

Mais proche de la croisée au nord vacante, un or
 Agonise selon peut-être le décor
 Des licornes ruant du feu contre une nixe,
 Elle, défunte nue en le miroir, encor
 Que, dans l'oubli fermé par le cadre, se fixe,
 De scintillations sitôt le septuor.⁸

Which gives

Onyx?
 Lampadophore . . .
 Phénix?
 Amphore . . .
 Nul Ptyx
 sonore
 au Styx
 s'honore
 Un or?
 le décor . . .
 Une Nixe
 encor
 se fixe:
 septuor

The *angoisse* is *lampadophore*, but also the *onyx*, just as the *amphore* also takes the shape of *Phénix*. Finally, one can guess, in this fashion, what the *septuor* may be; most exegetes have seen in it the seven stars of Ursa Major, but it may also be the seven rare rhymes of the sonnet.

Not every poem may be haikuized; that is, not all poems let themselves be treated—or mistreated—thus. Not every poem withstands such a treatment. The reason for this is simple, I believe: in Mallarmé, and particularly in Mallarmé's sonnets, each line is a little world, a unity whose meaning accumulates, as it were, in the rhyming section, whereas in Racine or Victor Hugo, still more in Molière or Lamartine, meaning runs through rhymes without stopping, so to speak, and one cannot cull it there. Even so, *Athalie's* dream can be haikuized:

Nuit
 montrée . . .
 Parée
 fierté . . .
 Emprunté

visage:
 outrage.
 Moi,
 toi:
 redoutables,
 épouvantables.
 Se baisser,
 embrasser,
 mélange
 fange:
 affreux. . . .⁹

One will notice that if haikuization is a restriction, the extension of the "haiku" is nothing other than a set rhyme.

2. The S + 7 Method

It consists in taking a text and replacing each substantive with the seventh following it in a given dictionary. The result obviously depends on the dictionary one chooses. Naturally, the number seven is arbitrary. Of course, if one takes, for example, a 2,000-word dictionary and uses the S + 2,000 Method, one ends up with the original text. One can also use the V (verb) + *n*, Adj. + *p*, etc. methods, and combine them; finally, *n*, *p* . . . are not necessarily constants.

A certain number of examples may be found in dossier 17 of the *Collège de Pataphysique*. The results are not always very interesting; sometimes, on the other hand, they are striking. It seems that only *good* texts give good results. The reasons for the qualitative relation between the original text and the terminal text are still rather mysterious, and the question remains open.

One will notice that if the inverse of haikuization is the set rhyme, the inverse of S + 7 is cryptography (or, at the least, a chapter of cryptography): given a text treated by this method, find the original.

3. Isomorphisms

Given a text, write another one using the same phonemes (isovocalism or isoconsonantism or, even better, isophonientism and isosymphonism) or the same grammatical pattern (isosyntaxism). One sees that the S + 7 Method is a numerical and lexicographical variant of isosyntaxism.

Here is an example of isovocalism:

Le liège, le titane et le sel aujourd'hui
 Vont-ils nous repiquer avec un bout d'aine ivre
 Ce mac pur oublié que tente sous le givre
 Le cancanant gravier des coqs qui n'ont pas fui

Un singe d'ocre loi me soutient que c'est lui
 Satirique qui sans versoir se délivre
 Pour n'avoir pas planté la lésion où vivre
 Quand du puéril pivert a retenti l'ennui

Tout ce porc tatouera cette grande agonie
 Par l'escale intimée au poireau qui le nie
 Mais non l'odeur du corps où le curare est pris

Grand pôle qu'à ce pieu son dur ébat assigne
 Il cintre, ô cytise, un bonze droit de mépris
 Que met parmi le style obnubilé le Cygne¹⁰

The original text is again taken from Mallarmé: as we can see, Mallarmé's sonnets are very high-grade material, like the fruit fly in genetics.

I conserved the last word of the poem in order to recall the original text, much like the early Cubists, who sometimes painted a nail in the corner of their canvas, for example, as a *trompe l'oeil*.

From isosyntaxism, we move naturally to what I have called (perhaps abusively) the matrical analysis of language. Here, we leave the work in pure potential literature behind in order to broach the borders of quantitative linguistics.

The formation of a sentence may be compared to the product of two matrices whose elements are words, the first (those of the matrix on the left) being all formers; the others (those of the matrix on the right) being all signifiers. Of course, I am supposing that the notions *sentence*, *former*, and *signifier* are well defined. By *sentence*, I mean that which is usually concluded with a punctuation mark, including at least a period. By *signifiers*, I mean substantives, adjectives, and verbs, and by *former*, all the other words, including the forms of the verbs *to be* and *to have*. The words in the French language are thus divided into two discrete sets. The product of two matrices of words gives thus a matrix composed of sentences, conforming to the classic rules of matrix multiplication.

Example:

$$\begin{vmatrix} \text{the} & \text{has} & \text{the} \\ \text{a} & \text{has} & \text{a} \\ \text{the} & \text{had} & \text{a} \end{vmatrix} \times \begin{vmatrix} \text{cat} & \text{rat} & \text{lion} \\ \text{eaten} & \text{devoured} & \text{degusted} \\ \text{fish} & \text{cheese} & \text{tourist} \end{vmatrix} =$$

$$\begin{vmatrix} \text{the cat has eaten} & \text{the rat has devoured} & \text{the lion has degusted} \\ \text{the fish} & \text{the cheese} & \text{the tourist} \\ \text{a cat has eaten} & \text{a rat has devoured} & \text{a lion has degusted} \\ \text{a fish} & \text{a cheese} & \text{a tourist} \\ \text{the cat had eaten} & \text{the rat had devoured} & \text{the lion had degusted} \\ \text{a fish} & \text{a cheese} & \text{a tourist} \end{vmatrix}$$

For this to "work," the two matrices (on the left of the "equals" sign) must be associated, such that:

(1) In the left matrix:

(a) the elements of the first and third columns are articles or possessive pronouns in the masculine singular;

(b) the elements of the second column are forms of the verb *to have* in the third person singular.

(2) In the right matrix:

(a) the elements of the first and third line are masculine substantives in the singular, beginning with consonants:

(b) the elements of the second line are masculine singular past participles of transitive verbs.

To the elements of 1a may be added *ce*, *certain*, *maint*, *quelque*, etc. (*cet*, etc., being limited). On the other hand, the right matrix may be indefinitely prolonged toward the right by adding triads, conformant to rules 2a and 2b.

For simplicity's sake, let us restrict our consideration to the product of a matrix-line by a matrix-column:

$$\begin{vmatrix} \text{the} & \text{has} & \text{the} \end{vmatrix} \times \begin{vmatrix} \text{gastronomist} \\ \text{degusted} \\ \text{caviar} \end{vmatrix} = \begin{vmatrix} \text{the} \times \text{gastronomist} \\ + \text{has} \times \text{degusted} \\ + \text{the} \times \text{caviar} \end{vmatrix}$$

We see that this "works" only if formers and signifiers alternate regularly.

If our matrical calculation is to be applicable in every case, we must add to the set of formers (respectively, signifiers) a unity-element that we shall call 1f (respectively 1s), or, more simply, 1, when it will not lead to confusion.

Example:

$$\begin{vmatrix} \text{the} & 1 & \text{the} \end{vmatrix} \times \begin{vmatrix} \text{gastronomist} \\ \text{degusts} \\ \text{caviar} \end{vmatrix} = \begin{vmatrix} \text{the} \times \text{gastronomist} \\ + 1 \times \text{degusts} \\ + \text{the} \times \text{caviar} \end{vmatrix}$$

Following Le Lionnais's suggestion, we shall call the product of former \times signifier *bimot*; one or the other may be equal to one (but not both at the same time, in order to avoid redundancy in notation).

The addition of "unity-elements" allows us to postulate a theorem which is now trivial: *In any sentence, there are as many formers as signifiers.*

We shall call the result of a first abstraction, considering only the grammatical functions of each word in a sentence, a *g-diagram*. In a second abstraction (*diagram*), we shall consider only the number and the alternation of formers and signifiers.

The example above will be written (on a single line for more convenience):

$$\| X \ 1 \ X \| \quad \times \quad \| X \ X \ X \|$$

(Let us remark in passing the analogy of this writing and, on the one hand, the sentence structure of certain American languages like Chinook, all formers being placed in initial position, and, on the other hand, "Polish" notation in logic.)

For the diagram to be correct, *primo*, as I have said, the two unities must not correspond; *secundo*, and for the same reason, one must not have:

$$\| \dots\dots\dots x_n 1 \dots\dots\dots \| \quad \times \quad \| \dots\dots\dots 1 y_n + 1 \dots\dots\dots \|$$

These rules of good construction once having been accepted, the number of possible diagrams of n elements (equal to the index term $n + 2$ of Fibonacci's sequence)¹¹ or of n words (equal to 2 to the n th power) may be determined, as well as some simple formulas on constants and variations, and the different types of diagrams and their proportions. Then, these will be compared to concrete data from literary texts (or other sorts of texts), which will furnish us with possibly interesting stylistic indices, for they are not the products of the conscious will of an author, and depend undoubtedly on several hidden parameters.

