

la découverte alors voilà qui traumatisé
on espère toujours être de vrais normaux

Et pourtant c'était lui le frère de feintise

qui clochard devenant jetait ses oripeaux

frère même bas est la part indecise

que les parents féconds offrent aux purs berceaux

Le généalogiste observe leur bouillotte

griller le parchemin deviendra sa marotte

Il voudra retrouver le germe adulterin

Frère je te comprends si parfois tu débloques

frère je t'absoudrai si tu m'emberlucoques

SOURCES

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- (B) OULIPO: A PRIMER OF POTENTIAL LITERATURE, edited by Warren F. Motte, Jr.
- (C) THE HUMAN COUNTRY, by Harry Mathews
- (D) OULIPO LABORATORY, translators Mathew, White & Motte
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Cybernetics and Ghosts

Lecture delivered in Turin and other Italian cities,
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I

It all began with the first storyteller of the tribe. Men were already exchanging articulate sounds, referring to the practical needs of their daily lives. Dialogue was already in existence, and so were the rules that it was forced to follow. This was the life of the tribe, a very complex set of rules on which every action and every situation had to be based. The number of words was limited, and, faced with the multiform world and its countless things, men defended themselves by inventing a finite number of sounds combined in various ways. Modes of behavior, customs, and gestures too were what they were and none other, constantly re-

peated while harvesting coconuts or scavenging for wild roots, while hunting lions or buffalo, marrying in order to create new bonds of relationship outside the clan, or at the first moments of life, or at death. And the more limited were the choices of phrase or behavior, the more complex the rules of language or custom were forced to become in order to master an ever-increasing variety of situations. The extreme poverty of ideas about the world then available to man was matched by a detailed, all-embracing code of rules.

The storyteller began to play with words, not because he thought others might reply with other, predictable words, but to test the extent to which words could fit with one another, could give birth to one another, in order to extract an explanation of the world from the thread of every possible spoken narrative, and from the arabesque that nouns and verbs, subjects and predicates performed as they unfolded from one another. The figures available to the storyteller were very few: the jaguar, the coyote, the toucan, the piranha; or else father and son, brother-in-law and uncle, wife and mother and sister and mother-in-law. The actions these figures could perform were likewise rather limited: they could be born, die, copulate, sleep, fish, hunt, climb trees, dig burrows, eat and defecate, smoke vegetable fibers, make prohibitions, transgress them, steal or give away fruit or other things—things that were also classified in a limited catalogue. The storyteller explored the possibilities implied in his own language by combining and changing the permutations of the figures and the actions, and of the objects on which these actions could be brought to bear. What emerged were stories, straight-

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forward constructions that always contained correspondences or contraries—the sky and the earth, fire and water, animals that flew and those that dug burrows—and each term had its array of attributes and a repertoire of its own. The telling of stories allowed certain relationships among the various elements and not others, and things could happen in a certain order and not in others: prohibition had to come before transgression, punishment after transgression, the gift of magic objects before the trial of courage. The immobile world that surrounded tribal man, strewn with signs of the fleeting correspondences between words and things, came to life in the voice of the storyteller, spun out into the flow of a spoken narrative within which each word acquired new values and transmitted them to the ideas and images they defined. Every animal, every object, every relationship took on beneficial or malign powers that came to be called magical powers but should, rather, have been called narrative powers, potentialities contained in the word, in its ability to link itself to other words on the plane of discourse.

Primitive oral narrative, like the folk tale that has been handed down almost to the present day, is modeled on fixed structures, on, we might almost say, prefabricated elements—elements, however, that allow of an enormous number of combinations. Vladimir Propp, in the course of his studies of Russian folk tales, came to the conclusion that all such tales were like variants of a single tale, and could be broken down into a limited number of narrative functions. Forty years later Claude Lévi-Strauss, working on the myths of the Indians of Brazil, saw these as a system of logical operations be-

tween permutable terms, so that they could be studied according to the mathematical processes of combinatorial analysis.

Even if the folk imagination is therefore not boundless like the ocean, there is no reason to think of it as being like a water tank of small capacity. On an equal level of civilization, the operations of narrative, like those of mathematics, cannot differ all that much from one people to another, but what can be constructed on the basis of these elementary processes can present unlimited combinations, permutations, and transformations.

Is this true only of oral narrative traditions? Or can it be maintained of literature in all its variety of forms and complexities? As early as the 1920s, the Russian Formalists began to make modern stories and novels the object of their analysis, breaking down their complex structures into functional segments. In France today the semiological school of Roland Barthes, having sharpened its knives on the structures of advertising or of women's fashion magazines, is at last turning its attention to literature; the eighth issue of the magazine *Communications* was devoted to the structural analysis of the short story. Naturally enough, the material that lends itself best to this kind of treatment is still to be found in the various forms of popular fiction. If the Russians studied the Sherlock Holmes stories, today it is James Bond who provides the structuralists with their most apt exemplars.

But this is merely the first step in the grammar and syntax of narrative fiction. The combinatorial play of

narrative possibilities soon passes beyond the level of content to touch upon the relationship of the narrator to the material related and to the reader: and this brings us to the toughest set of problems facing contemporary fiction. It is no coincidence that the researches of the French structuralists go hand in hand (and sometimes coexist in the same person) with the creative work of the "Tel Quel" group. For the latter—and here I am paraphrasing statements by one of their authorized interpreters—writing consists no longer in narrating but in saying that one is narrating, and what one says becomes identified with the very act of saying. The psychological person is replaced by a linguistic or even a grammatical person, defined solely by his place in the discourse. These formal repercussions of a literature at the second or third degree, such as occurred in France with the *nouveau roman* of ten years ago, for which another of its exponents suggested the word "scripturalism," can be traced back to combinations of a certain number of logico-linguistic (or better, syntactical-rhetorical) operations, in such a way as to be reducible to formulas that are the more general as they become less complex.

I will not go into technical details on which I could only be an unauthorized and rather unreliable commentator. My intention here is merely to sum up the situation, to make connections between a number of books I have recently read, and to put these in the context of a few general reflections. In the particular way today's culture looks at the world, one tendency is emerging

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from several directions at once. The world in its various aspects is increasingly looked upon as *discrete* rather than *continuous*. I am using the term "discrete" in the sense it bears in mathematics, a discrete quantity being one made up of separate parts. Thought, which until the other day appeared to us as something fluid, evoking linear images such as a flowing river or an unwinding thread, or else gaseous images such as a kind of vaporous cloud—to the point where it was sometimes called "spirit" (in the sense of "breath")—we now tend to think of as a series of discontinuous states, of combinations of impulses acting on a finite (though enormous) number of sensory and motor organs. Electronic brains, even if they are still far from producing all the functions of the human brain, are nonetheless capable of providing us with a convincing theoretical model for the most complex processes of our memory, our mental associations, our imagination, our conscience. Shannon, Weiner, von Neumann, and Turing have radically altered our image of our mental processes. In the place of the ever-changing cloud that we carried in our heads until the other day, the condensing and dispersal of which we attempted to understand by describing impalpable psychological states and shadowy landscapes of the soul—in the place of all this we now feel the rapid passage of signals on the intricate circuits that connect the relays, the diodes, the transistors with which our skulls are crammed. Just as no chess player will ever live long enough to exhaust all the combinations of possible moves for the thirty-two pieces on the chessboard, so we know (given the fact that our minds are chessboards with

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hundreds of billions of pieces) that not even in a lifetime lasting as long as the universe would one ever manage to make all possible plays. But we also know that all these are implicit in the overall code of mental plays, according to the rules by which each of us, from one moment to the next, formulates his thoughts, swift or sluggish, cloudy or crystalline as they may be.

I might also say that what is finite and numerically calculable is superseding the indeterminateness of ideas that cannot be subjected to measurement and delimitation; but this formulation runs the risk of giving an oversimplified notion of how things stand. In fact, the very opposite is true: every analytical process, every division into parts, tends to provide an image of the world that is ever more complicated, just as Zeno of Elea, by refusing to accept space as continuous, ended up by separating Achilles from the tortoise by an infinite number of intermediate points. But mathematical complexity can be digested instantly by electronic brains. Their abacus of only two numerals permits them to make instantaneous calculations of a complexity unthinkable for human brains. They have only to count on two fingers to bring into play incredibly rapid matrices of astronomical sums. One of the most arduous intellectual efforts of the Middle Ages has only now become entirely real: I refer to the Catalan monk Raymond Lully and his *ars combinatoria*.

The process going on today is the triumph of discontinuity, divisibility, and combination over all that is flux, or a series of minute nuances following one upon the other. The nineteenth century, from Hegel to Dar-

win, saw the triumph of historical continuity and biological continuity as they healed all the fractures of dialectical antitheses and genetic mutations. Today this perspective is radically altered. In history we no longer follow the course of a spirit immanent in the events of the world, but the curves of statistical diagrams, and historical research is leaning more and more toward mathematics. And as for biology, Watson and Crick have shown us how the transmission of the characteristics of the species consists in the duplication of a certain number of spiral-shaped molecules formed from a certain number of acids and bases. In other words, the endless variety of living forms can be reduced to the combination of certain finite quantities. Here again, it is information theory that imposes its patterns. The processes that appeared most resistant to a formulation in terms of number, to a quantitative description, are not translated into mathematical patterns.

Born and raised on quite different terrain, structural linguistics tends to appear in terms of a play of contraries every bit as simple as information theory. And linguists, too, have begun to talk in terms of codes and messages, to attempt to establish the entropy of language on all levels, including that of literature.

Mankind is beginning to understand how to dismantle and reassemble the most complex and unpredictable of all its machines: language. Today's world is far richer in words and concepts and signs than the world that surrounded primitive man, and the uses of the various levels of language are a great deal more complex. Using transformational mathematical patterns, the

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American school led by Chomsky is exploring the deep structure of language, lying at the roots of the logical processes that may constitute no longer a historical characteristic of man, but a biological one. And extreme simplification of logical formulas, on the other hand, is used by the French school of structural semantics headed by A. J. Greimas. This school analyzes the narrative quality of all discourse, which may be reduced to a ratio between what they call *actants*.

