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“The proteiform graph itself  
is a polyhedron of scripture”

CLASSIC  
**Joyce**

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# “*The proteiform graph itself is a polyhedron of scripture*”<sup>1</sup>

Enrico Frattaroli

These reflections of mine are the account of a ‘private’ exploration, not aimed at a publication on, but at a *mise-en-écoute* of, *Giacomo Joyce*. I retrace here the salient steps of a journey that is not yet concluded (neither the exploration nor the staging) in which I will seek to clarify, for myself as much as for the reader, the reasoning that informed my procedure.

## “*A form of speech : the lesser for the greater*”<sup>2</sup>

The white(ness) of *GJ* is a black hole that sucks in, and in which is voided, any attempt to describe the nature of a text which is so slight, yet so sharp, impalpable yet dense, whose most impenetrable matter — the most intractable, I would say — is the void. And in offering a description, one cannot escape from the task of attributing a value to the void — a substantial, strategic, textual value. The void can be neither eluded nor ellided because on the void rests the graphic *ordo* and on the graphic *ordo* the textual system of *GJ*. The void determines the *physical nature* of the text: to describe *GJ* in terms of its writing, leaving to one side the void, would be akin to describing the mind in terms of thought, leaving to one side the brain.

The text is not limited to the writing, it is together both blank, empty space and writing; but as it is impossible to attach clear meanings to the void which can be directly related to the writing, one gives up on attributing to it *its* sense in the construction of the text. In short, one gives up on the text. If *GJ* is the least appreciated, least studied of all of Joyce’s works, it is because, having given up on the void, one gives up on evaluating exactly what it is that renders it *unique* in the Joycean macrotext.

## *A limpid enigma*

The question demanding our attention from the very first approach is on what basis, and with what criteria, and according to what inscrutable principle, did Joyce divide the textual material of *GJ* into unequal and discrete entities, laid out in *that* unequal sequence of writing and blank, empty space. Clear yet cryptic, the answer is laid out and flows before our eyes every time that we cross and recross the text: tangible yet ineffable, perfectly evident yet quite ungraspable. Thus the questions about those complex but entirely intuitable problems, to which we are tempted to give simple solutions, assume the form of an enigma. From the moment in which the enigmatic *ordo* is determined by the unusual extension of white space on the page, the enigma becomes, quite simply, whiteness, the empty space of the page. The question “what does the empty space mean?” soon arises to render the enigma still more enigmatic and unresolvable, because in *GJ* the empty space as such carries no significance whatsoever, it only acquires sense in the system of the text.

What this means is that to acquire sense the empty space must not borrow sense from the writing, it must remain ‘empty’. Its sense lies entirely in its being void, because it is exclusively from the void that the graphic and visual dimension of *GJ* comes into being, and upon which it is founded. Without the void, the text would be an unimaginable sequence of paragraphs. The void is, therefore, already text without being writing, it cooperates with the writing, remaining graphic. Similarly, writing cooperates with the void, remaining word. Writing & Void: profoundly separate and closely overlapping in a single textual system. Where then is the enigma?

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<sup>1</sup> *Finnegans Wake* (London: Faber and Faber, 1976, p.107).

<sup>2</sup> *Giacomo Joyce*, I, verso.

A return to the original state of the manuscript text, the production of graphs on the basis of tests conducted on the facsimile of the manuscript, the inserting of the text into a *fuzzy* conceptual perspective, the hypothesis of an investigation along artificial neural networks — these are the stages of my progressive drawing close to *GJ*. My contribution, if not to resolving the enigma, then at least to exploring it.

### **Which text?**

My exploration begins with an axiomatic operation: *the assumption of the text in the absolute irreducibility of its manuscript state*.<sup>3</sup> This is the enacting of a desire: the desire to *see* the text, to have before my eyes the pages which Joyce had before his, to look at it, to touch it, to thumb through and read it, as Joyce looked at it, touched it, thumbed through, read and reread it. These desires derive from the conviction that the text cannot not coincide with the manuscript, that the manuscript is *the* text, is the referent for any reading.

