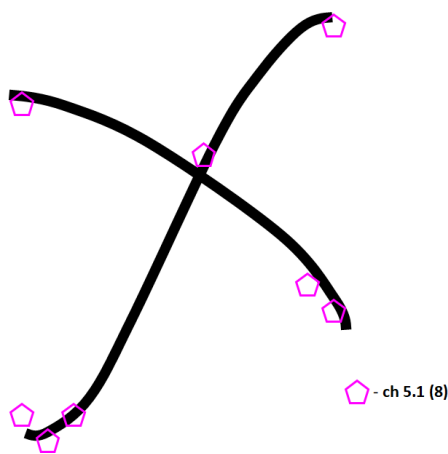


Figure 8. Visual representation showing the distribution of GO poems from chapter 5 in the shape of ✕ symbol across the GO board.

Under the *Diagram Order* a completely different world emerges. The title diagrams preceding some sections of poems sometimes represent potential move sets available in GO, such as the set of sonnets 4.1.4 *expériences* (4.1.4 *experiences*) (See Appendix 3, to be read vertically, for different structural systems used in €), in which Roubaud explicitly states "Ces pions, blancs, forment deux « yeux » ou « me »." ("These stones, white, form two 'eyes' or 'me'.") (€ 110) In *The Way to GO: How to Play the Asian Game of GO*, Karl Baker defines an eye as "a single point fully enclosed by one color" (Baker 27). Two linked eyes in GO prevent an opponent from breaking up a grouping of player's stones, which is why the following section is entirely comprised of white stone poems and no black stone poems. However, though the

poems are labeled as white stones, there are two poems that are considered black stone poems (€ 144). Both [GO 28] *voyez vous,...* (*do you see,...*) (€ 114) and [GO 6] *dans le froid* (*in the cold*) (€ 112) are labeled in the back as black stones (€ 144). Diagram 2.2.4 *Nuit devant la nuit*, (€ 73) is a diagram of the GO move. KO (€ 73) also features an inconsistency. Roubaud explains: “Ko, qui signifie « éternité » ou « infini » est, dans le jeu, une porte par où s’engouffreraient tous les pions” (“Ko, which signifies ‘eternity’ or ‘infinity’ is, in the game, a door through which would engulf all the stones”) (€ 73). Baker defines KO as “a common position that would allow an endless series of meaningless plays if there were no rule to cover the situation” (*The Way to GO: How to Play the Asian Game of GO* 37). Through using the move of KO, a player captures his opponent’s game piece and converts the captured piece to one of his own. In theory, this move could be performed infinitely with the same piece being captured and recaptured, bringing the game to a standstill. Therefore, repetition of the move in an attempt to recapture the piece is against the rules.

Once again, the formation of the poems on the presented grid diagram (€ 73) does not match the formation of the poems’ corresponding to the GO stones in the table (€ 144). Roubaud himself admits when first explaining the fashion of reading that he did not intend to formally and exactly follow the game, instead he attempted to achieve a poetic image of the game (€ 8). The poems being out of order mimics the movement of the game board; the readers’ eyes have to jump around the game board seemingly at random in order to interpret the course of the game, much like how they must read the parts of the book in a counterintuitive order. By analyzing the book through the game of GO, however, the problem is that there are multiple poems, citations, and descriptions of illustrations that are assigned a color, but not assigned a number, and are therefore presumably not included through reading the collection of poetry through the game. The exclusion of major parts of the collection reveals the limitations of reading strictly using the *GO Order*. Through poems such as *bris sonore!...* (*broken sound!...*) [GO 109] (€ 48), Roubaud reveals that he too recognizes the limitations of rigid by-the-rules interpretations of poetry, hence his inclusion of so many methods of reading. By organizing the progress of the game under the *Pagination Order*, Roubaud mimics the joy of looking at the finished game of GO. Much like the stones themselves, the poems are placed in a seemingly random fashion and it is difficult to parse the order of action without a great deal of investigative work and in-depth analyses, both requiring a lot of reflection time. Roubaud decided to base the book on a specific game of GO, while at the same time only adhering to the emotional sense of confusion and strategy present in the board game.