After a gap of almost thirty years, a "Neo-Formalist" school has been reborn in the Soviet Union, employing the results of cybernetic research and structural semiology for the analysis of literature. Headed by a mathematician, Kholmogorov, this school carries out studies of a highly academic scientific nature based on the calculation of probabilities and the quantity of information contained in poems.

A further encounter between mathematics and literature is taking place in France, under the banner of hoaxing and practical joking. This is the Ouvroir de Littérature Potentielle (Oulipo), founded by Raymond Queneau and a number of his mathematician friends. This almost clandestine group of ten people is an offshoot of the Collège de Pataphysique, the literary society founded in memory of Alfred Jarry as a kind of academy of intellectual scorn. Meanwhile, the researches of Oulipo into the mathematical structure of the sestina in the work of the Provençal troubadours and of Dante are no less austere than the studies of the Soviet cyberneticians. It should not be forgotten that Queneau is the author of a book called *Cent Mille Milliards de poèmes*,

which purports to be not so much a book as the rudimentary model of a machine for making sonnets, each one different from the last.

Having laid down these procedures and entrusted a computer with the task of carrying out these operations, will we have a machine capable of replacing the poet and the author? Just as we already have machines that can read, machines that perform a linguistic analysis of literary texts, machines that make translations and summaries, will we also have machines capable of conceiving and composing poems and novels?

The interesting thing is not so much the question whether this problem is soluble in practice—because in any case it would not be worth the trouble of constructing such a complicated machine—as the theoretical possibility of it, which would give rise to a series of unusual conjectures. And I am not now thinking of a machine capable merely of "assembly-line" literary production, which would already be mechanical in itself. I am thinking of a writing machine that would bring to the page all those things that we are accustomed to consider as the most jealously guarded attributes of our psychological life, of our daily experience, our unpredictable changes of mood and inner elations, despairs and moments of illumination. What are these if not so many linguistic "fields," for which we might well succeed in establishing the vocabulary, grammar, syntax, and properties of permutation?

What would be the style of a literary automaton? I believe that its true vocation would be for classicism.

The test of a poetic-electronic machine would be its ability to produce traditional works, poems with closed metrical forms, novels that follow all the rules. In this sense the use so far made of machines by the literary avant-garde is still too human. Especially in Italy, the machine used in these experiments is an instrument of chance, of the destructuralization of form, of protest against every habitual logical connection. I would therefore say that it is still an entirely lyrical instrument, serving a typical human need: the production of disorder. The true literature machine will be one that itself feels the need to produce disorder, as a reaction against its preceding production of order: a machine that will produce avant-garde work to free its circuits when they are choked by too long a production of classicism. In fact, given that developments in cybernetics lean toward machines capable of learning, of changing their own programs, of developing their own sensibilities and their own needs, nothing prevents us from foreseeing a literature machine that at a certain point feels unsatisfied with its own traditionalism and starts to propose new ways of writing, turning its own codes completely upside down. To gratify critics who look for similarities between things literary and things historical, sociological, or economic, the machine could correlate its own changes of style to the variations in certain statistical indices of production, or income, or military expenditure, or the distribution of decision-making powers. That indeed will be the literature that corresponds perfectly to a theoretical hypothesis: it will, at last, be *the literature*.

II

Now, some of you may wonder why I so gaily announce prospects that in most men of letters arouse tearful laments punctuated by cries of execration. The reason is that I have always known, more or less obscurely, that things stood this way, not the way they were commonly said to stand. Various aesthetic theories maintained that poetry was a matter of inspiration descending from I know not what lofty place, or welling up from I know not what great depths, or else pure intuition, or an otherwise not identified moment in the life of the spirit, or the Voice of the Times with which the Spirit of the World chooses to speak to the poet, or a reflection of social structures that by means of some unknown optical phenomenon is projected on the page, or a direct grasp on the psychology of the depths that enables us to ladle out images of the unconscious, both individual and collective; or at any rate something intuitive, immediate, authentic, and all-embracing that springs up who knows how, something equivalent and homologous to something else, and symbolic of it. But in these theories there always remained a void that no one knew how to fill, a zone of darkness between cause and effect: how does one arrive at the written page? By what route is the soul or history or society or the subconscious transformed into a series of black lines on a white page? Even the most outstanding theories of aesthetics were silent on this point. I felt like someone who, due to some misunderstanding, finds himself among people who are discussing business that is no business

of his. Literature as I knew it was a constant series of attempts to make one word stay put after another by following certain definite rules; or, more often, rules that were neither definite nor definable, but that might be extracted from a series of examples, or rules made up for the occasion—that is to say, derived from the rules followed by other writers. And in these operations the person "I," whether explicit or implicit, splits into a number of different figures: into an "I" who is writing and an "I" who is written, into an empirical "I" who looks over the shoulder of the "I" who is writing and into a mythical "I" who serves as a model for the "I" who is written. The "I" of the author is dissolved in the writing. The so-called personality of the writer exists within the very act of writing: it is the product and the instrument of the writing process. A writing machine that has been fed an instruction appropriate to the case could also devise an exact and unmistakable "personality" of an author, or else it could be adjusted in such a way as to evolve or change "personality" with each work it composes. Writers, as they have always been up to now, are already writing machines; or at least they are when things are going well. What Romantic terminology called genius or talent or inspiration or intuition is nothing other than finding the right road empirically, following one's nose, taking short cuts, whereas the machine would follow a systematic and conscientious route while being extremely rapid and multiple at the same time.

Once we have dismantled and reassembled the process of literary composition, the decisive moment of literary life will be that of reading. In this sense, even

though entrusted to machines, literature will continue to be a "place" of privilege within the human consciousness, a way of exercising the potentialities contained in the system of signs belonging to all societies at all times. The work will continue to be born, to be judged, to be destroyed or constantly renewed on contact with the eye of the reader. What will vanish is the figure of the author, that personage to whom we persist in attributing functions that do not belong to him, the author as an exhibitor of his own soul in the permanent Exhibition of Souls, the author as the exploiter of sensory and interpretive organs more receptive than the average. . . . The author: that anachronistic personage, the bearer of messages, the director of consciences, the giver of lectures to cultural bodies. The rite we are celebrating at this moment would be absurd if we were unable to give it the sense of a funeral service, seeing the author off to the Nether Regions and celebrating the constant resurrection of the work of literature; if we were unable to introduce into this meeting of ours something of the gaiety of those funeral feasts at which the ancients re-established their contact with living things.

And so the author vanishes—that spoiled child of ignorance—to give place to a more thoughtful person, a person who will know that the author is a machine, and will know how this machine works.

III

At this point I think I have done enough to explain why it is with a clear conscience and, without regrets that I state that my place could perfectly well be occupied

by a mechanical device. But I am sure that many of you will remain rather unconvinced by my explanation, finding that my attitude of oft-repeated abnegation, of renunciation of the writer's prerogatives out of the love of truth, must surely be wrong; and that under all this something else must be lurking. I already feel that you are searching for less flattering motives for my attitude. I have nothing against this sort of inquiry. Behind every idealistic position that we adopt we can find the nitty-gritty of practical interest, or, even more often, of some basic psychological motivation. Let us see what my psychological reaction is when I learn that writing is purely and simply a process of combination among given elements. Well, then, what I instinctively feel is a sense of relief, of security. The same sort of relief and sense of security that I feel every time I discover that a mess of vague and indeterminate lines turns out to be a precise geometric form; or every time I succeed in discerning a series of facts, and choices to be made out of a finite number of possibilities, in the otherwise shapeless avalanche of events. Faced with the vertigo of what is countless, unclassifiable, in a state of flux, I feel reassured by what is finite, "discrete," and reduced to a system. Why is this? Does my attitude contain a hidden element of fear of the unknown, of the wish to set limits to my world and crawl back into my shell? Thus my stance, which was intended to be provocative and even profane, allows of the suspicion that, on the contrary, it is dictated by some kind of intellectual agoraphobia; almost a form of exorcism to defend me from the whirlwinds that literature so constantly has to face.

Let us attempt a thesis contrary to the one I have

developed so far (this is always the best way to avoid getting trapped in the spiral of one's own thoughts). Did we say that literature is entirely involved with language, is merely the permutation of a restricted number of elements and functions? But is the tension in literature not continually striving to escape from this finite number? Does it not continually attempt to say something it cannot say, something that it does not know, and that no one could ever know? A thing cannot be known when the words and concepts used to say it and think it have not yet been used in that position, not yet arranged in that order, with that meaning. The struggle of literature is in fact a struggle to escape from the confines of language; it stretches out from the utmost limits of what can be said; what stirs literature is the call and attraction of what is not in the dictionary.

The storyteller of the tribe puts together phrases and images: the younger son gets lost in the forest, he sees a light in the distance, he walks and walks; the fable unwinds from sentence to sentence, and where is it leading? To the point at which something not yet said, something as yet only darkly felt by presentiment, suddenly appears and seizes us and tears us to pieces, like the fangs of a man-eating witch. Through the forest of fairy tale the vibrancy of myth passes like a shudder of wind.

Myth is the hidden part of every story, the buried part, the region that is still unexplored because there are as yet no words to enable us to get there. The narrator's voice in the daily tribal assemblies is not enough to relate the myth. One needs special times and places, exclusive meetings; the words alone are not enough, and we need a whole series of signs with many meanings, which is

to say a rite. Myth is nourished by silence as well as by words. A silent myth makes its presence felt in secular narrative and everyday words; it is a language vacuum that draws words up into its vortex and bestows a form on fable.