I must limit myself to allusion to these different problems (likewise to that of determining whether a given sentence corresponds fully to a given diagram and . . . what is a sentence?). I will note, however, the "potential" character of linguistic criteria overlooked by a writer's clear conscience. After Flaubert, the latter will avoid repetition and unrhymed verse (in Latin, he would have searched for metrical clausulae), he will (or not) be attentive to the length of his sentences, the choice of his vocabulary; but he will not seek to disobey Estoup-Zipf's law¹² or to use such and such a diagram following such and such a percentage.

Until now, that is. Perhaps we shall change that. I shall end on a pedagogical conclusion: granted that there is no longer any hope of reviving the translation into Latin, this marvelous exercise which bridged the gap between the composition in French and the geometry problem, perhaps this function could be fulfilled by Oulipian work on potential literature.¹³

Jacques Bens

Queneau Oulipian

The little research group in experimental literature that formed in 1960 around François Le Lionnais and Raymond Queneau, under the ambiguous name of *Ouvroir de Littérature Potentielle*, has until now confined itself to a modest but essential technical role. Its first definitions, its first declarations of faith stated, for example:

There are two potential literatures: an analytic and a synthetic. Analytic lipo seeks possibilities existing in the work of certain authors unknownst to them. Synthetic lipo constitutes the principal mission of the Oulipo; it is a question of opening new possibilities previously unknown to authors (François Le Lionnais).

And Raymond Queneau stated explicitly, in order to remove all dubitation of an "artistic" nature:

The Oulipo is not a movement or a literary school. We place ourselves beyond aesthetic value, which does not mean that we despise it.

Everything had begun with the *Cent Millie Millions de poèmes*, which Raymond Queneau was in the process of composing. When this composition was finished, the work was hailed by the Oulipians as the first work of potential literature. It was just that, and doubly so.

Indeed, if the Oulipo, because of lack of time, has been able to define potential literature only through recourse to *technical* criteria, it is nonetheless true that the notion of "potentiality" brims over amply from the rather thin frame of these definitions. One can state, without for the moment any attempt to delve more deeply, that a potential work is a work which is not limited to its appearances, which contains secret riches, which willingly lends itself to exploration.

One sees, then, all that makes for the potentiality of the *Cent Mille Millions de poèmes*: it is not only the example, the archetype they constitute, but also the ninety-nine trillion nine hundred ninety-nine billion nine hundred ninety-nine thousand nine hundred ninety sonnets that are found, inexpressed but *in potential*, in the ten others.

9. Friedman, W. F., and Friedman, E. S. *The Shakespearian Ciphers examined*. Cambridge: Cambridge University Press, 1957.
10. Hocke, G. R. *Manierismus in der Literatur. Sprach-Alchimie und esoterische Kombinationskunst*. Hamburg: Rowohlt, 1959.
11. Lalanne, L. *Curiosités littéraires*. Paris: Paulin, 1845.
12. Lausberg, H. *Handbuch der literarische Rhetorik*. 2 vols. Munich: M. Hueber, 1960.
13. Liede, A. *Dichtung als Spiel. Studien zur Unsinnspoese an den Grenzen der Sprache*. 2 vols. Berlin: W. de Gruyter, 1963.
14. Nicéron, J. P. *Bibliothèque amusante*. Paris, 1753.
15. Peignot, G. *Amusements philologiques*. Dijon: Lagier, 1842.
16. Pierce, J. R. *Symboles, Signaux et Bruits*. Paris: Masson, 1965.
17. Queneau, R. *Bâtons, chiffres et lettres*. Paris: Gallimard, 1965.
18. Schulz-Besser, E. *Deutsche Dictungen ohne den Buchstaben R*. *Ztschr. f. Bücherfreund*. 1909–1910; n. f. I: 382–389.
19. Walsh, W. S. *Handy Book of Literary Curiosities*. London: W. W. Gibbings, 1893.

Jacques Bens, Claude Berge,
and Paul Braffort
.....

Recurrent Literature

I. The Concept of Recurrence in Literature¹

The word "recurrence" evokes a movement of eternal return, of unlimited repetition. We would like, under the title "recurrent literature," to enlarge this theme through reference to the mathematical connotation that appears in notions like "demonstration through recurrence," "recursive functions," etc.

We will thus classify under the heading of "recurrent literature" any text that contains, explicitly or implicitly, generative rules that invite the reader (or the teller, or the singer) to pursue the production of the text to infinity (or until the exhaustion of interest or attention).

The definition we propose implies, for the recurrent text, the existence of a statement about generation, of an algorithm. This is what immediately places recurrent literature in the category of potential literature. But, of course, many anticipatory plagiarisms become apparent when one examines the various possible forms of this new literature.

All classification being obviously arbitrary in this case, we have adopted a system of incremental complexity, in the mathematical sense of the word. We shall thus examine successively:

- *repetitive* literature,
- *iterative* literature,
- *recursive* literature.

II. Repetitive Literature

This is the simplest form of recurrent literature, and for this reason it abounds in anticipatory plagiarisms. We shall distinguish two subclasses:

- *Explicit repetition* (or extensional repetition), which will necessarily be limited, in its written or oral presentation, to an initial finite segment.

A well-known anticipatory plagiarism is the song:

*Je demande à un joueur d'orgue
s'il connaît la Chaussée d'Antin, etc.*

This example puts an essential semantic constraint into play: the possibility of an unlimited cycle of requests for information and efforts of orientation on the part of the hero, who translates the topological possibility of circuits in an itinerary on a graph. One may easily foresee the possibilities of more difficult constraints which a more rigorous consideration of the properties of the graph in question would raise.

In another well-known plagiarism which is also a song:

*Lundi matin,
l'empereur,
sa femme et le petit prince . . .*

the repetitiveness is linked to the unlimited return of the days of the week, etc.

—*Implicit repetition* (or extensional repetition) poses delicate semantic problems.

The most elementary form is that of the story in which the first and last sentences are identical (innumerable anticipatory plagiarisms, the dearest to our heart being of course Raymond Queneau's *Le Chiendent*).

The elaborate form is that of the auto-encased, or "nested" story, which fantastic literature is so fond of (Jean Ray furnished a fine illustration of this in *Malpertuis*).

The constraint—eminently semantic—is the following: at the end of the story, the circumstances are such that all the parameters have regained the value they had in the beginning, and the reader is thus led to imagine that the story is about to begin again in identical fashion—most often, this happens in adventures during which the hero finds himself on the horns of the most horrible dilemmas.

Two versions are then possible. In the first, the repetition is apparent: the first version is a dream and the second (the last) is reality. The dream was premonitory and the reality in general leads to the hero's death.

The second version—the only one that concerns us—contradicts the Second Principle of Thermodynamics, because the "time" parameter cannot be reinitialized.

This permits us to illustrate here what one of us means by "theoretical literature" (by analogy to theoretical physics or chemistry). An utterance of theoretical literature might in fact be:

Theorem: Every nondegenerate, intentionally repetitive story necessarily develops in the fantastic genre.

Among the rarely explored avenues of intentionally repetitive literature, let us point out "cross-nested" stories: story A contains the evocation of story B, which itself contains the evocation of story A.

III. Iterative Literature

A purely repetitive story is a generator of texts producing—efficiently or not—an infinite series of identical texts.

If we replace the identity requirement with a weaker requirement of similitude (on the condition that the notion of similitude be beyond all question), we obtain a richer literature that we call "iterative."

Here again, popular songs furnish us with a wide choice of anticipatory plagiarisms:

*Alouette, gentille alouette . . .
J'ai le foie qu'est pas droit . . . , etc.*

In most instances, it is a case of enumerations that are too long to be exhaustive. The numerable infinity they sometimes evoke appears clearly with:

Y a qu'un cheveu sur la tête à Mathieu . . .

which uses moreover a process of iteration followed by a mirror.

Iteration can also imply a spiral, as in the theme of Schnitzler's *La Ronde*.

In fact, amorous passion (the propagation of venereal diseases) and the great Auger Showers of cosmic radiation evoke, for the mathematician, arborescent situations that already put recursive procedures and structures into play.

Many structures and constraints may be generalized by iteration. It is thus that the general Lescurian structure $C_i + N_i$,² where C_i denotes grammatical categories and N_i the whole numbers associated with them, may be generalized as

$$C_i + N_i + M_i$$

where M_i is the "step" associated with the category C_i .

For example, $\{ S + 7 + 1, V + 5 + 2 \}$ engenders, beginning from an initial text, a series of texts which is, in principle, unlimited, through replacing first the substantives (respectively, the verbs) with the substantives (respectively, the verbs) situated 7 (respectively, 5) steps further along in a dictionary chosen in advance. The second text will be engendered by taking 8 (respectively, 7) as the intersubstantive (respectively, interverb) distance, the third by taking 9 (respectively, 9), etc.

IV. Recursive Literature

As repetitive literature is a particular category of iterative literature (when the increment is null), so the latter is a particular category of recursive literature—so the “constant” and “following” functions are “elementary” recursive functions.

This is to say that the domain of the recursive, properly so called, is highly receptive to potentiality.

We shall confine ourselves here to presenting three examples with a view toward future meditations and suggestions.

The Lescurian with variable arithmetic

First, one chooses the syntactic category or categories that engender the lexical transference. The length of the transference is then determined with the help of a simple (recursive) arithmetical function of one or several parameters of the word to be transferred: number of syllables, length, etc.

Regarding constraints of this sort, one may pose interesting inverse problems: given two texts, a source and a target, let us determine a set of morphological parameters and (recursive) functions on these parameters permitting the passage from one text to the other, applying the corresponding Lescurian. It will be noted that the two texts must be homosyntactic.