The pattern consistent in the whole volume is that of gradual deviation. Roubaud begins with his inspiration (the board game, the idea of a sonnet, and the original passages) and then changes it while trying to preserve its poetic essence. The game of GO is converted to the form of a book which must be read out of order to evoke how a game of GO progresses around the board. He incorporates moves and techniques of the game

into the title diagram preceding sections of poems to ensure that the theme is present even in the other methods of reading the poems. The individual citations are transformed into solitary poems, but because they span the entire book, GO and the idea of sonnets undergo more dramatic transformations. The game transforms from numbered sequence into a more general motif and the sonnet is expanded to include chapters, paragraphs, subunits, and structures.

## Conclusion

The writing rules of  $\epsilon$  by Jacques Roubaud serve indeed a dual purpose: sonnet conventions and mathematical conjectures. The reader can play along with the author, narrator, and lyrical subject in order to identify the consistencies and irregularities in the text or the GO match. The ludic interface imposed by Roubaud stimulates this work at many highly intricate levels showing great potentiality for this work of art. The GO game component is just an intertwined and multi-faceted example of literary expression and forms of wit that describe the sonnet theory in Roubaud's writing. These entertainment techniques are primarily used for improving and challenging one's critical thinking, analytical skills, and creative imagination. Roubaud's work serves as a good example of how poetry can become so much more – a virtual reality for readers to explore in a wide, multi-dimensional range of intellectual competences. By inserting formal constraints Roubaud takes an innovative approach to sonnet writing, going against centuries of dogma driving this literary genre. Without knowing these constraints, the text seems cryptic, impenetrable, and even specious. As soon as it is revealed, the constraint becomes an important tool that forces one to overcome the obstacles of reading, writing, and interpretation. The goal of writing under formal constraint, where the constraint is a universal mathematical language, is to better understand the relationship between games, science, and literature. Literature, through the mathematical language of a constraint, can be shared universally regardless of cultural background. Roubaud, no matter how structured his texts are, is very dependent on this ludic and imaginative medium. It is difficult to think from a completely new prospective, such as realizing that you can read poetry following the shape of a calligram, graph, or grid. Because the mathematical constraint is coined out of the universal mathematical language, one can still progress when reading the text for the first time, unaware of the imposed constraints. One would take the traditional approach to reading a book, and then use their imagination in conjuncture with the set constraint to work out the "fine print" and discover nuances and connections "beyond what you see." However, there are no guarantees. Depending on the complexity and the extent of the constraint, one may require more contemplation, or, indeed, consider it a mystery.

**APPENDIX 1**

§0	Mode d'emploi de ce livre
§1	$\mathcal{E}$
§2	$\supset$
§3	$\square$
§4	$\tau$
§5	