But what is a language vacuum if not a vestige of taboo, of a ban on mentioning something, on pronouncing certain names, of a prohibition either present or ancient? Literature follows paths that flank and cross the barriers of prohibition, that lead to saying what could not be said, to an invention that is always a reinvention of words and stories that have been banished from the individual or collective memory. Therefore myth acts on fable as a repetitive force, obliging it to go back on its tracks even when it has set off in directions that appear to lead somewhere completely different.

The unconscious is the ocean of the unsayable, of what has been expelled from the land of language, removed as a result of ancient prohibitions. The unconscious speaks—in dreams, in verbal slips, in sudden associations—with borrowed words, stolen symbols, linguistic contraband, until literature redeems these territories and annexes them to the language of the waking world.

The power of modern literature lies in its willingness to give a voice to what has remained unexpressed in the social or individual unconscious: this is the gauntlet it throws down time and again. The more enlightened our houses are, the more their walls ooze ghosts. Dreams of progress and reason are haunted by nightmares. Shakespeare warns us that the triumph of the Renaissance did not lay the ghosts of the medieval world who

appear on the ramparts at Dunsinane or Elsinore. At the height of the Enlightenment, Sade and the Gothic novel appear. At one stroke Edgar Allan Poe initiates the literature of aestheticism and the literature of the masses, naming and liberating the ghosts that Puritan America trails in its wake. Lautréamont explodes the syntax of the imagination, expanding the visionary world of the Gothic novel to the proportions of a Last Judgment. In automatic associations of words and images the Surrealists discover an objective rationale totally opposed to that of our intellectual logic. Is this the triumph of the irrational? Or is it the refusal to believe that the irrational exists, that anything in the world can be considered extraneous to the reason of things, even if something eludes the reasons determined by our historical condition, and also eludes limited and defensive so-called rationalism?

So here we are, carried off into an ideological landscape quite different from the one we thought we had decided to live in, there with the relays of diodes of electronic computers. But are we really all that far away?

IV

The relationship between combinatorial play and the unconscious in artistic activity lies at the heart of one of the most convincing aesthetic theories currently in circulation, a formula that draws upon both psychoanalysis and the practical experience of art and letters. We all know that in matters of literature and the arts Freud was a man of traditional tastes, and that in his

writings connected with aesthetics he did not give us any pointers worthy of his genius. It was a Freudian art historian, Ernst Kris, who first put forward Freud's study of word-play as the key to a possible aesthetics of psychoanalysis. Another gifted art historian, Ernst Gombrich, developed this notion in his essay on Freud and the psychology of art.

The pleasure of puns and feeble jokes is obtained by following the possibilities of permutation and transformation implicit in language. We start from the particular pleasure given by any combinatorial play, and at a certain point, out of the countless combinations of words with similar sounds, one becomes charged with special significance, causing laughter. What has happened is that the juxtaposition of concepts that we have stumbled across by chance unexpectedly unleashes a pre-conscious idea, an idea, that is, half buried in or erased from our consciousness, or maybe only held at arm's length or pushed aside, but powerful enough to appear in the consciousness if suggested not by any intention on our part, but by an objective process.

The processes of poetry and art, says Gombrich, are analogous to those of a play on words. It is the childish pleasure of the combinatorial game that leads the painter to try out arrangements of lines and colors, the poet to experiment with juxtapositions of words. At a certain moment things click into place, and one of the combinations obtained—through the combinatorial mechanism itself, independently of any search for meaning or effect on any other level—becomes charged with an unexpected meaning or unforeseen effect which the conscious mind would not have arrived at deliberately:

an unconscious meaning, in fact, or at least the premonition of an unconscious meaning.

So we see that the two routes followed by my argument have here come together. Literature is a combinatorial game that pursues the possibilities implicit in its own material, independent of the personality of the poet, but it is a game that at a certain point is invested with an unexpected meaning, a meaning that is not patent on the linguistic plane on which we were working but has slipped in from another level, activating something that on that second level is of great concern to the author or his society. The literature machine can perform all the permutations possible on a given material, but the poetic result will be the particular effect of one of these permutations on a man endowed with a consciousness and an unconscious, that is, an empirical and historical man. It will be the shock that occurs only if the writing machine is surrounded by the hidden ghosts of the individual and of his society.

To return to the storyteller of the tribe, he continues imperturbably to make his permutations of jaguars and toucans until the moment comes when one of his innocent little tales explodes into a terrible revelation: a myth, which must be recited in secret, and in a secret place.

V

I am aware that this conclusion of mine contradicts the most authoritative theories about the relationship between myth and fable.

Until now it has generally been said that the fable is a "profane" story, something that comes after myth, a corruption or vulgarization or secularization of it, or that fable and myth coexist and counterbalance each other as different functions of a single culture. The logic of my argument, however—until some more convincing new demonstration comes along to blow it sky-high—leads to the conclusion that the making of fables precedes the making of myths. Mythic significance is something one comes across only if one persists in playing around with narrative functions.

Myth tends to crystallize instantly, to fall into set patterns, to pass from the phase of myth-making into that of ritual, and hence out of the hands of the narrator into those of the tribal institutions responsible for the preservation and celebration of myths. The tribal system of signs is arranged in relation to myth; a certain number of signs become taboo, and the "secular" storyteller can make no direct use of them. He goes on circling around them, inventing new developments in composition, until in the course of this methodical and objective labor he suddenly gets another flash of enlightenment from the unconscious and the forbidden. And this forces the tribe to change its set of signs once more.

Within this general context, the function of literature varies according to the situation. For long periods of time literature appears to work in favor of consecration, the confirmation of values, the acceptance of authority. But at a certain moment, something in the mechanism is triggered, and literature gives birth to a movement in the opposite direction, refusing to see

things and say things the way they have been seen and said until now.

This is the main theme of a book called *Le due tensioni* (*The Two Tensions*), which comprises the previously unpublished notes of Elio Vittorini (Milan: Il Saggiatore, 1967). According to Vittorini, literature until now has been too much the "accomplice of nature," that is, of the mistaken notion of an immutable nature; a Mother Nature, whereas its true value emerges only when it becomes a critic of the world and our way of looking at the world. In one chapter that may well state his definitive position, Vittorini seems to be starting from scratch on a study of the place of literature in human history. As soon as writing and books are born, he says, the human race is divided into a civilized part—the part of the race that long ago took the step into the Neolithic Age—and another part (called savage) that got stuck in the Paleolithic, and in which the Neolithics could not even recognize their ancestors: a part of humanity that thinks that things have always been the way they are, just as they think that masters and servants have always existed. Written literature is born already laden with the task of consecration, of supporting the established order of things. This is a load that it discards extremely slowly, in the course of millennia, becoming in the process a private thing, enabling poets and writers to express their own personal troubles and raise them to the level of consciousness. Literature gets to this point, I would add, by means of combinatorial games that at a certain moment become charged with preconscious subject matter, and at last find a voice for these. And it is by this road to freedom opened up by literature that

men achieved the critical spirit, and transmitted it to collective thought and culture.

VI

Concerning this double aspect of literature, here, toward the end of my little talk, it is relevant to mention an essay by the German poet and critic Hans Magnus Enzensberger, "Topological Structures in Modern Literature," which I read in the Buenos Aires magazine *Sur* (May-June 1966). He reviews the numerous instances of labyrinthine narratives from ancient times up to Borges and Robbe-Grillet, or of narratives one inside another like Chinese boxes, and he asks himself the meaning of modern literature's insistence on these themes. He evokes the image of a world in which it is easy to lose oneself, to get disoriented—a world in which the effort of regaining one's orientation acquires a particular value, almost that of a training for survival. "Every orientation," he writes, "presupposes a disorientation. Only someone who has experienced bewilderment can free himself of it. But these games of orientation are in turn games of disorientation. Therein lies their fascination and their risk." The labyrinth is made so that whoever enters it will stray and get lost. But the labyrinth also poses the visitor a challenge: that he reconstruct the plan of it and dissolve its power. If he succeeds, he will have destroyed the labyrinth; for one who has passed through it, no labyrinth exists." And Enzensberger concludes: "The moment a topological structure appears as a metaphysical structure the game loses its dialectical balance, and

literature turns into a means of demonstrating that the world is essentially impenetrable, that any communication is impossible. The labyrinth thus ceases to be a challenge to human intelligence and establishes itself as a facsimile of the world and of society."

Enzensberger's thesis can be applied to everything in literature and culture that today—after von Neumann—we see as a combinatorial mathematical game. The game can work as a challenge to understand the world or as a dissuasion from understanding it. Literature can work in a critical vein or to confirm things as they are and as we know them to be. The boundary is not always clearly marked, and I would say that on this score the spirit in which one reads is decisive; it is up to the reader to see to it that literature exerts its critical force, and this can occur independently of the author's intentions.

I think this is the meaning one might give to my most recent story, which comes at the end of my book *t zero*. In this story we see Alexandre Dumas taking his novel *The Count of Monte Cristo* from a supernovel that contains all possible variants of the life story of Edmond Dantès. In their dungeon Edmond Dantès and the Abbot Faria go over the plans for their escape and wonder which of the possible variants is the right one. The Abbot Faria digs tunnels to escape from the castle, but he always goes wrong and ends up in ever-deeper cells. On the basis of Faria's mistakes Dantès tries to draw a map of the castle. While Faria, by the sheer number of his attempts, comes close to achieving the perfect escape, Dantès moves toward imagining the perfect prison—

the one from which no escape is possible. His reasons are explained in the passage I shall now quote:

If I succeed in mentally constructing a fortress from which it is impossible to escape, this imagined fortress either will be the same as the real one—and in this case it is certain we shall never escape from here, but at least we will achieve the serenity of knowing we are here because we could be nowhere else—or it will be a fortress from which escape is even more impossible than from here—which would be a sign that here an opportunity of escape exists: we have only to identify the point where the imagined fortress does not coincide with the real one and then find it.