Let us suppose, for instance, that one determined the set permitting the passage from Latis's to Duchateau's texts in the homosyntactic exercises of *Oulipo 1* (p. 176).³

It would be interesting to apply this particular Lescurian again to Duchateau's text (or to Queneau's, etc.).

This leads us to evoke another theme from theoretical literature (as one of us understands it) in the form of a problem:

Problem: What condition must be imposed on the choice of the parameters and the functions on these parameters, in a generalized Lescurian, in order for all the Lescurians that satisfy the condition to form a group? Is this group Abelian? (This problem is known, in the literature, as Braffort's Lescurian “Problem.”)

Cellular prosody

This is a system of constraints inspired by the English mathematician Conway's “the game of life,” a particularly simple and elegant variant of the notion of the cellular automaton developed by Von Neumann and Ulam.

The general idea is the following: one defines an “organism” by a configuration of points on a grid. Then, one specifies the metabolism of the organism with the help of a set of rules determining:

- the conditions for the death of an existing point;
- the conditions for the appearance of a point on a vacant node of the grid.

In the case of “the game of life,” a point *dies* of isolation if it has 0 or 1 neighbor, of suffocation if it has more than 3 neighbors. A point is *born* on a node of the grid if this node has exactly 3 neighbors occupied by points.

It may be demonstrated that certain organisms survive indefinitely, that others engender configurations which repeat themselves with a certain periodicity, etc.

One can easily imagine the possibilities offered by the application of an algorithm of this sort to prosody.

Indeed, let us consider a fixed form: a sonnet, an ode, a virelay, etc.: the words therein constitute a certain configuration that we shall consider as the initial organism. One may then imagine innumerable laws of evolution that cause words to appear and disappear in function of the relations they bear to their neighbors: alphabetical, lexical, syntactic, or semantic relations.

Two attitudes are then possible:

—“direct” research, where one postulates in advance the laws of metabolism and seeks to define a poem which, through the application of these laws, will give birth to an infinite series of poems possessing given properties;

—“inverse” research, where one postulates in advance a series of poems, and seeks laws of metabolism that permit the engendering (respecting or not the given order) of this series. For instance, one might pose the following (difficult) problem.

Problem: Find the metabolism which, when applied to the first poem of *La Légende des siècles*, engenders, in order, the other poems in this work.

Metapragmatic program literature

The division between the syntactic, semantic, and pragmatic aspects of language (traditional since Morris) is well known.

—Syntax is concerned with the relations that linguistic objects maintain among themselves.

—Semantics is concerned with the relations that linguistic objects maintain with the “exterior” universe they are supposed to represent.

—Pragmatics specifies the relations that linguistic objects maintain with the users of the language, the “locutors.”

The pragmatic aspect of semiotic studies is relatively impoverished. In literature, it appears only very episodically and allusively in texts of theater such as pragmatic dialogue:

CHARACTER—I'm leaving! *He leaves.*

Or, better:

CHARACTER—I'm leaving! *He does as he says.*

Anglo-Saxon analytic philosophy and contemporary linguists have identified, in the universe of discourse, a certain number of situations wherein the pragmatic aspect becomes preponderant. This is the case, in particular, of "illocutionary acts," where the utterance of a proposition is the affirmation itself, as in the sentence:

"I promise it to you"

which both states and is a promise.

The reader is probably already thinking of several possibilities of opening new domains for recurrent literature offered by the systematic explanation of the pragmatic aspect of natural language.

Let us thus imagine a text A which contains a rule for generating text B; we may represent this formally with the expression:

$$B \leftarrow \phi A$$

(text B is the result of the execution of instructions given by text A).

If the generative rules and text B have been properly chosen, text B may well be of the sort ϕC , and so forth.

One may imagine the power and depth of such an approach in reflecting on the behavior of the most elementary text constructed in this spirit, the text

$$A \leftarrow \phi 'A'$$

(text A is confined to the order: execute the text whose only name is "A"). For the algorithm expressed by this text obviously leads the author wishing to conform to it to impose upon himself an unlimited silent meditation.

It is thus preeminently the formula of all potential literature.

Claude Berge

.....

For a Potential Analysis of Combinatory Literature

When, at twenty years of age, Leibniz published his *Dissertatio de Arte Combinatoria*,¹ he claimed to have discovered a new branch of mathematics with ramifications in logic, history, ethics, and metaphysics. He treated all sorts of combinations therein: syllogisms, juridical forms, colors, sounds; and he announced two-by-two, three-by-three, etc., combinations, which he wrote: $com2natio$, $com3natio$, etc. . . .

In the field of plastic arts, the idea was not entirely new, since Breughel the Elder several years before had numbered the colors of his characters in order to determine their distribution by a roll of the dice; in the field of music, people were beginning to glimpse new possibilities, which were to inspire Mozart in his "Musical Game," a sort of card index that allows anyone to achieve the aleatory composition of waltzes, rondos, and minuets. But what about literature?

One has to wait until 1961 for the expression *combinatory literature* to be used, undoubtedly for the first time, by François Le Lionnais, in the postface to Raymond Queneau's *Cent Mille Millions de poèmes*. Literature is a known quantity, but combinatorics? Makers of dictionaries and encyclopedias manifest an extreme degree of cowardice when it comes to giving a definition of the latter; one can hardly blame their insipid imprecision, since traditional mathematicians who "feel" that problems are of combinatory nature very seldom are inclined to engage in systematic and independent study of the methods of resolving them.

In an attempt to furnish a more precise definition, we shall rely on the concept of *configuration*; one looks for a configuration each time one disposes a finite number of objects, and one wishes to dispose them according to certain constraints postulated in advance; Latin squares and finite geometries are configurations, but so is the arrangement of packages

of different sizes in a drawer that is too small, or the disposition of words or sentences given in advance (on the condition that the given constraints be sufficiently "crafty" for the problem to be real).² Just as arithmetic studies whole numbers (along with the traditional operations), as algebra studies operations in general, as analysis studies functions, as geometry studies forms that are rigid and topology those that are not, so combinatorics, for its part, studies configurations. It attempts to demonstrate the existence of configurations of a certain type. And if this existence is no longer open to doubt, it undertakes to count them (equalities or inequalities of counting), or to list them ("listing"), or to extract an "optimal" example from them (the problem of optimization).

It is thus not surprising to learn that a systematic study of these problems revealed a large number of new mathematical concepts, easily transposable into the realm of language, and that the pruritus of combinatorics has wrought its worst on the Oulipian breast.

Although the first complete literary work of frankly combinatorial nature is the *Cent Mille Millions de poèmes*, and although Raymond Queneau and François Le Lionnais are the cofounders of the Oulipo, created simultaneously, it should not be deduced that combinatorial literature is the Oulipo.

If one dissects Oulipian tendencies with a sharp enough scalpel, three currents become apparent: the first Oulipian vocation is undoubtedly "the search for new structures, which may be used by writers in any way they see fit," which means that we wish to replace traditional *constraints* like the "sonnet" with other linguistic constraints: alphabetical (Georges Perec's poems without e), phonetic (Noël Arnaud's heterosexual rhymes), syntactic (J. Queval's isosyntactic novels), numerical (J. Bens's irrational sonnets), even semantic.

The second Oulipian vocation, apparently unrelated to the first, is research into *methods of automatic transformation* of texts: for example, J. Lescure's S + 7 method.

Finally, the third vocation, the one that perhaps interests us most, is the *transposition* of concepts existing in different branches of mathematics into the realm of words: geometry (Le Lionnais's poems which are tangential among themselves), Boolean algebra (intersection of two novels by J. Duchateau), matrix algebra (R. Queneau's multiplication of texts), etc. . . .

It is within this last current that combinatorial literature is situated. Let us sharpen our scalpel a little bit more and cut up a few specimens.

The roughest form, the Stone Age of combinatorial literature, it must be noted, is *factorial poetry*, in which certain elements of the text may be

permuted in all possible ways as the reader (or chance) sees fit; the meaning changes, but syntactic correctness is preserved.

As early as the seventeenth century, Harsdörffer published in his *Récréations* factorial couplets like:

Ehr, Kunst, Geld, Guth, Lob, Weib und Kind
*Man hat, sucht, fehlt, hofft und verschwind*³

The ten words in *italics* may be permuted in all possible ways by the speaker without altering the rhythm (for they are all monosyllabic); whence 3,628,800 poems, different and grammatically correct (if one changes *sucht* to *Sucht*, *fehlt* to *Fehl*, *man* to *Mann*). With n words to permute, the number of possibilities would be " n factorial," that is, the number:

$$n! = 1 \times 2 \times \dots \times n$$

This form of poetry seems moreover to have been common during the period when it was called "Protean Poetry" (*Poetices Proteos*), following Julius Caesar Scaliger, who supposedly invented it. Leibniz, in his *Dissertatio*, cites numerous examples in monosyllabic Latin, from Bernhardus Bauhusius, Thomas Lansius, Johan Philippus Ebelius, Johan Baptistus Ricciolus, etc. . . .

And, as nothing is invented, we must wait until 1965 for Saporta to write and publish a "factorial" novel, whose pages, unbound, may be read in any order, according to the whim of the reader.⁴

Finally, in 1967, the Oulipo stated that it no longer expected any good to come from pure, unbridled chance, and Jacques Roubaud published his collection of poems, ϵ (Gallimard, 1967), wherein the author proposes the reading of the 361 texts that compose it in four different but well-determined orders.