## APPENDIX 2

[GO #]	Page	Lines	[GO #]	Page	Lines	[GO #]	Page	Lines	[GO #]	Page	Lines
1	111	14	41	70	11	81	131	14	121	19	12* <sup>8</sup>
2	105	14	42	76	14	82	86	14	122	31	14*
3	128	14	43	80	11	83	55	11	123	22	10*
4	106	14	44	66	14	84	87	14	124	37	14*
5	57	14	45	108	11	85	71	11	125	22	17*
6	112	14	46	117	14	86	133	14	126	32	12*
7	58	14	47	72	11	87	48	11	127	20	10*
8	74	14	48	108	14	88	75	14	128	30	14*
9	46	14	49	115	14	89	54	11	129	23	14*
10	107	14	50	117	14	90	56	11	130	28	16*
11	46	14	51	73	11	91	62	11	131	15	14*
12	107	14	52	126	14	92	102	14	132	33	18*
13	58	14	53	116	14	93	63	14	133	16	15*
14	102	14	54	120	14	94	104	11	134	30	16*
15	59	14	55	66	14	95	125	14	135	17	15*
16	42	14	56	69	14	96	127	11	136	91	11*
17	113	14	57	129	14	97	63	14	137	19	15*
18	78	11	58	62	14	98	124	14	138	91	10*
19	49	14	59	111	14	99	51	14	139	21	15*
20	41	11	60	109	14	100	71	9	140	92	11*
21	80	11	61	61	14	101	79	11	141	20	11*
22	78	11	62	83	14	102	82	14	142	92	13*
23	128	14	63	50	11	103	132	14	143	137	19*
24	76	14	64	84	14	104	33	11*	144	69	14
25	70	11	65	50	11	105	53	12	145	138	14*
26	130	14	66	84	14	106	35	12*	146	95	13*
27	60	11	67	67	14	107	72	14	147	138	9*
28	114	14	68	85	14	108	31	12*	148	93	14*
29	82	11	69	77	14	109	48	14	149	139	20*
30	65	14	70	85	14	110	35	12*	150	93	13*
31	60	11	71	47	14	111	121	14	151	140	21*
32	74	14	72	87	14	112	27	14*	152	95	12*
33	60	11	73	47	11	113	68	14	153	141	21*
34	43	14	74	55	11	114	27	13*	154	96	8*
35	51	11	75	122	14	115	15	13*	155	141	9*

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<sup>8</sup> \*- marks sonnets in prose. While there is no clear cut between verse and prose, and this subject would be open for debates, we took the liberty and marked some of these sonnets as sonnets in prose (see also Roubaud's instructions  $\in 90$ ) in order to show Roubaud's trend of moving away from the traditional sonnet.

36	53	11	76	119	14	116	64	14	156	96	1
37	52	10	77	123	14	117	17	11*	157	142	18*
38	44	14	78	68	14	118	29	16*			
39	61	11	79	97	1	119	18	14*			
40	75	14	80	42	11	120	34	17*			



## APPENDIX 3

chapter	subunit	structure	GO move	color correction	lines
§ 0 Mode d'emploi de ce livre	0.1	0.1.1			6† <sup>9</sup>
		0.1.2			8†
		0.1.3			5†
	0.2	0.2.1			7†
		0.2.2			3†
		0.2.3			2†
	0.3	0.3.1			4†
		0.3.2			5†
		0.3.3			4†
	0.4	0.4.1			8†
		0.4.2			7†
	0.5				3†
§ 1 ∈	1.0 Disposition				4†
	1.1 Premier sonnet	1.1.1	○ [GO 115]	○	13‡ <sup>10</sup>
		1.1.2	● [GO 131]	○ × <sup>11</sup>	14‡
		1.1.3	○ [GO 133]	○	15‡
		1.1.4	● [GO 117]	○ ×	11‡
		1.1.5	○	GO [□] <sup>12</sup>	1†
		1.1.6	● [GO 135]	○ ×	15‡
		1.1.7	○ [GO 119]	○	14‡
		1.1.8	● [GO 137]	○ ×	15‡
		1.1.9	○ [GO 121]	○	12‡
		1.1.10	●	GO [□]	1†
		1.1.11	○ [GO 127]	○	10‡
		1.1.12	● [GO 141]	○ ×	11‡
		1.1.13	○ [GO 139]	○	15‡
		1.1.14	●	GO [□]	1†
		1.1.15	○ [GO 123]	○	10‡
		1.1.16	● [GO 125]	○ ×	17‡
		1.1.17	○ [GO 129]	○	14‡
	1.2		●	GO [□]	1†

<sup>9</sup> †- instructions for the reader about the book.

<sup>10</sup> ‡- marks sonnets in prose.

<sup>11</sup> × - mismatch in stone color, odd number only. We used the original game of GO as a reference in marking these differences.

<sup>12</sup> □ - marks missing element, either the GO move number or the stone color associated to a GO move.