And that is the most optimistic finale that I have managed to give to my story, to my book, and also to this essay.

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Introduction

Microhistory

In September of 1960, an exceptionally diverse group met at Cerisy-la-Salle on the occasion of a colloquium devoted to the work of Raymond Queneau. The title of these proceedings, "Une nouvelle défense et illustration de la langue française," was in many ways exemplary: if it recalled the Pléiade and its poetic manifesto, it also announced another group, the Ouvroir de Littérature Potentielle. For it was at Cerisy, on the initiative of Queneau and François Le Lionnais, that the Oulipo was conceived. It was born two months later, on 24 November 1960, to be precise, the day of its first official meeting. The ten founding members came from various disciplines: writers, mathematicians, university professors, and pataphysicians.¹ The group began as a subcommittee of the Collège de Pataphysique (although, early on, the *official* affiliation with that group would be dropped), under the title, "Séminaire de Littérature Expérimentale." But at their second meeting, the more modest and (to their way of thinking) more precise title was adopted: "Ouvroir de Littérature Potentielle." Since then, the Oulipo has pursued its research with admirable assiduity. In the last twenty-five years, several more people have joined the group; today, the Oulipo includes twenty-five members.²

In its first years, the Oulipo worked in voluntary obscurity. During its first decade, the group's public activities were relatively rare: a presentation of their work to the Collège de Pataphysique in 1961, a special issue of *Temps Mêlés* devoted to the Oulipo in 1964, and, in the same year, a "semi-public meeting" of the group recorded for Belgian radio. In its first decade, however, various members of the Oulipo individually published texts which were in large measure inspired by that group's work, notably Jacques Bens's *41 Sonnets irrationnels* (1965), Jacques Roubaud's *€* (1967), Jacques Duchateau's *Zinga 8* (1967), Noël Arnaud's *Poèmes Algol* (1968), and Georges Perec's *La Disparition* (1969).

It was in 1973, with the publication of *La Littérature potentielle*, that the Oulipo began to affirm itself openly. The collection offered a representative sampling of Oulipian production, including theoretical texts and exercises. All are relatively short, and as a group they exemplify the two principal directions of Oulipian research: analysis, that is, the identification and recuperation of older, even ancient (but not necessarily intentional) experiments in form; and synthesis, the elaboration of new forms. As François Le Lionnais puts it in the "First Manifesto": "Anoulipism is

devoted to discovery, Synthoulipism to invention. From one to the other there exist many subtle channels." With the publication of *La Littérature potentielle*, the Oulipo's timidity slowly began to erode, and the group began to participate in colloquia and programs of various sorts: a presentation at Reed Hall in 1973, at "Europalia 75 France" in Brussels in 1975, on France-Culture Radio in 1976, at the Centre Pompidou in 1977, at the Fondation de Royaumont in 1978, and at the Festival de la Chartreuse de Villeneuve-lès-Avignon since 1977.

Three important texts have appeared in recent years. In *Oulipo 1960–1963* (1980), Jacques Bens, the first "provisional secretary" of the group, published the minutes of the Oulipo's monthly meetings from 1960 to 1963. These documents are both interesting and amusing: if they furnish material for future literary historians, they also testify eloquently to the ludic spirit that has consistently animated the group. *Atlas de littérature potentielle* (1981), a collective effort, responds to *La Littérature potentielle*; like the latter, it includes both theoretical texts and illustrative exercises, offering an update on Oulipian activity since 1973. In *La Bibliothèque Oulipienne* (1981), Slatkine has collected and reprinted the first sixteen volumes of the Oulipo's "library." This series was created in 1974 on Queneau's initiative; it consists of texts written by members of the Oulipo and published privately, the edition of each volume being limited to 150 copies. The texts included in *La Bibliothèque Oulipienne* are intermediary forms; that is, they fall somewhere between the short exercises of the previous collections and longer works such as Perec's *La Vie mode d'emploi* and Italo Calvino's *If on a winter's night a traveler*. But like these other writings, each text in *La Bibliothèque Oulipienne* results from the application of a given Oulipian principle or theory.

One Hundred Trillion Poems

Of what do Oulipian theories consist? The purpose of the present collection is to respond to that question and to give the English-speaking reader ingress into the Oulipian labyrinth. The texts have been chosen to provide a sampler of Oulipian poetic theory, from the polemical language of the early manifestoes to the more elaborate formulations of a startling literary aesthetic.

Many of the texts included herein were either produced or inspired by Raymond Queneau (of whom Roland Barthes said, "His entire *œuvre* embraces the literary myth"); more than any other, Queneau nourished and directed the evolution of the group. Queneau's definition of the Oulipo's work is, moreover, succinct: potential literature is "the search for new

forms and structures that may be used by writers in any way they see fit." And François Le Lionnais adds, "The Oulipo's goal is to discover new structures and to furnish for each structure a small number of examples." It is obvious, then, that Queneau and Le Lionnais conceive of the Oulipo's vocation in terms of a formal quest. In order to render its parameters more precisely, one might briefly consider Queneau's *Cent Mille Milliards de poèmes* (one hundred thousand billion poems), for this work, exemplary in many ways, echoes throughout the essays in this collection and permeates the Oulipian enterprise as a whole: it may be regarded as the seminal Oulipian text.

At first glance, it looks like nothing more than a collection of ten sonnets, but these poems obey formal laws far more vast and rigorous than those of the traditional sonnet. In fact, they constitute a combinatory ensemble: each line of each poem may replace (or be replaced by) its homologue in the nine other poems. Thus, to each of the ten first lines, the reader can add any of ten different second lines; there exist therefore 10^2 , or one hundred possible combinations for the first two lines. Given that the sonnet has fourteen lines, the possibilities offered by the collection as a whole are of the order of 10^{14} , or one hundred trillion sonnets. The text, in its *potential* state, thus results from the Cartesian product of fourteen sets of ten elements each; that is, the combinatory possibilities are exhausted and repetition of combination is excluded. Faced with a work of this kind, the reader will necessarily encounter a certain number of practical problems. Queneau himself, in the preface, acknowledges the most thorny among them: the time which a close textual reading demands. According to his calculations, if one read a sonnet per minute, eight hours a day, two hundred days per year, it would take more than a million centuries to finish the text. François Le Lionnais, in his postface to the work, notes the same problem, if in a somewhat less brutal manner: "Thanks to this technical superiority, the work you are holding in your hands represents, itself alone, a quantity of text far greater than everything man has written since the invention of writing, including popular novels, business letters, diplomatic correspondence, private mail, rough drafts thrown into the wastebasket, and graffiti."

This text may engender a whole range of reactions: where certain individuals see an example of original, conscious, and lucid poetic innovation, others will see only empty acrobatics, pretension, and literary madness. Polemics of this sort frequently surround the experimental text; very often, the latter draws (or exhausts) the better part of its force therein. The principal disadvantage of these controversies is that they neglect the capitally important question of textual mechanism. And as interesting as this whole problematic may be, it will not lead us very far in a consideration

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of the *Cent Mille Milliards de poèmes*. Without then entering into a polemic concerning the literary value of this text, we may at least draw one firm conclusion: the *Cent Mille Milliards de poèmes*, in its conception and its execution, stands as the foremost model for the Oulipian enterprise.

First of all, it responds amply to the “analytic” intent, the desire to recuperate and revivify traditional constraining forms. If the sonnet is a far less ancient form than, say, rhopalic verse (a fine example of which is offered by Harry Mathews’s “Liminal Poem”), it imposes nonetheless a multiplicity of constraints that are, of course, arbitrary at the outset but become highly codified through use (and it is precisely this “use” that separates the normative text from the experimental). Moreover, given that the sonnet as a poetic form has fallen into disuse, it is not surprising that it elicited the interest of Queneau, who called the death of the *ballade* and the *rondeau* “disasters.”

In addition, the *Cent Mille Milliards de poèmes* faithfully reflects the “synthetic” aspect of Oulipian work, the obvious intent behind it being to elaborate a new poetic form, a combinatory form. In fact, this new form, given its basic material, the individual precombinatory sonnet, erects a whole system of meta-constraints: if the traditional metrics remain essentially intact (the combinatory integer being the alexandrine), the rhyme scheme and the syntactic and semantic structures must, on the contrary, bow to the new formal rules imposed by the combinatory ensemble. Each line of the ten master sonnets must be capable of being coherently integrated into a quasi-infinity of derived sonnets.

This leads to a final conclusion about this text: like a hulking iceberg, the *Cent Mille Milliards de poèmes* manifests only a fraction of its bulk. Its reader can accede to a certain number of derived sonnets (the quantity depending on the degree of the reader’s initiative, or perhaps on the depth of his or her monomania); turning to mathematics, the reader can determine their exact number. But it is obvious that even in a lifetime of diligent reading, one can read only a small portion of the sonnets theoretically engendered by the combinatory mechanism: *ars longa, vita brevis*. The rest remain in the *potential* state, and this fact, more than anything else, accounts for the status of this text within the *Ouvroir de Littérature Potentielle*.

Literary Madness and the Canon

Left unanalyzed, this innovation, this seemingly ferocious (post)modernism, would appear to belie the Oulipo’s avowed respect for literary tradition. That is, what Oulipians call the “analytic” and the “synthetic”

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aspects of their work would seem necessarily to be in contradiction. In fact, this is not the case, the apparent problem residing in the word “tradition”: the Oulipo manifests enormous respect for the experimentalist tendency within the tradition of literature. Its members have pointed out and paid homage to writers from Lasus of Hermione to the Grands Rhétoriqueurs, from Rabelais to Roussel: these they consider to be their direct antecedents, qualifying the work of those writers, slyly, as “plagiarisms by anticipation,” thereby suggesting the desire of the Oulipo to inscribe itself within a certain literary tradition. Georges Perec’s “History of the Lipogram,” for instance, testifies to the importance he accorded to tradition in the production of *La Disparition*, a 300-page novel written without the letter E. This example, perhaps more clearly than another, shatters the apparent paradox I alluded to, for as Perec’s essay suggests, *La Disparition*, received as resolutely avant-gardist, is in fact merely the most recent manifestation of a venerable literary tradition that can be traced back to the sixth century B.C.