In Joyce's handwriting — author, subject and scribe of his work — *GJ* conserves an aura of uniqueness, of ineffability, of irremissible corporeity, which it is difficult to drag oneself away from in the act of *perception*. I wonder whether Joyce deliberately did not publish it so that it might remain a manuscript, unique and unreproducible. Although it cannot be taken as confirmation, the fact that he did not make it available for printing, but did produce a fair copy of it, leaving no traces of work in progress, makes this hypothesis an attractive one.

I consider my *mise-en-facsimile* to be the first *mise-en-graphie* of *GJ*. A tautologous operation but not a sterile one:

Giacomo Joyce  
is

A handwritten signature in cursive script that reads "Giacomo Joyce". The letters are fluid and connected, with a prominent 'G' and 'J'.

which means: *only in its manuscript state is the text given in all its expressive integrity*. The reading of *GJ* commences with the graphic, with space, with the image, with a gaze thrown *upon* the text.

There is a reading of *GJ* that occurs before and after the reading of the written *laissez*.<sup>4</sup> To allow the gaze to fluctuate *over* the manuscript without entering into the writing is an integral part of the reading of this text (which, perhaps, can not be said of any other text, not even any by Joyce himself). While we observe the discrete and unequal extension of the *laissez* of writing on the surface of the sheets — the differing ways they arrange themselves on the pages, the variable density of the lines, the ever unequal alternating of blank space and written matter, the mutable play of combinations on adjoining surfaces — the text prepares us for the right form of reading.

In allowing itself to be physically perceived, the manuscript initiates the readers, instructing them about its *nature* as text — unknowingly, I would say, but perfectly — and despite the continual violations of the conventions of writing, the reader 'enters' without difficulty. All the elements of instruction, which is implicit and made explicit in the very disposition of the text, inextricably bind the reading to visual experience. The reading slips on, enters into, and emerges from the written elements without any awareness of a break in continuity between the perfectly integrated graphic and verbal dimensions of the text.

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<sup>3</sup> The facsimile was obtained through photostatic copies (recto/verso) of the manuscript pages included in the appendix of the first edition of *Giacomo Joyce* (New York: Viking Press, 1968). The reduced pages (from the third to the fourteenth) were returned to the dimensions of the four (the first and last two) which had already been reproduced at actual size (26 x 34 centimetres).

<sup>4</sup> The term 'laisse' — which has no reference whatsoever to the medieval poetic form — seemed to me appropriate to express the fluid, solitary, performed, exhaustive and at the same time 'quantic' character of the writing, and, by extension, of the empty space.

From a visual reading the readers *learn* that *GJ* is *discrete, discontinuous, nonlinear, irregular, mutable, dynamic*... They learn that its *dispositio* is far from being extraneous to its expression. The reading of the written *laises* will confirm that *GJ* is discrete, discontinuous, nonlinear, irregular, mutable, dynamic... They will emerge from a reading of *GJ* convinced that if it were not for the empty space rendering the text discrete, discontinuous, nonlinear, irregular, mutable, dynamic..., the text would no longer know how to be itself.

### Graphs: a means of exploration

My first try at clarifying the enigma of the sequence of writing and empty space was to make it evident — to epiphanise it, perhaps — through a complete graphic representation of *GJ*. I set out to place the entire structure of the text before a single gaze, to grasp it through a single act of perception from which might arise, by virtue of the very *integritas* of the vision, an act of *apperception*. Given that the ‘natural’ perception of the text could only take place through the diachronic turning of the pages, the ‘artificial’ perception, that is to say, a synchronic one of the entire structure, could only be attempted by recourse to a laboratory.

The first step was to establish criteria for the quantification and evaluation of the arrangement of the *laises* on the page. The decision was made to measure the distances separating parallel lines, marking the uppermost and lowermost extremes of each *laisse* of writing. The horizontal strips that were obtained from this delimited the areas of the page destined to writing or to blank space. The numeric width values — positive for the former, negative for the latter — quantified their presence, while the alternating order marked the distribution within the sequence.<sup>5</sup>

Using the numerical values resulting from the measurement of all the pages, I generated on a computer a considerable quantity of graphs of five main types: bar histograms, column graphs, line graphs, three-dimensional surface graphs, and radar graphs. Here I will examine only the bar histograms and radar graphs.