Another more elaborate form of combinatorial poetry: Fibonacci poems. We call thus a text which has been split into elements (sentences, verses, words), and which one recites using only elements that were not juxtaposed in the original text.

This type of poetry is called Fibonacci because, with n elements, the number of poems one can engender is none other than "Fibonacci's Number":

$$F_n = 1 + \frac{n!}{1!(n-1)!} + \frac{(n-1)!}{2!(n-3)!} + \frac{(n-2)!}{3!(n-5)!} + \frac{(n-3)!}{4!(n-7)!} + \dots$$

Here is an example, whose origin is easily recognizable:

Feu filant,
 déjà sommeillant,

bénissez votre
 os
 je prendrai
 une vieille accroupie
 vivez les roses de la vie!⁵

Unfortunately, it is difficult to invent texts that lend themselves to such manipulations or rules for intervals that permit the conservation of literary quality.

In the *Cent Mille Millions de poèmes*, Raymond Queneau introduces ten sonnets, of fourteen verses each, in such a way that the reader may replace as he wishes each verse by one of the nine others that correspond to it. The reader himself may thus compose $10^{14} = 100,000,000,000,000$ different poems, all of which respect all the immutable rules of the sonnet. This type of poetry could be called "exponential," for the number of poems of n verses one can obtain with Queneau's method is given by the exponential function, 10^n . However, each of the hundred thousand billion poems may also be considered as a line drawn in a graph of the sort indicated in figure 1. According to this point of view, it should be noted that the reader advances in a graph *without circuits*; that is, he can never encounter the same verse twice in a reading respecting the direction of the arrows.

For this reason, in 1966 we proposed the dual form, the antipode: that is, poems on graphs *without cocircuits*. Without wishing to define a cocircuit here, let us say that these graphs are characterized by the property that, beginning from a given point, one can always end up at a point determined in advance.

Let us consider the simplified example of figure 2.

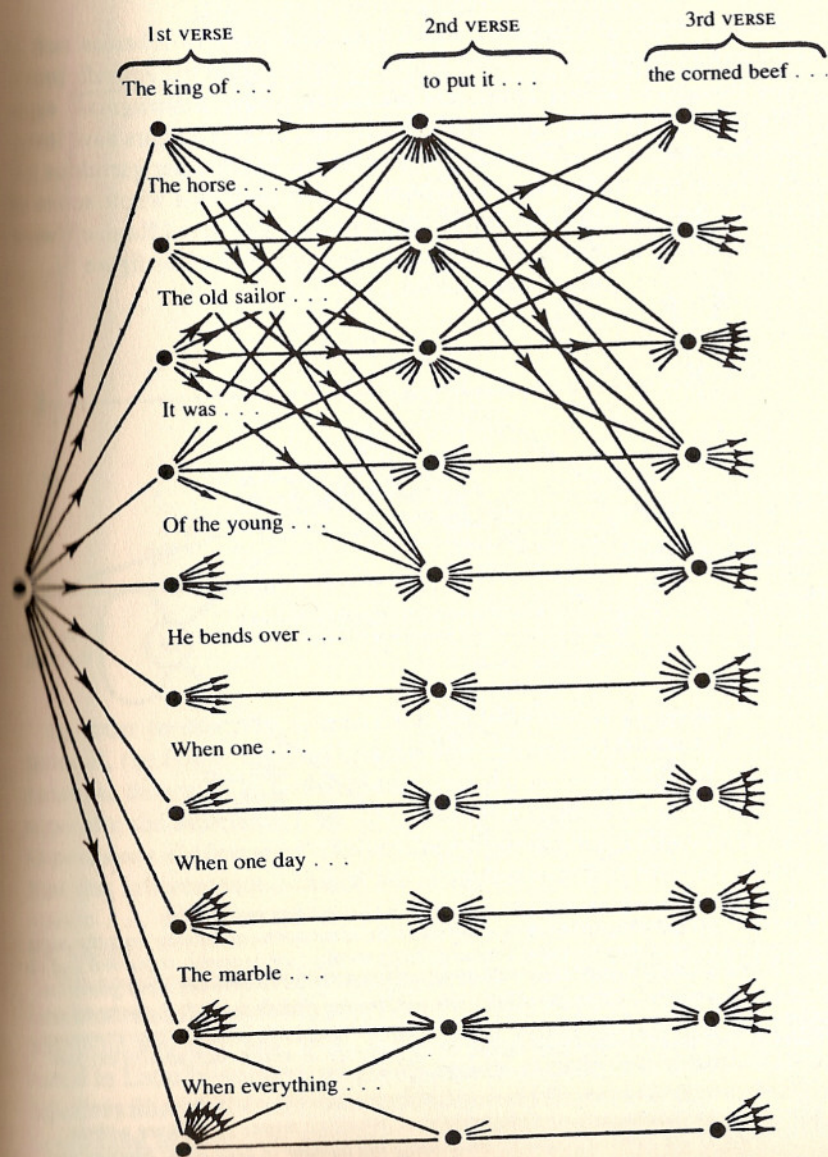
Other pathway procedures were proposed by Paul Braffort and François Le Lionnais at the 79th meeting of the Oulipo. This principle is also behind Raymond Queneau's "A Story as You Like It." This text, submitted at the Oulipo's 83rd working meeting, draws its inspiration from the instructions given to computers, the reader at each moment disposing of two continuations, according to whether the adventures of the "three alert peas" suit him or not. Presented in the form of a bifurcating graph (figure 3), imbrication of circuits becomes apparent, as do converging paths, etc. . . . whose properties might be analyzed in terms of the Theory of Graphs. [See figure 4 for additional Queneau graphs.]

Finally, it should be noted that in his *Drailles* (Gallimard, 1968), Jean Lescure travels pleasantly through a graph of order 4:

Feuille de rose porte d'ombre
 Ombre de feuille porte rose

Figure 1

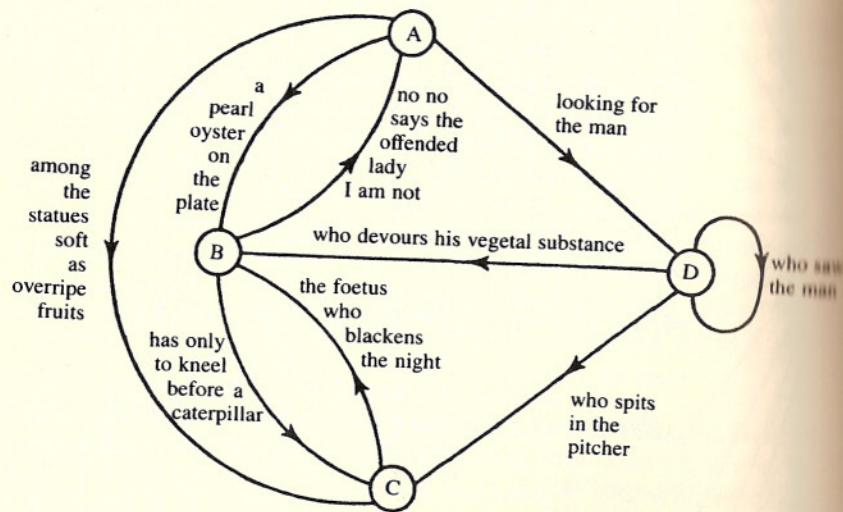
Principle of the graph of the *Cent Mille Millions de poèmes* (not all of the arcs and vertices have been drawn)



Feuille, porte l'ombre d'une rose
 Feuille rose à l'ombre d'une porte
 Toute rose ombre une porte de feuille
 . . .

Another form of literature, which may lend itself to schemas rich in combinatory properties, is what has come to be called the *episodic story*. Since Potocki's famous novel, *Un Manuscrit trouvé à Saragosse*, especially since the episodic novels of Eugène Sue, certain authors have imagined characters who relate adventures in which figure other garrulous heroes who in turn relate other adventures, which leads to a whole series of stories embedded one in the other. In his poems, Raymond Roussel⁶ went so far as to embed progressively six sets of parentheses [see figure 5].

Figure 2

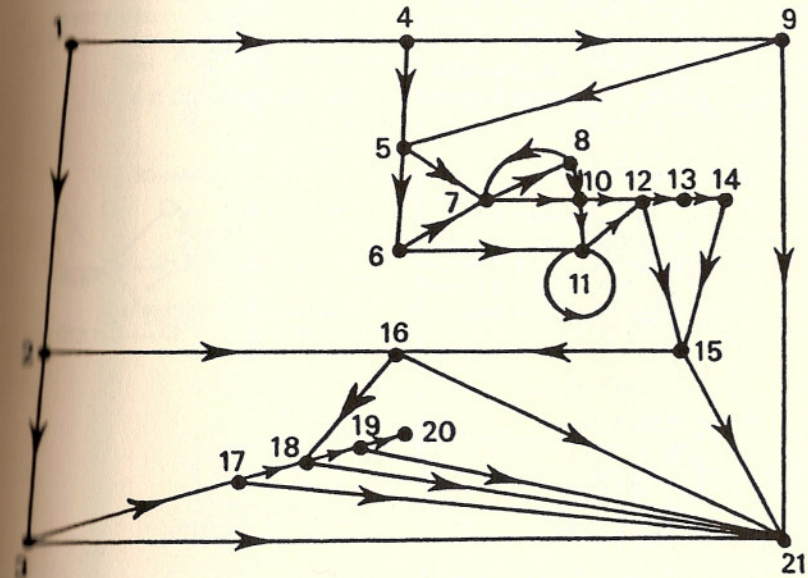


The verses corresponding to the arcs arriving at the same point (or leaving from the same point) were chosen in function of a very precise constraint; for example, those that end up at point D contain the word "man"; those leaving from point D have the same grammatical structure, etc. . . . Using this figure, the reader may choose a priori the point of departure and the point of arrival, and look for "the shortest path." He can also construct "Hamiltonian Poems," which correspond to an itinerary in which each point is encountered once and only once. Thus, the Hamiltonian Path BADC gives:

"No no says the offended lady I am not looking for the man who spits in the pitcher."
 One can even construct quasi-Eulerian poems, traveling through the figure without passing twice by the same arc, and in maximizing the number of arcs used; fundamental, purely mathematical concepts from the Theory of Graphs furnish thus so many constraints . . . and the number of texts that may be constructed using the same figure is infinite!