In that same essay, Perec protests “a critical misappreciation as tenacious as it is contemptuous”:

Exclusively preoccupied with its great capitals (Work, Style, Inspiration, World-Vision, Fundamental Options, Genius, Creation, etc.), literary history seems deliberately to ignore writing as practice, as work, as play. Systematic artifices, formal mannerisms (that which, in the final analysis, constitutes Rabelais, Sterne, Roussel . . .) are relegated to the registers of asylums for literary madmen, the “Curi osities”: “Amusing Library,” “Treasure of Singularities,” “Philological Entertainments,” “Literary Frivolities,” compilations of a maniacal erudition where rhetorical “exploits” are described with suspect complaisance, useless exaggeration, and cretinous ignorance. Constraints are treated therein as aberrations, as pathological monstrosities of language and of writing; the works resulting from them are not even worthy to be called “works”: locked away, once and for all and without appeal, and often by their authors themselves, these works, in their prowess and their skillfulness, remain paraliterary monsters justiciable only to a symptomatology whose enumeration and classification order a dictionary of literary madness.

Perec, like the other members of the Oulipo, is aware that the notion of literary madness is often invoked in order to suppress innovation and thus to maintain the hegemony of the canon. The Oulipo’s attitude toward the concept is thus somewhat ambivalent: on the one hand, relying heavily on systematic artifice and formal mannerisms in their own literary praxis, they are open to accusations of literary madness, accusations intended to

confine them and their work in the literary ghetto. On the other hand, they profess interest in literary madmen and, more generally (for obvious reasons), in literary marginalia of many sorts. The problem perhaps lies in the definition of literary madness and in the rhetoric in which the notion is couched. Queneau, who studied literary madmen in the 1930s at the Bibliothèque Nationale with a view toward elaborating an encyclopedia of *folie littéraire*, preferred the term "heteroclite." André Blavier, whose *Les Fous littéraires* (1982) follows Queneau's initiative, insists that "the appellation 'literary madman' is used nonpejoratively." For the purposes of his work, moreover, Blavier establishes several criteria for literary madness: the writer in question must be a *fou avéré* (an "established madman," which may seem to beg the question); he must have been entirely ignored by the critics and the general public; his work must have been published in printed form; and, finally, he most probably was a rich bourgeois, since he would have had to pay the publication costs himself.

Jean Lescure, in his "Brief History of the Oulipo," alludes to a discussion that focused upon the notion of literary madness:

The position of the Oulipo in regard to literature is determined in memorandum #4, minutes of the meeting on 13 February 1961, in the following form: *Jean Queval intervened to ask if we are in favor of literary madmen. To this delicate question, F. Le Lionnais replied very subtly:*

—We are not against them, but the literary vocation interests us above all else.

And R. Queneau stated precisely:

—The only literature is voluntary literature.

We shall have occasion to return to this notion of "voluntary literature"; for the moment, suffice it to say that it is linked to the notion of writing as praxis. It is through this more than anything else that the Oulipo lays its claim to sanity: Georges Perec, asked by an interviewer how he faced the risk of madness while writing, responded that he had been accumulating experiences of literary "madness" for years without having the impression that he was doing anything "madder" than, quite simply, *writing*.³

Tradition and Experiment

The Oulipo's relation to the literary establishment is thus problematical. François Le Lionnais addresses this question with ironic relativism:

The truth is that the Quarrel of the Ancients and the Moderns is permanent. It began with Zinjanthropus (a million seven hundred and

fifty thousand years ago) and will end only with humanity—or perhaps the mutants who succeed us will take up the cause. A Quarrel, by the way, very badly named. Those who are called the Ancients are often the stuffy old descendants of those who in their own day were Moderns; and the latter, if they came back among us, would in many cases take sides with the innovators and renounce their all too faithful imitators.

For the time being, at least, the weight of the canon or, more properly, that of the institutions which codify and guarantee it, is oppressive. And for all the radical refusal and apparent subversion of traditional literary norms, a rather touching yearning also echoes within the Oulipian enterprise. If their indignation at being excluded from the mainstream is genuine, so is their nostalgia for a time when inclusion, rather than exclusion, was the rule. The former sentiment is perhaps more legitimate than the latter, but it is no more insistent in the Oulipo's work, where patently polemical stances are often implied through Adamic language:⁴ palindromes, lipograms, tautograms, heretograms, pangrams.

The tension thus engendered results in a curious paradox in Oulipian "analysis": on the one hand, Queneau's work on literary madmen, Blavier's *Les Fous littéraires*, and Perec's "History of the Lipogram," focusing as they do upon writers who must surely stand as the most obscure figures of Western literature, may be read as prolegomena to a systematic erection of an anti-canonical. On the other hand, the Oulipo has proclaimed its spiritual affinity to literary figures whose place in the canon is unquestioned by even the most orthodox. In the "Second Manifesto," François Le Lionnais announces this, attenuating the solemnity of an avowal of literary debt through irony: "Occasionally, we discover that a structure we believed to be entirely new had in fact already been discovered or invented in the past, sometimes even in a distant past. We make it a point of honor to recognize such a state of things in qualifying the text in question as 'plagiarism by anticipation.' Thus justice is done, and each is rewarded according to his merit."

Jacques Bens returns to this notion, rendering it somewhat more specific, citing as exemplary plagiarizers-by-anticipation Rabelais, Villon, Marot, and the Grands Rhétoriqueurs. "And we shall not forget that there existed in their time an eminently potential type of literature, the *commedia dell'arte*, which acquired really definite form only at the very moment of its staging."

Perhaps both concerns, the recuperation of obscure literary figures and the work on major figures, are symptomatic of a broader irredentist impulse. This seems clear, for instance, in Jean Lescure's account of an early Oulipian project, a history of experimental literature: that study undoubt-

edly would have put normative literary hierarchies into question, through savant juxtaposition of the marginal and the mainstream. But it must be noted (a commentary on this whole problematic as eloquent as any other) that the project has thus far failed to bear tangible fruit:

Our first labors immediately indicated the desire to inscribe the Oulipo within a history. The Oulipo didn't claim to innovate at any price. The first papers dealt with ancient works, works that might serve as ancestors if not as models for the work we wanted to begin. This led us to consider according a good deal of our efforts to an H.L.E., or *Histoire des littératures expérimentales*. Here, we saw the notion of experimentation or exercise reappear; at the same time we were beginning to realize that which distinguished us from the past: potentiality. . . . It's because we had the profound feeling that we were not an absolute beginning but rather that we belonged to a tradition that the Oulipo decided to bring together texts for an anthology of experimental literature.

In the "synthetic" dimension of the Oulipo's work, devoted to the elaboration of new poetic structures, an analogous problem presented itself: cultural resistance to innovation. As François Le Lionnais puts it in the "Second Manifesto": "But can an artificial structure be viable? Does it have the slightest chance to take root in the cultural tissue of a society and to produce leaf, flower, and fruit? Enthusiastic modernists are convinced of it; diehard traditionalists are persuaded of the contrary."

On this point, "analysis" would seem to inform and encourage "synthesis," as the Oulipo once again turns to the sonnet, that touchstone of experiment in poetic form. Jacques Roubaud pertinently notes that "the first sonnet, at the moment of becoming a sonnet, is not a sonnet but a Sicilian variant of the Provençal *cobla*. It is only with the thousandth sonnet (or more or less—in any case after many sonnets) that the sonnet appears." Roubaud further states that the sonnet, like other traditional constraining forms, is imperialistic, for it progressively "invades everything." He argues that this process of multiplication is diametrically opposed to the purest concept of *potential* literature, and warns his fellow members against the temptations thereof: "Oulipian constraint, on the contrary, can tend toward multiplicity (toward which, seemingly, it is tending) only in ceasing to be Oulipian."

Multiplicity comes in many colors. Roubaud, I think, speaks for the majority in suggesting that the Oulipo not multiply examples of each new poetic structure it derives; to do so would be, in a sense, to forge the very sort of chains it is trying so diligently to break. But Queneau's *Cent Mille Milliards de poèmes* is surely multiple and at the same time, as we have seen, quintessentially *potential*. Thus, whereas the sonnet leads Roubaud

to evoke the specter of rigid cultural codification, other members of the Oulipo see in that form, on the contrary, possibilities of creative liberty. François Le Lionnais alludes to this liberating virtue of form: "Nine or ten centuries ago, when a potential writer proposed the sonnet form, he left, through certain mechanical processes, the possibility of a choice." If the Oulipo has devoted, and continues to devote, much of its effort to an examination of the sonnet form, it is largely because of this "choice." Roubaud notes that "the Oulipian exploration of the sonnet constitutes for Queneau a practical means of . . . 'demonstration' according to constraints." And the demonstration in question takes place in the "analytic" as well as the "synthetic" dimensions, as Queneau's experiments on Mallarmé's sonnets in the present collection will show. The latter author occupies a privileged position in the Oulipian laboratory: with poker face firmly in place, Queneau informs us that "Mallarmé's sonnets are very high-grade material, like the fruit fly in genetics."