#### 1. Histograms

If the *mise-en-facsimile* coincided with the first *mise-en-graphie* of the manuscript, the first histogram, in appearing so tautologically similar to the page of which it was the graph, induced me to reconsider it as *the histogram of itself* (Fig. 1).

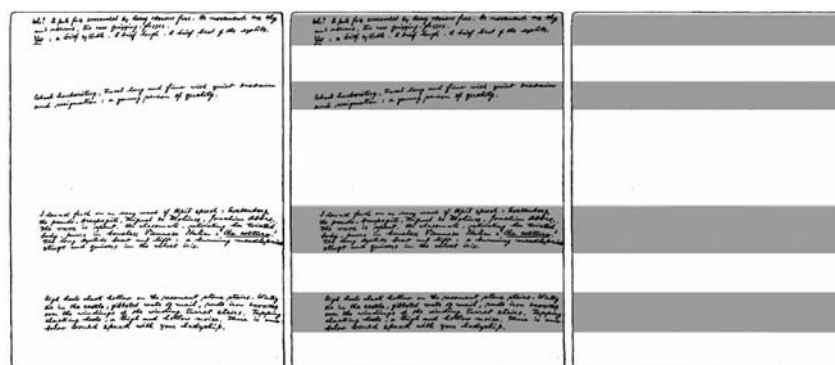


Fig. 1

At first sight, the histogram of the page did nothing but emphasise what the page itself already demonstrates: the alternating of grey and white strips — which correspond to the

<sup>5</sup> From the algebraic sum of all the area of writing and of space, it emerged that in 14 pages out of 16 — the exceptions being the 11th and the 15th — space was always preponderant over writing. The maximum amount of space was found to be in the 14th page, the maximum amount of writing (to an inversely proportional degree) in the 15th page. Taking the text globally, space occupies 60% of the entire ‘textual surface’, 20% more than the writing.

areas of writing and blank space — provides no information whatsoever that is not already carried by the written page. Yet it is precisely the erasure of the writing that in a certain sense allows one to *abstract* the gaze: viewed in a purely geometric dimension, the writing and the empty space assume homogenous values, becoming relatable and commensurable. Freed from a relation of figure/background, work/frame, writing and empty space appear as two different phases of the same (textual) system, two different dimensions of the same (literary) object.

In the process of geometric abstraction, which *puts* writing and empty space *onto the same level*, the writing evaporates and there is a crystallisation of the rhythm, the frequency, the pulse, the structural code, and the compositional matrix of the page. And an iconic, auto-graphic value emerges, implicit in the page itself: the page *is* already itself a histogram, that is to say, a mode of *representing the state* of the text in that area, in that point.

## 2. *Nacheinander/Nebeneinander*

From the set of 16 bar histograms I produced two graphs: *Nacheinander* and *Nebeneinander* (in homage to Stephen's celebrated stream of consciousness), which offer two 'hyperbolic arrangements' of the text, one related to time and the other to space.

In *Nacheinander* the 16 histograms are glued together "one after another", the end of one page with the beginning of the following one, the space at the end of a page with the space at the beginning of another. A long, irregular, string of white and grey bars in which the text is rendered as a unique, uninterrupted sequence of writing and empty space (a vertical *GJ* of 544 by 26 cm).

In *Nebeneinander* the 16 histograms are juxtaposed "one next to another", the pages side by side. An irregular tarsia of white and grey bars that highlight the compositional disparity of each page and in which the text is rendered as the co-presence of all the segments of empty space and writing within the horizon of a single page (a horizontal *GJ* of 416 by 34 cm).

Two single-page *GJ*'s, two *proteiform* experiments 'stephenly' conducted by closing the eye on one dimension to accentuate the other. The arrangement of the text along the horizontal or vertical axes of the page is an artefact that constrains it to display everything in sequence, in one direction and in another, to observe the two modalities.

The two graphs do not, then, refer to two *real* arrangements — it is impossible to project onto the same plane the opposite sides of the same sheet — but they are the *in vitro* manifestation of two dimensions of reading implied by the same *dispositio*, which is *the dispositio* of *GJ*. Though they do not have any realisation, indeed, precisely because they do not have any realisation, they are susceptible to functioning simultaneously as two complementary dimensions of a single textual system. Complementary dimensions that cross over both the units of measurement of the page — both in terms of time and of space — and within which the writing as well as the reading (not only visual) of *GJ* move, oscillating between the two.