Figure 3

Bifurcating graph representing the structure of Raymond Queneau's "A Story as You Like It," *Lettres Nouvelles*, July-September 1967. (We owe this sagittal representation to Queneau)



In order to describe or count the agglomerations of parentheses in a monoid, the Polish logician Łukasiewicz established the bases of a mathematical theory; it is to this theory that we refer in figure 6, where we represent the structure of the first canto of Raymond Roussel's *Nouvelles Impressions d'Afrique* by a bifurcating arborescence. It may be remarked that this arborescence is much less complex than that of figure 7, for instance . . . which seems to open the door to a new field of research for the Oulipo.

We could not conclude this little inventory without mentioning bi-Latin literature and the work begun within the Oulipo by the author with Jacques Roubaud and Georges Perec. Since Euler, combinatorics has been interested in Latin bi-squares; a *Latin bi-square of order n* is a table of $n \times n$ squares, filled with n different letters and n different numbers, each square containing a letter and a number, each letter figuring only once in each line and each column, each number figuring only once in each line and each column.

Figure 4

Graphs of the Ternary Relation: X Takes Y for Z (paper delivered by Raymond Queneau at the 26 December 1965 meeting of the Oulipo)

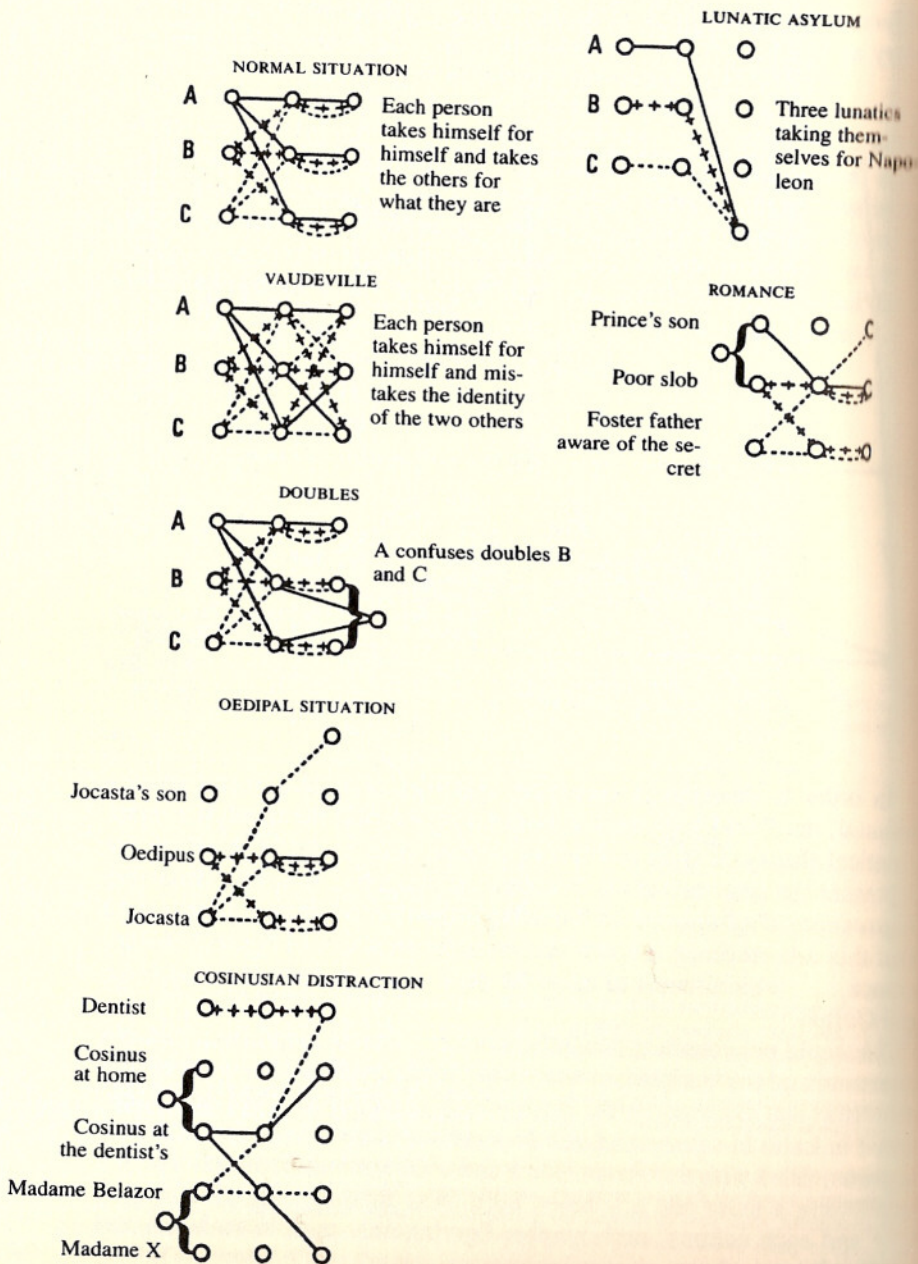


Figure 5

Tree representing the embedding of the parentheses in Raymond Roussel, Nouvelles Impressions d'Afrique, canto I (the encircled numbers represent the number of the verse wherein the parentheses are opened or closed)

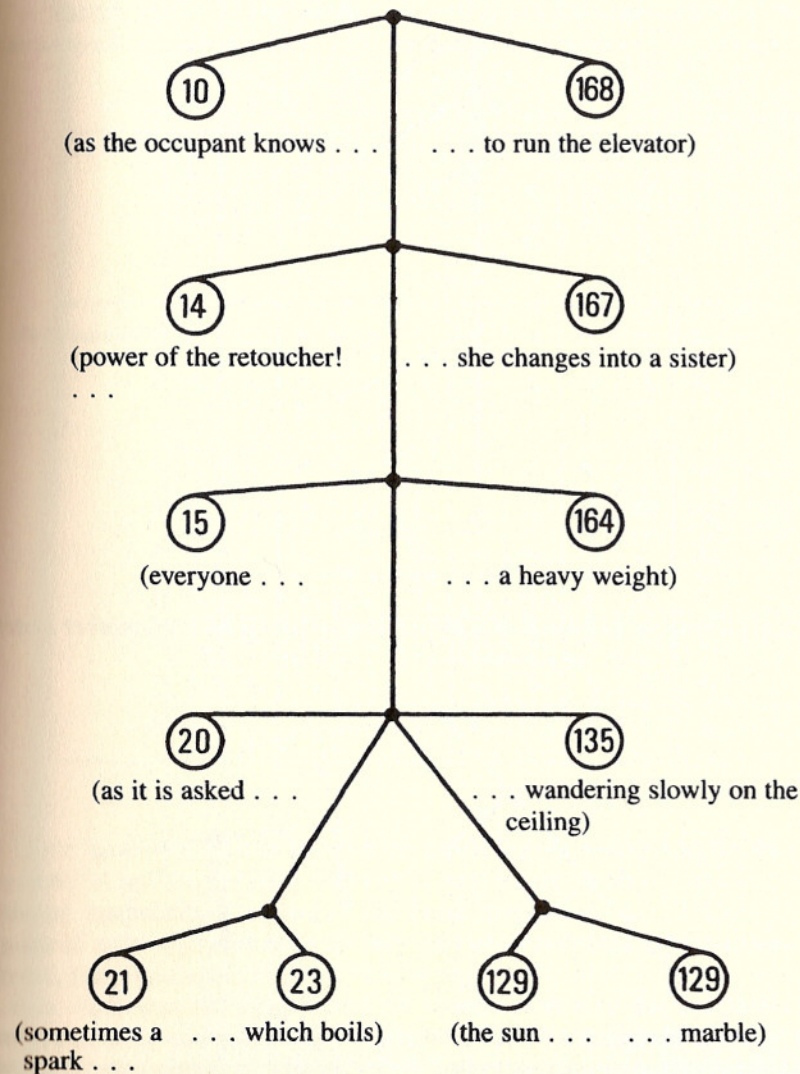


Figure 6

Representation by means of a bifurcating arborescence of the preceding system of parentheses

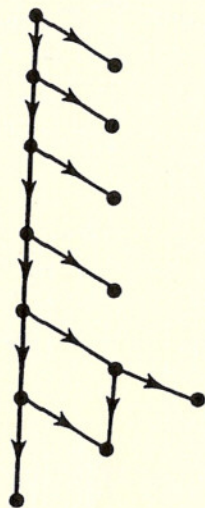
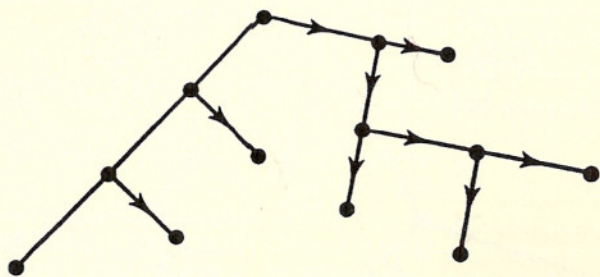


Figure 7

Representation by means of a bifurcating arborescence of another system of parentheses: [()] {()}



A Latin bi-square of order 10 is reproduced in figure 8; it is, moreover, an extremely rare specimen, and at the present time only two are known to exist. We thus proposed to write 10 stories (represented by the 10 lines of the table) wherein appear 10 characters (represented by the 10 columns of the table). Each character's attribute is determined by the letter of the corresponding square; his action is likewise determined by the number of the corresponding square.