The Workroom

Returning to first principles, then, there remains the question of method; here, the image of the laboratory is perhaps not the central one, insofar as the group ultimately chose to call itself neither *Laboratoire* nor *Séminaire* but rather *Ouvroir de Littérature Potentielle*. The French word *ouvroir* has three principal meanings: it denotes the room in a convent where the nuns assemble to work, a charitable institution where indigent women engage in needlework, and a "sewing circle" where well-to-do ladies make clothes for the poor and vestments for the Church (the English word "workroom" thus does not convey the full savor of the term). In choosing it, the Oulipo's intention, like that of much of the work produced by the group in the last twenty-five years, was undoubtedly both frank and ironical. Jean Lescure, in his "Brief History of the Oulipo," playfully suggests why the original appellation was changed: "*Séminaire* bothered us in that it conjures up stud farms and artificial insemination; *ouvroir*, on the contrary, flattered the modest taste that we shared for beautiful work and good deeds: out of respect for both fine arts and morals, we consented to join the *ou* to the *li*."

Moreover, *ouvroir* is etymologically related to the verb *ouvrir*, "to work," in the sense of "working" a given material: wood, copper, stone, and so forth. It is also related to the noun *ouvrier*, "worker"—as Larousse would have it, "a person who, in exchange for a salary, performs manual work for an employer." Last, it is related to *oeuvre*; herein, one can detect the final level of Oulipian taxonomic play. For *oeuvre* has strayed from the etymon in a striking manner: applied to an individual literary text, for

instance, it connotes far more than a mere "work"; applied to a body of texts produced by an author, it suggests completion, consecration, canonization if you will. When Perec, for instance, criticizes the literary establishment for its disdain of writing "as practice, as work," he is implicitly opposing *ouvroir* to *oeuvre*, labor to inspiration, collective effort to individual genius, the artisan to the artist.

The notion of the artisanal nature of literary work is central to Oulipian poetics. Jacques Roubaud says, "The claim to craftsmanship reflects an affirmation of amateurism; it is a voluntary archaism." Here, "voluntary" is a key word: Queneau, it will be recalled, invoked it in a discussion of literary madmen as the sine qua non of literature. And the Oulipo's claim to craftsmanship is intimately related to the concept of "voluntary" or "conscious" literature, just as it starkly opposes the myth of literary inspiration. Jean Lescure speaks of Queneau's attack on literary inspiration in *Odile*, and suggests its importance for the Oulipo as a whole:

If I may refer to the henceforth famous dictum in *Odile*, we can add to this notion the considerable consequences resulting from the fact that: *The truly inspired person is never inspired, but always inspired*. What does this mean? What? This thing so rare, inspiration, this gift of the gods which makes the poet, and which this unhappy man never quite deserves in spite of all his heartaches, this enlightenment coming from who knows where, is it possible that it might cease to be capricious, and that any and everybody might find it faithful and compliant to his desires? The serious revolution, the sudden change this simple sentence introduced into a conception of literature still wholly dominated by romantic effusions and the exaltation of subjectivity, has never been fully analyzed. In fact, this sentence implied the revolutionary conception of the objectivity of literature, and from that time forward opened the latter to all possible modes of manipulation. In short, like mathematics, literature could be *explored*.

And explore it the Oulipians have, from the pyramids of rhopalic verse to the bas-relief of Poe's tomb. As "analysis" nourishes "synthesis," one of the Oulipo's principal goals becomes clearer: as Queneau puts it, the Oulipo intends to elaborate "a whole arsenal in which the poet may pick and choose, whenever he wishes to escape from that which is called inspiration," an elegant formulation of the Oulipo Militant.

Formal Constraint

Erecting the aesthetic of formal constraint, then, the Oulipo simultaneously devalues inspiration. As François Le Lionnais notes, there are many

degrees of constraint, ranging from minimal to maximal: "Every literary work begins with an inspiration (at least that's what its author suggests) which must accommodate itself as well as possible to a series of constraints and procedures that fit inside each other like Chinese boxes. Constraints of vocabulary and grammar, constraints of the novel (division into chapters, etc.) or of classical tragedy (rule of the three unities), constraints of general versification, constraints of fixed forms (as in the case of the rondeau or the sonnet), etc."

Clearly, Le Lionnais conceives the range of constraint in terms of a hierarchy. Simplifying grossly, one might postulate three levels: first, a minimal level, constraints of the language in which the text is written; second, an intermediate level, including constraints of genre and certain literary norms; third, a maximal level, that of *consciously* preelaborated and *voluntarily* imposed systems of artifice. No text can skirt the minimal level and remain readable; perhaps no text can wholly avoid the intermediate level. But it is the maximal level that concerns the Oulipo: this is what they refer to in using the word "constraint"; this is what characterizes their own poetic production and, consequently, the model they propose to others.

Implicit in the aesthetic of formal constraint is a rather broad leap of faith in the passage from production to reception. If the Oulipo insists on rigidly constraining formal organization, it is in the belief that this will engender texts of exceptional merit, another avatar of the aesthetic of *dificulté vaincue*. It rapidly becomes clear that this, too, can be conceived as a hierarchy: increasing the difficulty of the problems posed necessarily increases—here is the leap of faith—the merit of its eventual solution. Thus, François Le Lionnais is moved to argue:

The efficacy of a structure—that is, the extent to which it helps a writer—depends primarily on the degree of difficulty imposed by rules that are more or less constraining.

Most writers and readers feel (or pretend to feel) that extremely constraining structures such as the acrostic, spoonerisms, the lipogram, the palindrome, or the holorhyme (to cite only these five) are mere examples of acrobatics and deserve nothing more than a wry grin, since they could never help to engender truly valid works of art. Never? Indeed. People are a little too quick to sneer at acrobatics. Breaking a record in one of these extremely constraining structures can in itself serve to justify the work; the emotion that derives from its semantic aspect constitutes a value which should certainly not be overlooked, but which remains nonetheless secondary.

If the Oulipo is unanimous in promoting the use of formal constraint, there is, however, some internal debate as to the number of texts resulting

from any given constraint. Queneau, as Roubaud sees it, calls for *unicity*: once a constraint is elaborated, a few texts are provided to illustrate it. The group then turns to other concerns, and the texts thus engendered are disseminated to the public. Roubaud himself, we recall, cautions against the proliferation of texts resulting from a given constraint; for him, "the ideal constraint gives rise to one text only." Most severely doctrinaire of all would seem to be Le Lionnais, characterized by Roubaud as an "ultra" because of his insistence that the only text of value is the one that formulates the constraint; all texts resulting therefrom, preaches Le Lionnais, must be banished to the limbo of the "applied Oulipo." Roubaud argues that Le Lionnais's position neglects the deductive aspect of the method, and postulates that "a constraint must 'prove' at least one text."

Regarding the nature of the constraint itself, though, there seems to be widespread agreement. As Roubaud puts it, "A good Oulipian constraint is a simple constraint." Of course, this does not mean that the application of the constraint will be simple; neither does it mean that the text resulting from it will be simple. Consider the case of Georges Perec's *La Disparition*, the novel written without the letter E. What could be simpler than the decision to exclude a letter of the alphabet from a text? Patently, this constraint is simple and thus—another leap of faith—elegant. In the passage from conception to application, however, simplicity engenders complexity: as Perec himself notes, "the principle of the lipogram is childishly simple; its application can prove to be excessively difficult."

Roubaud postulates "two principles sometimes respected in Oulipian work": first, that "a text written according to a constraint must speak of this constraint," and second, that "a text written according to a mathematizable constraint must contain the consequences of the mathematical theory it illustrates."⁵ He cites *La Disparition* as an example of the first principle, and suggests that it is precisely in this, rather than merely in its length, that the text differs from all previous experiments in the lipogram:

In what does the Oulipization of this constraint, as old or almost as old as the alphabet, consist? In this, which is a fundamental trait: that, as opposed to the different plagiarists who use the lipogram as a process of translation (Nestor of Laranda and the *Iliad*), process of mnemotechnics, moral or metaphysical formulary . . . the constraint therein is at once principle of the writing of the text, its developmental mechanism, and at the same time the meaning of the text: *La Disparition* is a novel about a disappearance, the disappearance of the e; it is thus both the story of what it recounts and the story of the constraint that creates that which is recounted. This highly involved aspect of constraint (which is undoubtedly not proper to Oulipian constraint, but which is in this case practically pure) is a direct con-

sequence of the Oulipian constraints, which may be formulated in the following manner:

Axiom: Constraint is a principle, not a means.

Perec, for his part, lucidly announces the final virtue of the aesthetic (already hinted at by François Le Lionnais): the liberating potential of rigorous formal constraint: "In this sense, the suppression of the letter, of the typographical sign, of the basic prop, is a purer, more objective, more decisive operation, something like constraint degree zero, after which everything becomes possible." This aspect of the aesthetic is startling, since it seems so strongly counterintuitive, and yet Perec and his fellow members appear to be persuaded of it. Perec, whose considerable poetic production might serve as a casebook on systematic artifice, even goes so far as to suggest that writing a poem "freely" would be more problematical for him than writing according to a system of formal constraint: "I don't for the moment intend to write poetry other than in adopting such constraints. . . . The intense difficulty posed by this sort of production . . .

Granted that formal constraint becomes the hallmark of the Oulipian

text, Paul Braffort is led to characterize the Oulipo's work as "non-Gentilhomme, II, iv, where Monsieur Jourdain discovers to his astonishment that "everything which is not prose is poetry, and everything which is not poetry is prose." Braffort's comment is both amusing and highly ironic, but it nonetheless advances the rather serious suggestion that traditional taxonomy is no longer sufficient in distinguishing between "quasi-amorphous texts and texts produced according to rigorous constraints." To offer a concrete illustration of this, one might argue, for instance, that *La Disparition* resembles Harry Mathews's "Liminal Poem" more closely than it resembles *Eugénie Grandet*; or that the *Cent Mille Milliards de poèmes* is fundamentally more similar to Italo Calvino's novel *If on a winter's night a traveler*, or even to Scève's *Délire*, than it is to Nerval's *Chimères*. Through all these pyrotechnics, the Oulipo's message is at once becomingly modest and outrageously bold; Jean Lescure has offered a lapidary formulation thereof: "What the Oulipo intended to demonstrate was that these constraints are felicitous, generous, and are in fact literature itself."