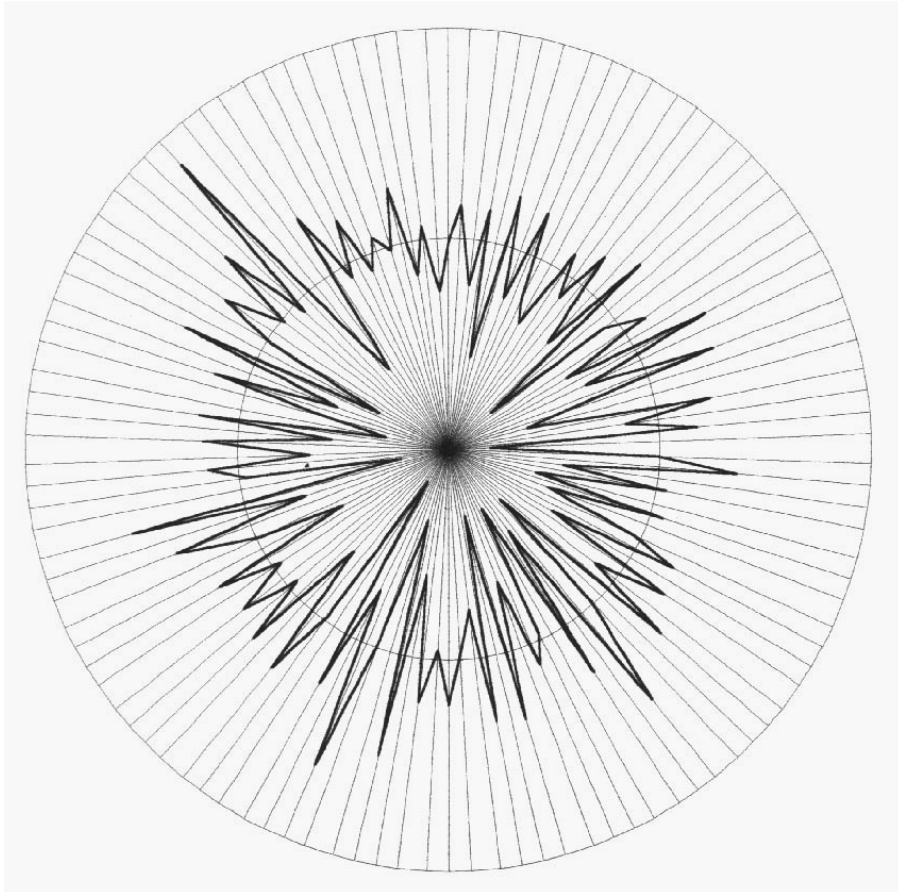
The writing too, will find itself, in the act of reading, to be linked in the same way: *laises* which are contiguous, *laises* in sequence, *laises* on the same page, *laises* that combine together beyond the boundaries of the sheet, *laises* that relate to each other quite apart from the contiguities, sequentialities, co-presences, the scansion of pages and of sheets. The relationships between successive *laises* of writing or those belonging to the same page are no more significant and have no stronger a relationship than those between *laises* that are distant from each other. If close proximity (by virtue of sequential positioning or by belonging to the same page) imposes a relation, great distances can be annulled by the free relations of resonances set in motion by the writing itself.<sup>6</sup>

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<sup>6</sup> It is interesting to note how on the single occasion in which Joyce refers to a precise temporal sequence of events (cf. the surgical operation described on the *recto* of the fifth sheet), is also the only one in which he arranges the writing in segments of the same width separated by equal extensions of empty space. To the three-syllable and equipartate scansion of the event (hospitalisation / operation/ convalescence) there corresponds the three-syllable and equipartate arrangement of the writing on the page.