	1.3 Deuxième sonnet	1.3.1	○ [GO 112]	● ×× <sup>13</sup>	14‡
		1.3.2	● [GO 114]	●	13‡
		1.3.3	○ [GO 130]	● ××	16‡
		1.3.4	● [GO 118]	●	16‡
		1.3.5	○	GO [□]	1†
		1.3.6	● [GO 134]	●	16‡
		1.3.7	○ [GO 128]	● ××	14‡
		1.3.8	● [GO 108]	●	12‡
		1.3.9	○ [GO 122]	● ××	14‡
		1.3.10	●	GO [□]	1†
		1.3.11	○ [GO 126]	● ××	12‡
		1.3.12	● [GO 132]	●	18‡
		1.3.13	○ [GO 104]	● ××	11‡
		1.3.14	●	GO [□]	1†
		1.3.15	○ [GO 120]	● ××	17‡
		1.3.16	● [GO 106]	●	12‡
		1.3.17	○ [GO 110]	● ××	12‡
		1.3.18	●	GO [□]	1†
	1.4		○ [GO 124]	● ××	14‡
§ 2 ⊃	2.1	2.1.1 Dénué	● [GO 20]	●	11
			○ [GO 16]	● ××	14
			● [GO 80]	●	11
			○	GO [□]	2* <sup>14</sup>
			● [GO 34]	●	14
			○	GO [□]	9‡
			● [GO 38]	●	14
			○	GO [□]	2*
			●	GO [□]	18‡
		2.1.2 Refuges	○ [GO 9]	○	14
			● [GO 11]	○ ×	14
			○ [GO 73]	○	11
			[GO 11-73]		
			● [GO 71]	○ ×	14
			○ [GO 87]	○	11
[GO 109]	○ □		14+14 <sup>15</sup>		
● [GO 19]	○ ×		14		
2.1.3 Forêt	○ [GO 63]	○	11		
	● [GO 65]	○ ×	11		
	○ [GO 99]	○	14		
	● [GO 35]	○ ×	11		

<sup>13</sup> ×× - mismatch in stone color, even move number only. We used the original game of GO as a reference in marking these differences.

<sup>14</sup> \* - marks the text that includes a line of ellipses.

<sup>15</sup> Complex structure, one sonnet of 14 lines is followed by one vertical grid poem “no\*\* th\*\* in\* \*g\*”