Mathematics

Oulipian systems of formal constraint are often based on the alphabet. But in many cases, as the reader has undoubtedly begun to suspect, the nature

of Oulipian constraint is mathematical. At the center of the group's poetics is the idea of the essential analogy of mathematics and literature. Much of their work may be seen as an attempt to demonstrate the complementarity of these two modes of discourse, which are thought by many to be mutually exclusive. While the reciprocal relations of music and literature have received a considerable amount of attention—one could catalogue examples from Orpheus to *Doctor Faustus*—the same is not true of mathematics and literature, although some suggest that mathematics is the link between literature and music, and music is what poetry aspires to. Arguably, the connection between architecture and literature (which seems clear, for instance, in the architectonic elegance of fixed form poetry, and is demonstrably insistent on the thematic level in many works whose formal organization would appear to be less rigorous, the most salient example being Hugo's *Notre-Dame de Paris*) is essentially a connection between literature and mathematics.

In spite of this resistance, the notion of the analogy of mathematics and literature has always existed on the margins of the latter, and this aspect of the Oulipian enterprise has a certain number of authoritative antecedents. Pythagoras, for example, taught that number was the essence of all things, and that any relation, from natural relations to those occurring in music and poetics, could be expressed mathematically. Plato, in the *Meno* and the *Republic*, argues that geometry is the foundation of all knowledge: this belief, and the consequences for aesthetics that arise from it, revived in the neo-Platonic disputes of the Middle Ages. In the Renaissance, the aesthetics of mathematics and the mathematics of aesthetics are clear in the work of Leonardo. Later, in France, Descartes, Pascal, and d'Alembert were both writers and mathematicians. In Germany, Schopenhauer (in *World as Will and Idea*) suggested the similarity of poetical and mathematical conceptualization. Lautréamont, in his *Poésies*, argues that "poetry is geometry par excellence," using that notion in a global and singularly vituperative attack on Romanticism. But it is perhaps Lewis Carroll who best achieves what François Le Lionnais refers to as the "amalgam" of mathematics and literature: that is, the conscious application of one to the other, the exploitation of their *potential* for interpenetration. In our own century, Valéry studied mathematics as "a model of acts of the mind," and Ezra Pound, in his *Spirit of Romance*, declares that "poetry is a sort of inspired mathematics." Finally, the mutual complementarity of literature and mathematics has been elaborated at some length by Scott Buchanan, in *Poetry and Mathematics*, although it must be noted that his point of view betrays a distinct bias toward mathematics.

François Le Lionnais situates the Oulipo's contribution to this tradition as follows: "Visited by mathematical grace, a small minority of writers

and artists (small, but weighty) have written intelligently and enthusiastically about 'the queen of sciences.' Infinitely rarer are those who—like Pascal and d'Alembert—possessed double nationality and distinguished themselves both as writers (or artists) and as mathematicians. Outside, perhaps, of Lewis Carroll and some Oulipians, I know of only Raymond Queneau who has brought about in his work, to such a fine degree, the intimate amalgam of poetical inspiration and mathematical sense of structure."

The notion of "double nationality" is singularly appropriate in the case of the Oulipo, for the group harbors many fine amateur mathematicians as well as three professionals: Jacques Roubaud, Claude Berge, and Paul Braffort, whose fields of specialization are, respectively, pure mathematics, graph theory, and artificial intelligence. It is thus wholly logical to find that whereas the antimathematical prejudice in literature is often articulated around the more pernicious fear of the mechanistic model that subtends it, the Oulipo embraces this mechanistic model. In doing so, its members are conscious of working against the grain of contemporary poetics, yet they remain convinced that mathematics is functional in even the most apparently amathematical text. Queneau himself noted a very elemental level of this function: "The poet, however refractory toward mathematics he may be, is nonetheless obliged to count up to twelve in order to compose an alexandrine."

Roubaud, for his part, notes the influence of Nicolas Bourbaki's *Éléments de Mathématique* on the Oulipo, calling the former "a sort of mathematical surrealism." Roubaud further characterizes the essential stance of the group in this regard: "To comport oneself toward language as if the latter could be mathematized; and language can be mathematized, moreover, in a very specific fashion." This leads him to formulate a series of conjectures and principles: "Arithmetic applied to language gives rise to texts"; "Language producing texts gives rise to arithmetic"; "A constraint is an axiom of a text"; "Writing under Oulipian constraint is the equivalent of the drafting of a mathematical text which may be formalized according to the axiomatic method." The polemical, reactive intent of these statements is obvious—they of course rejoin the broader attack on the notion of literary inspiration—but apart from that, the theory they expose corresponds very closely to Oulipian praxis, as several of the essays in the present collection will demonstrate. They may also suggest the long march from simple arithmetic to the form of higher mathematics that Oulipo privileges in its work: combinatorics. Claude Berge, in "For a Potential Analysis of Combinatory Literature," has offered a definition of combinatorics, suggesting the importance of the discipline within Oulipian poetics:

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 Milliards 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 combinatorial 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 of 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). 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 in 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.

Here, it should be noted that Oulipian aesthetics rejoins the critical avant-garde: in the mid-1960s, critics such as Umberto Eco and B. A. Uspenski began to apply the name "combinatorics" to the permutational phenomena in certain narrative forms (these phenomena and their combinatoric nature having of course been pointed out, much earlier, by Vladimir Propp, but without using the magic word). The term gradually came to acquire the critical vogue that it enjoys today. Many of the essays in the present collection testify to the Oulipo's concern with combinatorics: Queneau's "A Story as You Like It" and "The Relation X Takes Y for Z," Italo Calvino's "Prose and Anticombinatorics," Paul Fournel's "The Theater

Tree: A Combinatory Play," Harry Mathews's "Mathews's Algorithm," and Bens, Berge, and Braffort's "Recurrent Literature" all speculate upon, or exploit, combinatoric theory and its potential.

If the Oulipo insists upon combinatorics in its poetics, it is perhaps because combinatorics, whose status as a mathematical discipline is now established, is demonstrably functional in many literary structures, even some of the most traditional ones. That is, combinatorics offers a privileged locus for the interplay of mathematics and literature. All of this, perhaps inevitably, granted the practical problems inherent in the manipulation of complex combinatoric structures, leads to experimentation with computers. Queneau, in "Potential Literature," which dates from early 1964, says that the constant *lamento* of the group at that time was its lack of access to sophisticated machinery. Since then, things have changed for the Oulipo, as they have for many of us; Paul Fournel's "Computer and Writer: The Centre Pompidou Experiment" seems to suggest that the Oulipo in the future progressively will be drawn toward a more systematic exploration of the literary possibilities offered by the computer.

Aleatorics and Anti-Aleatorics

If the image of the computer has undoubtedly caused many literati to shudder, conjuring up as it does the machine and its ghost, it must be noted that it is because of the *potential* the computer furnishes to the mechanistic model that the Oulipians are drawn to it. The computer constitutes thus another arm in the arsenal they deploy against the notion of inspiration and, in a broader sense, against the avowed *bête noire* of the Oulipo: the aleatory. For another way of considering the Oulipian enterprise is as a sustained attack on the aleatory in literature, a crusade for the maximal motivation of the literary sign. All of their work, from short exercises in highly constraining form to far longer texts resulting from the application of Oulipian theory, from the indications of a nostalgic longing for a mythological primitive language to their insistence on *voluntary* or *conscious* literature, may be read in this light. As Jacques Bens expresses the position: "The members of the Oulipo have never hidden their abhorrence of the aleatory, of bogus fortunetellers and penny-ante lotteries: 'The Oulipo is anti-chance,' the Oulipian Claude Berge affirmed one day with a straight face, which leaves no doubt about our aversion to the dice shaker. Make no mistake about it: potentiality is uncertain, but not a matter of chance. We know perfectly well everything that can happen, but we don't know whether it will happen."

Jacques Roubaud echoes Bens, in a discussion of Queneau's notion of *voluntary* literature: "The intentional, voluntary character of constraint to

which he insistently alludes time and again is for him indissolubly linked to this lively refusal of the frequent equation of chance and freedom." The seeming paradox we noted in Oulipian aesthetics, the belief that systems of formal constraint—far from restricting a writer—actually afford a field of creative liberty, is again apparent here. Queneau affirms, "The classical playwright who writes his tragedy observing a certain number of familiar rules is freer than the poet who writes that which comes into his head and who is the slave of other rules of which he is ignorant." The Quenellian vision of liberty is classical in this sense, insofar as its enabling condition is lucidity. His attack on the aleatory springs in part from his reaction against the surrealists, a group with which he was briefly associated and from which, like many others, he was summarily excommunicated. The surrealists erected the aleatory and the psychological construct based on it, the unconscious, as a means of transcendence; it becomes rapidly clear that Queneau's aesthetic is diametrically opposed to theirs. His attack on chance reflects, says Roubaud, "rejection of the mystical belief according to which freedom may be born from the random elimination of constraints."

And yet, in this play of terms—in which "aleatory," "random," "inspiration," and "ignorance" are opposed to "conscious," "voluntary," "constraint," and "lucidity"—tensions and even contradictions exist, for the aleatory cunningly seems to insinuate itself even where efforts to exclude it are most diligent. Roubaud recognizes this and tries to explain it, using as an example Queneau's fascination with the series of prime numbers (called by François Le Lionnais "those rebel angels"): he argues that Queneau became interested in them precisely because they "imitate chance while obeying a law"; consequently, chance is exorcised, since it is recognized for what it is and thus is mastered. His argument suggests a far thornier question going directly to the heart of Oulipian poetics: what if the law itself is aleatory—for instance, the mathematical law that permits us to engender the series of prime numbers or, analogously, the system of constraint through which an Oulipian text is generated? Speaking specifically of the Oulipian aesthetic of formal constraint, Roubaud is forced to admit a contradiction: "Queneau's attitude (and that of the Oulipo) toward traditional constraints, if it is less bold and naive than Bourbaki's, reflects nonetheless the inherent ambiguity of the procedure: on the one hand, the eminently arbitrary character of constraints is revindicated; at the same time traditional constraints are marked as arbitrary, but, precisely because they are traditional and solidly anchored in history, they guard a power of fascination that situates them elsewhere, beyond the arbitrary . . . it is difficult to get out of this."