### 3. Mandala

A word which sprang to mind as the radar graph formed on the computer screen (Fig. 2). *Mandala: a symbolic image founded on the geometric figures of the circle and of the square, which represent existing relationships between different planes of reality: a way of representing in geometric terms the relationships that exist between Writing and Void as planes (levels, phases, dimensions) of the same textual reality.*



A radar graph visualises value variations in relation to a central point. Any series of data produces a perimeter, an area, or a constellation (depending on the pre-chosen form of representation: line, surface or point dispersion) the centre of which is always the focal point of the radar. In the arrangement of the data relative to the sixteen pages of *GJ*, the centre of the radar corresponds to the maximum of space (the empty page), the external perimeter to the maximum of writing (the written page). If the pages of *GJ* had been entirely writing, the text would have been represented by a circle, if they had been totally non-writing, by a point. However, as each page is written on only *in a certain and ever-varying measure*, it is represented by a line which irregularly and dynamically oscillates between the extreme values of the circle and the point. A jagged yet still closed diagram due to leaps of greater or lesser width registered between the values of writing and empty space.

In *Mandala* the spatio-temporal dualism of *Nebeneinander* and *Nacheinander* resolves itself into a graph in which time and space are perfectly integrated. In the radar graph, the circular arrangement of data integrates and combines with their radial arrangement. The spatio-temporal alternating of empty space and writing is recodified as oscillations in size between centripetal forces (contracting towards the empty space) and centrifugal forces (expanding towards writing). Empty space and writing are in tension within the whole, unbroken

limits of a closed horizon: the fractional line lying between circle and point is the representation of their state of equilibrium — one of the many possible — of *GJ*.

The graphs re-represent the graphics *of the text*, remaining tied to the values within which the relations between writing and empty space are already expressed. To represent *GJ* graphically was a way, then, to re-represent to infinity the graphic structure of the text without ever entering into the writing, sticking exclusively to its visual dimension. A way of becoming familiar with, of trying out, and — why not? — taking pleasure in *GJ* by exploring and reinterpreting its graphic sense, just as a textual analysis generally does with the written words.

They were visual confirmation of the textual importance of the graphic dimension and they delineated at the same time the possibility of considering *GJ* as a *graphic representation* and as a *graph* of itself:<sup>7</sup> a way for the text to *represent* to itself and to *enact* in itself its own system.

### ***Fuzzy logic : a means of conceiving***

Contradicting the Aristotelean logical principle of non-contradiction, *fuzzy logic* (Kosko) describes ‘objects’ that can not be constrained within the limits of a bivalent logic (true/false, black/white, full/empty, \*/\*) because they are situated by their very nature in the vague, hazy, and indeterminate gradations of a scale of ‘greys’. A scale on which there is room for everything belonging to a *fractionary dimension* (of truth, whiteness, blackness, of that which is filled, of the void etc.) which can not be rounded up into a unit without betraying the nature of the object.<sup>8</sup>

I have previously defined the pages of *GJ* as written ‘in a certain and ever-varying measure’. From a graphic point of view, *GJ* is the result of the intersection between an empty set (the blank page) and a full one (the written page). Each page of *GJ* exhibits differing gradations of writing-emptiness; each page occupies, then, a different point along the scale of greys between the whiteness of empty space and the blackness of writing.

From a *fuzzy* point of view, therefore, the fact that *GJ* consists of parts which are empty and parts which are occupied by writing implies that its pages must be regarded as being *Written AND Not-written*: neither completely empty nor completely written, but lying between 0 (the completely blank page) and 1 (the completely written page):

$$P_{blank} < P_{GJ} < P_{written}$$

From a logical point of view, the Aristotelean principles of non-contradiction and exclusion must be applied to the proposition *Written AND not-Written*: *A* cannot entail *not-A* if one denies that *A* can be simultaneously itself and its contrary. According to *fuzzy logic*, on the other hand, the proposition *A=not-A* is valid. It follows that *A* entails *not-A* and *not-A* entails *A*. And if we substitute the terms we have *Written = not-Written*, from which: *Writing implies Void, Void implies Writing*. We could conceive then of *GJ* as a textual universe in which what is *not* determines, to a certain degree, the nature of what *is*, and what *is*, *is*, to a certain degree, in virtue of what is not.