Figure 8

Specimen of the Latin bi-square of order 10; the letters represent a characteristic attribute: A = violent lover, B = stupid as an ox, C = rascal; etc. . . . The numbers represent the dominant action of the character: 0 = does nothing, 1 = steals and assassinates, 2 = behaves in a strange and inexplicable way; etc. . . .

	Mr. Demaison	Paul	Mrs. Demaison	Count Bellerval	Archimedes	The goldfish	Destiny	Valerie	Don Diego	Mr. Member
Story number 1	A ₀	G ₇	F ₈	E ₉	J ₁	I ₈	H ₆	B ₂	C ₄	D ₀
2	H ₆	B ₁	A ₇	G ₈	F ₉	J ₂	I ₄	C ₃	D ₅	E ₀
3	I ₈	H ₀	C ₂	B ₇	A ₆	G ₉	J ₃	D ₄	E ₆	F ₁
4	J ₄	I ₆	H ₁	D ₃	C ₇	B ₉	A ₅	E ₅	F ₀	G ₂
5	B ₉	J ₅	I ₀	H ₂	E ₄	D ₇	C ₈	F ₆	G ₁	A ₃
6	D ₈	C ₉	J ₆	I ₁	H ₃	F ₉	E ₇	G ₀	A ₂	B ₄
7	F ₇	E ₈	D ₉	J ₀	I ₂	H ₄	G ₆	A ₁	B ₃	C ₅
8	C ₁	D ₂	E ₃	F ₄	G ₅	A ₆	B ₇	H ₈	I ₉	J ₀
9	E ₂	F ₃	G ₄	A ₅	B ₆	C ₇	D ₈	I ₉	J ₇	H ₆
10	G ₃	A ₄	B ₅	C ₆	D ₇	E ₈	F ₉	J ₈	H ₉	I ₇

These 10 stories contain thus all the possible combinations in the most economical fashion possible. Moreover, they are the result of a century of arduous mathematical research, for Euler conjectured that a Latin bi-square of order 10 could not exist, and we had to wait until 1960 for Bose, Parker, and Shrikhande to prove him wrong. . . .⁷

It is clear that the contribution of combinatorics to the domains of words, rhymes, and metaphors is more complex than it seems, and that it is far from the anagrams of the Rhétoriqueurs or the stammerings of the Protean poets.

He will be called upon to solve a series of enigmas, and the machine will furnish him with clues (inspired by the game of cork-penny) as to his groping progression in the text.

Type 3: Author→Computer→Reader→Computer→Work

With this third type we enter into the domain of projects that are more distant and more technically complex. In Marcel Bénabou's "artificial aphorisms," the author furnishes a stock of empty forms and a stock of words destined to fill them; the reader then comes along to formulate a request, and, following this request, the machine combines words and forms to produce aphorisms.⁸

The reader's participation is limited, but it nonetheless necessitates a few elementary flexions in the resultant text. In spite of everything, one may affirm that the author dominates his material in these aphorisms; this is not so in the case of the S.S.A.Y.L.I. (Short Story As You Like It) project.

The goal of this enterprise is to produce diversified short stories in very large quantities according to the precise and various wishes formulated by the reader (he may choose the length, the theme, the decor, the characters, and the style).

Beginning with a few homosyntactic short stories, Paul Braffort and Georges Kermidjian attempt to establish an extremely supple general os-
sature and a stock of "agms," minimal unities of action or description. Their exact description is in permanent evolution, but one may say, roughly, that they are the intermediary unities between the word and the sentence, which in theory ought to permit one to avoid both the pitfalls of grammar and the feeling of suffocation provoked by sentence types that recur incessantly (as in the work of Sheldon Kline). Each of these agms receives specific attributes which will come into play according to the reader's wishes.

The interest of this project is triple: first, it allows one to produce short stories, and this is nice when one likes producing short stories; second, it enables one to elaborate a particular grammar prudently, step by step; third, it allows one to constitute a stock of agms that may be used on other occasions. But it is a long-term project that is only beginning. It will take patience, work, and time (= money).⁹

Italo Calvino

.....

Prose and Anticombinatorics

The preceding examples concerned the use of the computer as an aid to literary creation in the following situations:

The structures chosen by the author are relatively few in number, but the possible realizations are combinatorily exponential.

Only the computer may realize a number (more or less large) of these potentialities.

On the contrary, the assistance of the computer takes on an *anticombinatory* character when, among a large number of possibilities, the computer selects those few realizations compatible with certain constraints.

Order in Crime

I have been working for some time on a short story (perhaps a novel?) which might begin thus:

The fire in the cursed house

In a few hours Skiller, the insurance agent, will come to ask for the computer's results, and I have still not introduced the information into the electronic circuits that will pulverize into innumerable impulses the secrets of the Widow Roessler and her shady *pension*. Where the house used to stand, one of those dunes in vacant lots between the shunting yards and the scrapyards that the periphery of our city leaves behind itself like so many little piles of trash forgotten by the broom, nothing now remains but scattered debris. It might have been a cute little villa beforehand, or just as well nothing other than a ghostly hovel: the reports of the insurance company do not say; now, it has burned from the cellar to the attic, and nothing was found on the charred cadavers of its four inhabitants that might enable one to reconstitute the antecedents of this solitary massacre.

A notebook tells more than these bodies, a notebook found in the ruins,

entirely burned except for the cover, which was protected by a sheet of plastic. On the front is written: *Accounts of horrible acts perpetrated in this house*, and on the back there is an index divided into twelve headings, in alphabetical order: To Bind and Gag, To Blackmail, To Drug, To Prostitute, To Push to Suicide, To Rape, To Seduce, To Slander, To Spy Upon, To Stab, To Strangle, To Threaten with a Revolver.

It is not known which of the inhabitants of the house wrote this sinister report, nor what was its intent: denunciation, confession, self-satisfaction, fascinated contemplation of evil? All that remains to us is this index, which gives the names neither of the people who were guilty nor those of the victims of the twelve actions—felonious or simply naughty—and it doesn't even give the order in which they were committed, which would help in reconstituting a story: the headings in alphabetical order refer to page numbers obscured by a black stroke. To complete the list, one would have to add still one more verb: To Set Ablaze, undoubtedly the final act of this dark affair—accomplished by whom? In order to hide or destroy what?

Even assuming that each of these twelve actions had been accomplished by only one person to the prejudice of only one person, reconstituting the events is a difficult task: if the characters in question are four in number, they may represent, taken two by two, twelve different relations for each of the twelve sorts of relations listed. The possible solutions, in consequence, are twelve to the twelfth power; that is, one must choose among solutions whose number is in the neighborhood of eight thousand eight hundred seventy-four billion two hundred ninety-six million six hundred sixty-two thousand two hundred fifty-six. It is not surprising that our overworked police preferred to shelve the dossier, their excellent reasoning being that however numerous were the crimes committed, the guilty died in any case with the victims.

Only the insurance company needs to know the truth, principally because of a fire insurance policy taken out by the owner of the house. The fact that the young Inigo died in the flames only renders the question that much thornier: his powerful family, who undoubtedly had disinherited and excluded this degenerate son, is notoriously disinclined to renounce anything to which it may have a claim. The worst conclusions (included or not in that abominable index) may be drawn about a young man who, hereditary member of the House of Lords, dragged an illustrious title over the park benches that serve a nomadic and contemplative youth as beds, and who washed his long hair in public fountains. The little house rented to the old landlady was the only heritage that remained to him, and he had been admitted into it as sublessee by his tenant, against a reduction of the already modest rent. If he, Inigo, had been both guilty incendiary and

victim of a criminal plot carried out with the imprecision and insouciance that apparently characterized his behavior, proof of fraud would relieve the company from payment of damages.

But that was not the only policy that the company was called upon to honor after the catastrophe: the Widow Roessler herself each year renewed a life insurance policy whose beneficiary was her adopted daughter, a fashion model familiar to anyone who leafs through the magazines devoted to *haute couture*. Now Ogiva too is dead, burned along with the collection of wigs that transformed her glacially charming face—how else to define a beautiful and delicate young woman with a totally bald head?—into hundreds of different and delightfully asymmetric characters. But it so happened that Ogiva had a three-year-old child, entrusted to relatives in South Africa, who would soon claim the insurance money, unless it were proved that it was she who had killed (*To Stab? To Strangle?*) the Widow Roessler. And since Ogiva had even thought to insure her wig collection, the child's guardians may also claim this indemnization, except if she were responsible for its destruction.