			<ul style="list-style-type: none"> <li>○</li> <li>● [GO 37]</li> <li>○ [GO 36]</li> <li>○ [GO 105]</li> <li>● [GO 89]</li> <li>○</li> <li>●</li> <li>○ [GO 74]</li> <li>● [GO 83]</li> <li>○</li> <li>● [GO 90]</li> <li>○</li> </ul>	<ul style="list-style-type: none"> <li>GO [□]</li> <li>○ ×</li> <li>● ××</li> <li>○</li> <li>○ ×</li> <li>GO [□]</li> <li>GO [□]</li> <li>● ××</li> <li>○ ×</li> <li>GO [□]</li> <li>●</li> <li>GO [□]</li> </ul>	<ul style="list-style-type: none"> <li>2*</li> <li>11</li> <li>11</li> <li>12</li> <li>13-16**16</li> <li>1</li> <li>1</li> <li>11</li> <li>11</li> <li>8‡</li> <li>11</li> <li>12</li> </ul>
		2.1.4 Cité	<ul style="list-style-type: none"> <li>● [GO 5]</li> <li>○ [GO 7]</li> <li>● [GO 13]</li> <li>○</li> <li>● [GO 15]</li> <li>○ [GO 27]</li> <li>● [GO 31]</li> <li>○ [GO 33]</li> <li>● [GO 39]</li> <li>○ [GO 61]</li> <li>● [GO 58]</li> <li>○ [GO 91]</li> <li>● [GO 93]</li> <li>○ [GO 97]</li> <li>● [GO 116]</li> </ul>	<ul style="list-style-type: none"> <li>○ ×</li> <li>○</li> <li>○ ×</li> <li>○ ×</li> <li>○</li> <li>○ ×</li> <li>○</li> <li>○ ×</li> <li>○</li> <li>○</li> <li>○ ×</li> <li>○</li> <li>○</li> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>14</li> <li>14</li> <li>14</li> <li>3*</li> <li>14</li> <li>11</li> <li>11</li> <li>11</li> <li>11</li> <li>15</li> <li>14</li> <li>11</li> <li>11</li> <li>14</li> <li>14</li> </ul>
		2.2.2 Elégies et jardins	<ul style="list-style-type: none"> <li>● [GO 30]</li> <li>●</li> <li>● [GO 55]</li> <li>●</li> <li>● [GO 44]</li> <li>● [GO 67]</li> <li>● [GO 78]</li> <li>● [GO 113]</li> <li>● [GO 56]</li> <li>● [GO 144]</li> <li>● [GO 41]</li> <li>○ [GO 25]</li> <li>○ [GO 100]</li> <li>○</li> <li>○ [GO 85]</li> <li>○ [GO 107]</li> </ul>	<ul style="list-style-type: none"> <li>●</li> <li>○ ×</li> <li>●</li> <li>○ ×</li> <li>●</li> <li>○ ×</li> <li>●</li> <li>○ ×</li> <li>●</li> <li>○ ×</li> <li>○</li> <li>● ××</li> <li>○</li> <li>○</li> </ul>	<ul style="list-style-type: none"> <li>14-16**</li> <li>4+1<sup>17</sup></li> <li>14-15**</li> <li>1+1</li> <li>14-15**</li> <li>14-19**</li> <li>14</li> <li>14</li> <li>14-15**</li> <li>14-21**</li> <li>11</li> <li>11</li> <li>9-11**</li> <li>1*</li> <li>11</li> <li>13</li> </ul>

<sup>16</sup> \*\* - marks a complex structure that can be considered with any number of lines within provided range.

<sup>17</sup> + - marks the number of extra lines adjacent to the poem that contains references, instructions, or notes for the reader.

			○ [GO 47] ○ [GO 51]	○ ○	11 11
		2.2.4 Nuit devant la nuit	● [GO 8] ● [GO 32] ● [GO 88] ○ [GO 40] ○ [GO 24] ○ [GO 42] ○ [GO 69]	● ● ● ● ×× ● ×× ● ×× ○	14 14 14 14 14 14 14
		2.4.2 couleurs	● [GO 22] ● [GO 18] ○ ● [GO 101] ○ ● [GO 43] ○ ● [GO 21] ○ ○ [GO 29]	● ●  ○ ×  ○ ×  ○ ×  ○ □	11+1 11+1 1 11 2 11 2 11 8 2 11
		2.4.3 vue	○ [GO 102] ○ [GO 62] ○ ○ [GO 64] ○ [GO 66] ○ [GO 68] ○ [GO 70] ○ ○ [GO 82] ○ [GO 84] ○ [GO 72]	● ×× ● ××  ● ×× ● ×× ● ×× ● ××  ● ×× ● ×× ● ××	14 14 1 14 14+1 14 14 1 14 14 14
	3.0 disposition				1†
	3.1	3.1.1 l'ovale	● [GO 136]	●	11‡
		3.1.2 tilleul	● [GO 138]	●	10‡
		3.1.3 jappement de lessives	● [GO 140]	●	11‡
		3.1.4 pourtant la nuit encore	● [GO 142]	●	13‡
		3.1.5 traversant	● [GO 148]	●	14‡
		3.1.6 faucons	● [GO 150]	●	13‡
	3.2		●		1
	3.3	3.3.1	● [GO 146]	●	13‡
		3.3.2	● [GO 152]	●	12‡
		3.3.3	● [GO 154]	●	7+1‡
		3.3.4	● [GO 156]	●	1*
		3.3.5	● [GO 79]	○ ×	1*