In this perspective too, it is necessary to place the empty space in opposition to and on the same plane as the writing, in order to take on *GJ* without ‘roundings off’ of any kind. Rounding off *GJ* would mean, in fact, eliding the empty space, considering it a textually ignorable entity, and taking the writing as *all of* the text: that which is written can be read, while empty space can not, and *GJ*, until proven otherwise, is a text.

### ***Neural networks : a means of describing***

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<sup>7</sup> I distinguish here between the architecture of a network of connections (cf. Neural Networks) and the simple graphic representation.

<sup>8</sup> From this point of view, one could speak of (and even calculate) a *fractal dimension* to *GJ*.

If one of the cardinal functions of the blank space is to render the text discrete and discontinuous, one of its primary effects is to put the diachronic arrangement and the synchronic relations of the textual material into *counterpoint*.

The discrete nature of the text ensures that the degree of connectivity of the units of writing increases according to their autonomy. The epiphanic nature of the units is a function of this system. Each unit can be read as a self-concluding manifestation (or micronarration) in itself, but — in the total absence of privileged or hierarchic relations (also of a proxemic nature) — susceptible to forming connections with every other one that shares, to a certain degree, or not at all, some of its traits. *GJ* is not the sum of its epiphanic microcompositions (a simple system) but an inextricable network of hazy relations between nodes which are in dynamic equilibrium (a complex system). No trait, no node, maintains a constant value, not even the empty space.

Only an instrument capable of recognising the complex map of connections between all the units of empty space and of writing would be able to *describe GJ*. And I believe the only instruments of any use for the *realisation* of this type of investigation are Artificial Neural Networks (ANNs) — because they are the only ones that can *conceive* it.

ANNs are not closed programs which have been given a more or less detailed number of rules, but are open, ‘empty’ systems, capable of *learning* their own rules, starting from a collection of real data provided as input. These systems can learn, connecting models of input with models of output which have been identified as targets (Hetero-Associated networks) or, alternatively, they can autonomously identify their own targets, relating models of real input to themselves (Auto-Associated or Autopoietic networks), creating, in other words, their own representations of real models (Buscema).

In our specific case, the input models would count data relative to each unit of writing (graphic measurements and textual analysis) — and of empty space (graphic measurements). The network database would count variables relating to both present and absent traits, both on each unit of writing and of space. The units of space would be characterised by the presence of ‘graphic’ traits and the absence of all ‘linguistic’ traits to be found in the units of writing. The written and unwritten spaces of the text would thus become relatable and commensurable on the basis of the partial or total presence/absence of common traits. We could limit our investigation to the relations between elements belonging only to the units of writing or those of space, or extend them to cover both classes. We could evaluate, for example, units of writing and units of space in relation to their width and position, or consider the weight of a *hapax* bound by a variable number of options and traits, or, alternatively, evaluate a trait drawn from one or more unit of writing compared with one or more unit of space. At any rate, our investigations would be *exploring uncharted territory*, but would be at the same time profoundly grounded in the text because they are isomorphic to its functioning and conducted with an instrument shaped by the very learning itself of the work.

My ‘pre-neural’ investigation comes to rest here, on the threshold of hypothetical ‘neural’ investigations.<sup>9</sup> To go further would obviously involve verifying the hypotheses, beginning experimentation on ANNs, which I promise myself I will do. But now, on the basis of explorations thus far, I would like to launch over the threshold a number of hypotheses about the nature of *GJ*.

### **Chimera**

*GJ* is the genetic laboratory in which Joyce gave life to an intermedia creature: the literary *chimera* (in the sense of the mythical animal) which is *GJ* itself.

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<sup>9</sup> It was possible for me to formulate investigative hypothesis on neural networks thanks to the kind interest of *Semeion*, the Centro Ricerche di Scienza della Comunicazione (the Research Centre for Communication Science) in Rome, headed by Massimo Buscema.



In *Giacomo*, Joyce delivers to us a *discrete set* of micro-narrations which many critics are in agreement on in considering *epiphanic*. Some consider it to be little more than a collection of epiphanies. Giorgio Melchiori defines it, in a more organic fashion, as an *epiphanic narration* (Melchiori). I would prefer to call it — rather more ‘chimerally’ (in the cited sense) — an *epiphanic stream*. Indeed, I am convinced:

– that the writing of the laisses of *GJ* can be considered to be of an epiphanic nature, but as a result of its graphic arrangement, the text as a whole positions itself way beyond this nature and moves in dimensions that were to belong to the *stream of consciousness* and to the writing of *Ulysses*;

– that in *GJ* something *occurs at a graphic level* that in *Ulysses* and *Finnegans Wake* would occur exclusively at the level of writing.