Of the fourth person who died in the fire, the giant Uzbek wrestler Belindo Kid, it is known that he had found not only a diligent landlady in the Widow Roessler (he was the only paying tenant in the *pension*) but also an astute impresario. In the last few months, the old woman had in fact decided to finance the seasonal tour of the ex-middleweight champion, hedging her bets with an insurance policy against the risk of contract default through illness, incapacity, or accident. Now a consortium of promoters of wrestling matches is claiming the damages covered by the insurance; but if the old lady *pushed him to suicide*, perhaps through *slandering* him, *blackmailing* him, or *drugging* him (the giant was known in international wrestling circles for his impressionable character), the company could easily silence them.

My hero intends to *solve the enigma*, and from this point of view the story belongs thus to the *detective mystery* genre.

But the situation is also characterized by an eminently combinatory aspect, which may be schematized as follows:

4 characters: A, B, C, D.

12 transitive, nonreflexive actions (see list below).

All the possibilities are open: one of the 4 characters may (for example) rape the 3 others or be raped by the 3 others.

One then begins to eliminate the impossible sequences. In order to do this, the 12 actions are divided into 4 classes, to wit:

appropriation of will	{	to incite
		to blackmail
		to drug

appropriation of a secret	{	to spy upon
		to brutally extort a confession from
		to abuse the confidence of
sexual appropriation	{	to seduce
		to buy sexual favors from
		to rape
murder	{	to strangle
		to stab in the back
		to induce to commit suicide

Objective Constraints

Compatibility between relations

For the actions of murder: If A strangles B, he no longer needs to stab him or to induce him to commit suicide.

It is also improbable that A and B kill each other.

One may then postulate that for the murderous actions the relation of two characters will be possible only once in each permutation, and it will not be reversible.

For sexual actions: If A succeeds in winning the sexual favors of B through seduction, he need not resort to money or to rape for the same object.

One may also exclude, or neglect, the reversibility of the sexual rapport (the same or another) between two characters.

One may then postulate that for the sexual acts, the relation of two characters will be possible only once in each permutation, and it will not be reversible.

For the appropriation of a secret: If A secures B's secret, this secret may be defined in another relation that follows in the sequence, between B and C, or C and B (or even C and D, or D and C), a sexual relation, or a relation of murder, or of the appropriation of will, or of the appropriation of another secret. After that, A no longer needs to obtain the same secret from B by another means (but he may obtain a different secret by a different means from B or from other characters). Reversibility of the acts of appropriation of a secret is possible, if there are on both sides two different secrets.

For the appropriation of will: If A imposes his will on B, this imposition may provoke a relation between A (or another) and B, or even between B and C (or A), a relation that may be sexual, murderous, the appropriation of a secret, the appropriation of another will. After that, A

no longer needs to impose the same will on B by another means (but he may, etc.).

Reversibility is possible, obviously, between two different wills.

Order of sequences

In each permutation, after an action of murder has taken place, the victim may no longer commit or submit to any other action.

Consequently, it is impossible for the three acts of murder to occur in the beginning of a permutation, because no characters would then be left to accomplish the other actions. Even two murders in the beginning would render the development of the sequence impossible. One murder in the beginning dictates permutations of 11 actions for 3 characters.

The optimal case is that in which the three acts of murder occur at the end.

The sequences given by the computer must be able to reveal chains of events held together by possible logical links. We have seen that the acts of will and of secret can imply others. In each permutation will be found privileged circuits, to wit:

the appropriation of a secret	{	of a sexual appro-	determines	an appropri-	{	a murder
		priation				tion of will
		of a murder		that deter-		appropriation
				mines		

or:

the appropriation of a will	leads to	{	a murder
			a sexual appropri-
			ation that deter-
			mines, etc.
			an appropriation of
			a secret

Each new relation in the chain excludes others.

Subjective Constraints

Incompatibility of each character with certain actions committed or submitted to. The 12 actions may also be divided according to a second sort of system, classifying them in 4 *subjective categories*.

<i>acts of physical strength</i>	<i>acts of persuasion</i>	<i>disloyal acts</i>	<i>acts that exploit another's weakness</i>
to extort	to incite	to abuse the confidence	to buy good graces
to rape	to seduce	to stab in the back	to blackmail
to strangle	to induce to commit suicide	to spy upon	to drug

—Of A it is known that he is a man of enormous physical strength, but that he is also an almost inarticulate brute.

A cannot submit to acts of physical strength.

A cannot commit acts of persuasion.

—Of B it is known that she is a woman in complete control of herself, with a strong will; she is sexually frigid; she hates drugs and drug addicts; she is rich enough to be interested only in herself.

B cannot submit to acts of persuasion.

B is not interested in acts that exploit another's weakness (she is not interested in buying sexual favors, she does not touch drugs, she has no motive for blackmail).

—Of C it is known that he is a very innocent Boy Scout, that he has a great sense of honor; if he takes drugs, he vomits immediately; his innocence protects him from all blackmail.

C cannot submit to acts that exploit another's weakness.

C cannot commit disloyal acts.

—Of D it is known that she is a terribly mistrustful woman and physically very weak.

D cannot submit to disloyal acts.

D cannot commit acts of strength.

An ulterior complication could be introduced!!!!

Each character could *change* in the course of the story (after certain actions committed or submitted to): each might lose certain incompatibilities and acquire others!!!!!!!!

For the moment, we forgo the exploration of this domain.

Esthetic Constraints (or subjective on the part of the programmer)

The programmer likes order and symmetry. Faced with the huge number of possibilities and with the chaos of human passions and worries, he

tends to favor those solutions that are the most harmonious and economical.

He proposes a model, such that:

—each action be perpetrated by one and only one character and have one and only one character as a victim;

—the 12 actions be equally distributed among the 4 characters; that is, each of them perpetrates 3 actions (one on each of the others) and is the victim of 3 actions (each perpetrated by one of the others);

—each of the 3 actions perpetrated by a character belongs to a different (objective) class of actions;

—the same as above for each of the three actions submitted to by any given character;

—between two characters there be no commutativity within the same class of actions (if A kills B, B cannot kill A; likewise, the three sexual relations will occur between differently assorted couples).

Is it possible at the same time to take account of the subjective constraints and of the so-called esthetic constraints?

This is where the computer comes in; this is where the notion of "computer-aided literature" is exemplified.

Let us consider, for instance, 4 characters whom we shall call:

ARNO
CLEM
DANI
BABY

A very simple program permits us to engender selections of 12 misdeeds. Each of these selections might be, in theory, the scenario our hero is trying to reconstitute.

Here are a few examples of such scenarios:

SELEC1

ARNO	BUYS	CLEM
CLEM	EXTORTS A CONFESSION FROM	ARNO
ARNO	CONSTRAINS	ARNO
ARNO	EXTORTS A CONFESSION FROM	BABY
CLEM	RAPES	DANI
ARNO	CUTS THE THROAT OF	DANI
DANI	CONSTRAINS	BABY
BABY	EXTORTS A CONFESSION FROM	ARNO
CLEM	POISONS	ARNO
DANI	EXTORTS A CONFESSION FROM	CLEM
ARNO	ABUSES	ARNO
CLEM	EXTORTS A CONFESSION FROM	CLEM

SELEC1

ARNO	POISONS	ARNO
DANI	SEDUCES	DANI
BABY	SPIES UPON	CLEM
BABY	RAPES	CLEM
BABY	EXTORTS A CONFESSION FROM	DANI
CLEM	SPIES UPON	ARNO
CLEM	THREATENS	CLEM
DANI	CONSTRAINS	BABY
DANI	EXTORTS A CONFESSION FROM	BABY
DANI	EXTORTS A CONFESSION FROM	ARNO
CLEM	ABUSES	BABY
BABY	BLACKMAILS	ARNO

SELEC1

DANI	SEDUCES	ARNO
BABY	CONSTRAINS	ARNO
ARNO	SPIES UPON	DANI
BABY	ABUSES	ARNO
CLEM	RAPES	CLEM
BABY	CUTS THE THROAT OF	DANI
ARNO	STRANGLES	ARNO
DANI	BUYS	ARNO
ARNO	ABUSES	ARNO
DANI	CUTS THE THROAT OF	CLEM
DANI	SEDUCES	CLEM
ARNO	CONSTRAINS	BABY

The absurdity of these scenarios is obvious. In fact, the program used is completely *stupid*: it permits a character to commit a misdeed against himself.

The program can be improved in imposing:

—that autocrimes be excluded;

—that each character figure only 3 times as criminal and 3 times as victim.