§ 4 τ	4.1	4.1.1 *		• • • [GO 92] • [GO 14] • • [GO 94] • • • [GO 2]	• • • •	1 8 14 14 24 11 20 13 14
		4.1.2 gel noir		• [GO 4] ○ [GO 10] • [GO 12] ○ [GO 45] • [GO 48] ○ [GO 60] ○ •	• • ×× • ○ • • ××	14 14 14 11 14 14 20 4+1
		4.1.4 expériences		○ [GO 59] ○ [GO 1] ○ ○ [GO 6] ○ ○ [GO 17] ○ ○ [GO 28] ○ ○ [GO 49] ○ ○ [GO 53] ○ ○ [GO 46] ○ [GO 50]	○ ○ • ×× ○ • ×× ○ ○ ○ • ×× ○ ○ • ×× • ××	14 14 6+2 14 0+4 14 1* 14 1+2 14 17 14 1 14 14
	4.2	4.2.1 Santa Catalina island sonnets	I : tu m'es vocale...	• [GO 76] ○	•	14 20+1
			II : ville de la rudesse...	• [GO 54] ○	•	14 2+1
			III : vues fixes	• [GO 111] ○	○ ×	14 9+1
			IV : sur l'agrume gris	• [GO 75] ○	○ ×	6/14 <sup>18</sup> 12
			V : : ! eagles, cap sur les schooners!...	• [GO 77] ○	○ ×	14+1 20+1

<sup>18</sup> Double structure, in the text it occupies 6 lines, but groups of words are separated by en dashes and both the quatrains and the tercets are formed and separated by double en dashes, whereas the two quatrains are separated from the two tercets by a triple en dash, thus resulting in 14 verses.

			VI : si le cœur est autre...	● [GO 98] ○	●	7/14 <sup>19</sup> 18+3 <sup>20</sup>
			VII : Jardin de roses à Oakland	● [GO 95] ○	○ ×	15+1 1
			VIII : city of Avalon !...	● [GO 52] ○ ●	●	14 11 8+1
			IX : est-il exil si total...	○ [GO 96]	● ××	11-13 <sup>**</sup>
			4.3.2 adresses  lire à la suite	○ [GO 3] ○ [GO 23] ● [GO 57] ● [GO 26] ○ ● [GO 81] ○ ○ [GO 103] ○ ○ [GO 86] ●	○ ○ ○ × ● ○ × ○ ○ ● ××	14 14 14 14 10+1 14 22-27 <sup>**</sup> +1 <sup>**†</sup> 15 12 <sup>***</sup> +1 14 14+1
§ 5	5.0 Argument					2
	5.1	5.1.1	○ [GO 143]	○		19 <sup>‡</sup>
		5.1.2	● [GO 145]	○ ×		14 <sup>‡</sup>
		5.1.3	○ [GO 147]	○		9 <sup>‡</sup>
		5.1.4	● [GO 149]	○ ×		21 <sup>‡</sup>
		5.1.5	○			1+2
		5.1.6	●			1+1
		5.1.7	○ [GO 151]	○		21 <sup>‡</sup>
		5.1.8	● [GO 153]	○ ×		21 <sup>‡</sup>
		5.1.9	○ [GO 155]	○		9 <sup>‡</sup>
		5.1.10	● [GO 157]	● <sup>21</sup>		18 <sup>‡</sup>

<sup>19</sup> Double structure in the text, it occupies 7 lines, but groups of words are separated by en dashes and the quatrains and the tercets are separated by double en dashes, resulting in 14 verses.

<sup>20</sup> Machine dialog.

<sup>21</sup> Stone color is correct according to the GO play representation at page 144. However, this color is wrong if we were to compare with the actual game of GO where all the stones associated to an odd move index were White stones. As showed above, the GO play representation on page 144 has 5 errors when compared with the original play presented in the *GO Review*.

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