The *stream of consciousness* — the spirit of which hovers over the whole of *GJ* — and the symptoms of a writing that would be that of *Ulysses* should not be sought out in the style of single units of writing, but in the overall system of the text. Segments of an epiphanic nature function as entities of a textual system that is no longer epiphanic, in which options are taken up that would belong to the *stream of consciousness* and to the writing that was yet to come. In *GJ* — for the first time in his work — Joyce performs what I would call a ‘*mise-en-scène of the writing*’:

– he eliminates the figure of the narrator and performs a *mise-en-page* of the writing itself; he substitutes the narration of something with the manifestation of the thing itself (a wider acceptance, possibly, of the notion of epiphany);

– he removes the readers from the position of external listener and instals them directly in the *authorial position* of his mind — as he would do for the streams of consciousness of Bloom, Molly and Stephen (this mutation too is not determined by substantive variations in the writing of single units, but by the overall system of the text); he leaves the readers, therefore, alone before the writing, compelling them to imagine and constantly update the flow of data, to base their knowledge on an initial state of unawareness and of equidistance from the data.

Joyce performs the experiment ‘on himself’: *GJ* is the first and only ‘stream of consciousness’ of Joyce, and Joyce, in addition to being the subject and the author, is not only the main reader but also the first one.

### ***The mind of Giacomo Joyce***

If consciousness can be considered the product of a set of mental events in cooperation/competition with each other, of which only the winners are destined to *form* consciousness (Dennett), every one of its direct expressions must be considered, strictly speaking, not as discourse which *surfaces in* the consciousness but one that *finds* it.

Joyce rejected an extremely costly textual system, one in which the narrator is burdened with all possible knowledge and expertise regarding characters and events, to test out a much more economic and powerful system, *one which is itself an instrument of consciousness and of thought*. In the absence of a narrating subject, thought, knowledge and the thinking and knowing mind itself ‘transubstantiate’, in *GJ*, in the *networks of relationships implied by the set of epiphanic segments*.

*GJ* is an instrument for thinking non-written thought; what is written permits thought, writing of the non-written of the non-writable, therefore — writing which — in the language of paradox — in not saying, says more, and says what it couldn’t have said by saying. A simple collection of epiphanies would have been entirely unable to bear the weight of a non-written, non-narrated, non-sayable consciousness and writing, and its inability would have been precisely attributable to the absence of empty space.

In *GJ* the author implements a textual system in balance between *epiphany* and *stream* (of consciousness), a system of writing suspended between two different dimensions of consciousness, a mental system whose moments of epiphanic consciousness refer as a whole to a further, uncreated epiphany of consciousness. A system in which something (consciousness, flux, the act of writing itself) *is* and at the same time is something else that *is not* yet: a *constellation* of epiphanies susceptible to becoming *stream*, a kind of *corpuscular / undulatory* state of consciousness.

Taken one by one, the fifty paragraphs of *GJ* are narrow shots of occurred consciousness; taken as a whole, a horizon of as yet inexistent consciousness. Within the space of this horizon is encribed the complex network of relations that make of a set of epiphanies an *epiphanic stream*. Each epiphanic node is an event of acquired consciousness, structured and translated into writing; the fabric of the connections, on the other hand, remains unacquired consciousness, *in fieri* writing, potential. Only an 'external' mind, which can actualise in the reading the processes of potential connection between the epiphanic nodes, is capable of producing such leaps of consciousness and of writing. This mind is, in the first instance, the mind of Joyce, which in laying out, as it lays out, its fifty epiphanic compositions, makes *GJ* the instrument of *its own* leap: a leap of *its own* consciousness, of *its own* writing.

Everything that has been outlined induces me to think of *GJ* as a text which, in producing sense, *behaves as a mind does*: a text which is body, nervous system, thought system and thought: the mind of James Joyce expanded in the mind of *Giacomo Joyce*.

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