One then obtains scenarios like the following:

SELEC2

DANI	POISONS	ARNO
BABY	THREATENS	CLEM
BABY	SPIES UPON	ARNO
CLEM	BLACKMAILS	ARNO

CLEM	EXTORTS A CONFESSION FROM	BABY
DANI	SEDUCES	BABY
DANI	STRANGLES	CLEM
ARNO	RAPES	BABY
BABY	CUTS THE THROAT OF	DANI
ARNO	CONSTRAINS	CLEM
ARNO	ABUSES	DANI
CLEM	BUYS	DANI

SELEC2

ARNO	CONSTRAINS	CLEM
CLEM	BLACKMAILS	ARNO
DANI	BUYS	ARNO
ARNO	CUTS THE THROAT OF	BABY
ARNO	EXTORTS A CONFESSION FROM	DANI
BABY	RAPES	CLEM
CLEM	SEDUCES	BABY
DANI	THREATENS	CLEM
CLEM	ABUSES	DANI
BABY	STRANGLES	DANI
BABY	POISONS	ARNO
DANI	SPIES UPON	BABY

SELEC2

BABY	SPIES UPON	CLEM
ARNO	CUTS THE THROAT OF	DANI
DANI	STRANGLES	CLEM
DANI	THREATENS	ARNO
BABY	BLACKMAILS	ARNO
DANI	BUYS	BABY
CLEM	EXTORTS A CONFESSION FROM	BABY
BABY	RAPES	DANI
CLEM	CONSTRAINS	DANI
ARNO	ABUSES	BABY
ARNO	SEDUCES	CLEM
CLEM	POISONS	ARNO

This new program still comprises obvious insufficiencies.

Thus, in the first scenario it is not possible for Clem to blackmail Arno who has already been poisoned by Dani. In the second scenario, Baby cannot rape Clem, because Arno has already cut the latter's throat, etc.

Paul Braffort, who ensures the development in computer science nec-

essary to the progress of our work, has also written a series of programs for selections that progressively account for the *constraints* our story must respect in order to remain "logically" and "psychologically" acceptable.

This clearly demonstrates, we believe, that the aid of a computer, far from *replacing* the creative act of the artist, permits the latter rather to liberate himself from the slavery of a combinatory search, allowing him also the best chance of concentrating on this "clinamen" which, alone, can make of the text a true work of art.

Raymond Queneau

.....

The Relation X Takes Y for Z

I

As Paul Braffort remarked during the meeting of 14 January 1966, the ternary relation "X takes Y for Z" may be represented by a multiplication: $XY = Z$. The "graphs" of 26 December 1965 (see Claude Berge, "For a Potential Analysis of Combinatory Literature") will be replaced by multiplication tables (see II for the difficult cases).

Examples:

Normal Situation

	a	b	c
a	a	b	c
b	a	b	c
c	a	b	c

Vaudeville Situation

	a	b	c
a	a	c	b
b	c	b	a
c	b	a	c

Amphitryon

	J	M	Am	S	Al
Jupiter	J	M	Am	S	Al
Mercury	J	M	Am	S	Al
Amphitryon	J	M	Am	S	Al
Sosia	Am	S	Am	S	Al
Alcmene	Am	S	Am	S	Al

Raymond Queneau

A Story as You Like It

This text, submitted at the 83rd meeting of the Ouvroir de Littérature Potentielle, was inspired by the presentation of the instructions given to computers, and by programmed teaching. It is a structure analogous to the "tree" literature proposed by François Le Lionnais at the 79th meeting.

1. Do you wish to hear the story of the three alert peas?
 if yes, go to 4
 if no, go to 2
2. Would you prefer the story of the three big skinny beanpoles?
 if yes, go to 16
 if no, go to 3
3. Would you prefer the story of the three middling mediocre bushes?
 if yes, go to 17
 if no, go to 21
4. Once upon a time there were three peas dressed in green who were fast asleep in their pod. Their round faces breathed through the holes in their nostrils, and one could hear their soft and harmonious snoring.
 if you prefer another description, go to 9
 if this description suits you, go to 5
5. They were not dreaming. In fact, these little creatures never dream.
 if you prefer that they dream, go to 6
 if not, go to 7
6. They were dreaming. In fact, these little creatures always dream and their nights secrete charming dreams.
 if you wish to know these dreams, go to 11
 if you don't care about it, go to 7
7. Their cute little feet were covered in warm stockings and in bed they wore black velvet gloves.

- if you prefer gloves of another color, go to 8
 if this color suits you, go to 10
8. In bed, they wore blue velvet gloves.
 if you prefer gloves of another color, go to 7
 if this color suits you, go to 10
 9. Once upon a time there were three peas rolling along on the great highway. When evening came, they fell fast asleep, tired and worn.
 if you wish to know the rest, go to 5
 if not, go to 21
 10. All three were dreaming the same dream; indeed, they loved each other tenderly and, like proud mirrors, always dreamed similarly.
 if you wish to know their dream, go to 11
 if not, go to 12
 11. They dreamed that they were getting their soup at the soup kitchen, and that upon uncovering their bowl they discovered that it was ers soup. Horrified, they woke up.
 if you wish to know why they woke up horrified, consult the word "ers" in Webster, and let us hear no more of it
 if you judge it a waste of time to investigate this question further, go to 12
 12. Opopoi! they cried when they opened their eyes. Opopoi! what a dream we dreamed! A bad omen, said the first. Yessir, said the second, that's a fact, and now I'm sad. Don't worry like that, said the third, who was the sharpest of the three. We must comprehend rather than despair; in short, I will analyze it for you.
 if you wish to know the interpretation of this dream right away, go to 15
 if you wish on the contrary to know the reactions of the other two, go to 13
 13. You bore us to tears, said the first. Since when do you know how to analyze dreams? Yes, since when? added the second.
 if you too wish to know since when, go to 14
 if not, go to 14 anyway, because in any case you won't learn a thing
 14. Since when? cried the third. How should I know? The fact is that I practice analysis. You'll see.
 if you too wish to see, go to 15
 if not, go to 15 also, for you will see nothing
 15. Well then, let's see! cried his brothers. Your irony doesn't please me a bit, replied the other, and you'll not learn a thing. Moreover, during this rather sharp conversation, hasn't your sense of horror been blurred, or even erased? What use then to stir up the mire of your papilionaceous unconscious? Let's rather go wash ourselves in the fountain and greet this

gay morning in hygiene and saintly euphoria! No sooner said than done they slip out of their pod, let themselves roll gently to the ground, and trot joyously to the theater of their ablutions.

if you wish to know what happens at the theater of their ablutions, go to 16

if you do not wish to know, go to 21

16. Three big beanpoles were watching them.

if the three big beanpoles displease you, go to 21

if they suit you, go to 18

17. Three middling mediocre bushes were watching them.

if the three middling mediocre bushes displease you, go to 21

if they suit you, go to 18

18. Seeing themselves voyeurized in this fashion, the three alert peas, who were very modest, fled.

if you wish to know what they did after that, go to 19

if you do not wish to know, go to 21

19. They ran very hard back to their pod and, closing the latter after them, went back to sleep.

if you wish to know the rest, go to 20

if you do not wish to know, go to 21

20. There is no rest and the story is finished.

21. In this case, the story is likewise finished.

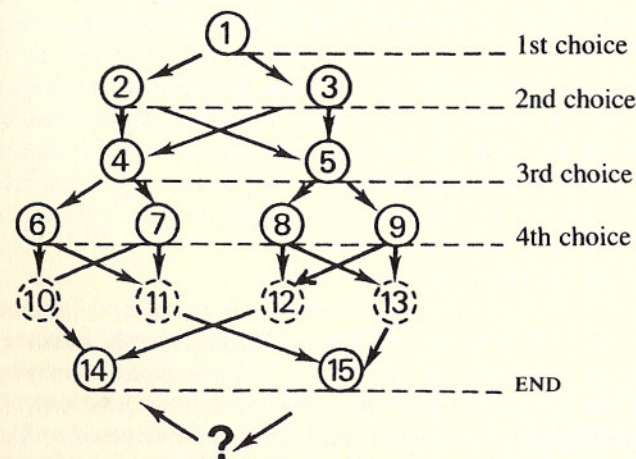
Paul Fournel

in collaboration with Jean-Pierre Énard

The Theater Tree: A Combinatory Play

Principle: At the outset, the objective was to produce a play using the structure of the tree. The problems encountered in a project of this sort are numerous, and some of them appeared practically insoluble. A "tree" play would, more particularly, demand an almost superhuman effort of memory on the part of the actors.

We thus elaborated a new graph which gives the audience all the appearances of the tree, but avoids the disadvantages for the actors:



Directions for use: The actors play the first scene, then invite the audience to determine that which follows, in choosing between two possible scenes (II and III). The modalities of this choice should be determined in

OULIPO

A PRIMER OF POTENTIAL LITERATURE

translated and edited by
WARREN MOTTE



Dalkey Archive Press
Champaign · London

Copyright © 1986 by the University of Nebraska Press
First Dalkey Archive edition, 1998
Second printing, 2007
All rights reserved

Library of Congress Cataloging-in-Publication Data:

Oulipo : a primer of potential literature / edited and translated by
Warren F. Motte, Jr. — 1st Dalkey Archive ed.
p. cm.

Originally published: Lincoln : University of Nebraska
Press, c1986.

Includes bibliographical references and index.

ISBN 1-56478-187-9 (alk. paper)

1. Oulipo (Association) 2. French literature—20th
century—History and criticism. 3. Literature—Societies, etc.—
France. 4. Literature and science—France. 5. Literary form.

I. Motte, Warren F.

PQ22.0809 1998

840'.6'044—dc21 97-51428

CIP

Partially funded by grants from the Services du Conseiller Culturel
and the Illinois Arts Council, a state agency, and by
the University of Illinois, Urbana-Champaign



www.dalkeyarchive.com

Printed on permanent/durable acid-free paper
and bound in the United States of America

For Marie, Nicholas, and Nathaniel