Jacques Bens touches upon the same problem in a discussion of Queneau's work:

Before soliciting any other sort of potentiality, I would like to respond to an objection that came to my mind as we went along. "It is well known," one might object, "that Raymond Queneau constructs his novels with obstinate and laborious rigor, and cannot tolerate leaving anything to chance (he himself says it). How can one reconcile such rigor with the vagueness, the incertitude, the approximations that necessarily accompany potentiality?"

I believe, actually, that the contradictions exist solely in appearance. Or rather that there is no contradiction: it is the problem that is ill-formulated. For the writer never claimed that he detested incertitude itself but merely that incertitude born of chance, which is not at all the same thing.

On the other hand, it might very well be the same thing, and in any case the distinction that Bens draws is too nice to be of much practical value in resolving the dilemma. Perhaps one stage in the group's evolution is passed when Oulipians realize that a throw of the dice will never abolish chance; at least one other aspect of their poetics would seem to support such a suspicion: the rehabilitation of the *clinamen*. In Lucretius's account of Epicurean atomic theory, the *clinamen atomorum*, or swerving of the atoms (*De rerum natura* II, 216–93) is an essential part of the model. The random, aleatory nature of the swerving of the atoms as they fall is postulated in opposition to the constant, straight fall of the atoms in Democritus's model. Thus, the random is opposed to the deterministic, and the clinamen acquires the status of the locus, and consequently the guarantor, of free will. Stone-dead for nigh on two millennia, the clinamen has been resurrected in the last decade in critical discourse by a surprising variety of people and made to serve a surprising variety of purposes: Harold Bloom has used it extensively, as has Michel Serres, who passes it along to Jeffrey Mehlman; René Thom engendered a polemic articulated around the concept, in which Edgar Morin, Henri Atlan, and Ilya Prigogine participated.⁸ (It is both astonishing and perversely rewarding to note a convergence between the Oulipo and Harold Bloom: in both cases, the virus of the clinamen seems to have been transmitted, fittingly enough, by Alfred Jarry.)

Within the Oulipo, it is Georges Perec who has furnished the most lucid explanation of the clinamen. In a discussion of his novel, *La Vie mode d'emploi*—a text elaborated according to several very rigorous systems of formal constraint—Perec notes that a constitutive element (a chapter, in this case) of his otherwise rigidly symmetrical structure has been deliberately omitted, and explains why this must be so:

More fundamentally, this chapter must disappear in order to break the symmetry, to introduce an error into the system, because when a sys-

tem of constraints is established, there must also be anticonstraint within it. The system of constraints—and this is important—must be destroyed. It must not be rigid; there must be some play in it; it must, as they say, “creak” a bit; it must not be completely coherent; there must be a clinamen—it’s from Epicurean atomic theory: “The world functions because from the outset there is a lack of balance.” According to Klee, “Genius is the error in the system”; perhaps I’m being too arrogant in saying that; but in Klee’s work, it is very important.⁹

How are we to interpret this new “swerve” in Oulipian theory? Is it the flaw in the system, rather than the system itself, that assures creative liberty, just as the clinamen assures free will? Is this the final victory of the aleatory over the motivated? Is it the first note of a tocsin and, if so, for whom tolls the bell? In any case, probably not for the Oulipians: their regenerative powers, one notes with reassurance, are astounding. Italo Calvino, for one, is extraordinarily sanguine; in concluding his essay “Prose and Anticombinatorics,” he brings this whole problematic full circle, suggesting that the computer, that scourge of the aleatory, be placed at the service of the clinamen: “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 combinatorial search, allowing him also the best chance of concentrating on this ‘clinamen’ which, alone, can make of the text a true work of art.”

Scriptor Ludens, Lector Ludens

Even at its most polemical, even at its most ferociously doctrinaire, the Oulipo’s work over the past twenty-five years has consistently been animated by a most refreshing spirit of playfulness. The Oulipian text is quite explicitly offered as a game, as a system of ludic exchange between author and reader. Jacques Bens declares that “a potential work is a work which is not limited to its appearances, which contains secret riches, which willingly lends itself to exploration.” Used here to suggest the ideal process of reception, the key word is *exploration*, especially in view of the fact that the Oulipo uses the term to characterize its own efforts in the process of production. The parallelism thus implied privileges the reader, and this is indeed another central concept in Oulipian theory. Says Bens, “For Queneau (I repeat: *for him*), there is no, or very little, literature without a reader.” And Queneau himself demands the reader’s participation, refusing on behalf of the latter any possibility of passivity toward the literary text: “Why shouldn’t one demand a certain effort on the reader’s part?

Everything is always explained to him. He must eventually tire of being treated with such contempt.” For Queneau, reading must be a *conscious*, a voluntary act of decoding. Speaking of his own work, he declares that the novel should resemble an onion, suggesting through this image a hierarchy of hermeticism. This textual hierarchy will necessarily be engaged by a hierarchy of reading in the reception process, and indeed by a hierarchy of readers, “some being content merely to strip away the first layer of skin, while the others, far fewer, strip it layer after layer.” What Queneau was calling for, from the point of view at once of the writer and of the reader, is what Roland Barthes would later come to designate as the *texte de jouissance*, or text of ecstasy. Adopting Queneau’s aesthetic and broadening it to characterize the Oulipian quest as a whole, Jacques Bens says:

Potential literature would be that which awaits a reader, which yearns for him, which needs him in order to fully realize itself. Here, we are suddenly plunged into a somber perplexity, for everything that has any claim to be literature presents itself much in this way, from Michel de Saint-Pierre to François Mauriac.

However, if we return to the matter at hand—I mean, to our onion—we will recall that the first postulate of potentiality is the secret, that which is hidden beneath the appearances, and the encouragement for discovery. Nothing prevents us then from deciding that there will be *potential literature* if one disposes of both a resistant work and an explorer.

Thus, to the concept of potential writing corresponds that of potential reading. Faced with this conclusion, some may feel that Oulipian generosity is overshadowed by Oulipian brashness: the radical valorization of the status of the reader, rather than a gift, may seem a dare. And perhaps it is, but it is largely mitigated by the ludic spirit in which it is proposed. For serious and playful intent are not mutually exclusive in the Oulipo’s work: they are, on the contrary, insistently and reciprocally implicative. And although this posture leads some to dismiss their work as “mere” play, the Oulipians hold fast to the notion of ludic literature. Addressing this question, Jacques Roubaud argues that Oulipian work, granted its fundamentally innovative nature, “cannot avail itself of any so-called serious finality of any of the criteria serving today in scientific domains to eliminate research that unduly jostles accepted perspectives,” and concludes that its categorization as play is thus inevitable. But, he says, “it may be noted that Queneau does not refuse this often intentionally pejorative (in the case of those who distribute the labels) marginalization of the Oulipo.” Indeed, far from refusing it, Queneau embraces the notion:

I will insist, however, on the qualifier "amusing." Surely, certain of our labors may appear to be mere pleasantries, or simple witticisms, analogous to certain parlor games.

Let us remember that topology and the theory of numbers sprang in part from that which used to be called "mathematical entertainments," "recreational mathematics." I salute in passing the memory of Bachet de Méziriac, author of *Problèmes plaisants et délectables qui se font par les nombres* (1612—not, as Larousse says, 1613), and one of the first members of the French Academy. Let us also remember that the calculation of probabilities was at first nothing other than an anthology of "diversions," as Bourbaki states in the "Notice Historique" of the twenty-first fascicle on Integration. And likewise game theory until von Neumann.

François Le Lionnais foresaw the same problem and attempted to defuse it in the "First Manifesto," employing a judicious (and entirely characteristic) mixture of humor and polemic: "A word at the end for the benefit of those particularly grave people who condemn without consideration and without appeal all work wherein is manifested any propensity for pleasantry. When they are the work of poets, entertainments, pranks, and hoaxes still fall within the domain of poetry. Potential literature remains thus the most serious thing in the world. Q.E.D."

But this aspect of Oulipian poetics cuts far deeper than either Queneau or Le Lionnais suggests. At its heart is the belief that play is central to literature and, in a broader sense, to the aesthetic experience; in this, Oulipians fervently concur with Johan Huizinga, who asserted that "all poetry is born of play," extending his argument from poetry to culture itself. And play they do, as often as not with the tropes of their own discourse: the forbidding Oulipian "arsenal" of literary structures alluded to previously becomes in Le Lionnais the "Institute for Literary Prostheses," a charitable institution (and thus an entirely logical annex of the *ouvroir*) devoted to helping congenitally handicapped authors or those unlucky enough to have been maimed in the literary wars. This, then, is the attitude they adopt toward their own enterprise, an attitude whereby, through recourse to irony and humor, the temptations of self-sufficiency are resolutely kept at bay. A definition proposed by the group in its early days illustrates this attitude nicely, and will perhaps serve as a convenient point of conclusion for these introductory remarks:

Oulipians: rats who must build the labyrinth from which they propose to escape.

Raymond Queneau

The Foundations of Literature
(after David Hilbert)

Translated by Harry Mathews

Bibliothèque Oulipienne
Nº 3

After attending a lecture in Halle by Wiener (not Norbert, obviously) on the theorems of Desargues and Pappus, David Hilbert, waiting in the Berlin station for the train to Koenigsberg, murmured pensively: "Instead of points, straight lines, and planes, it would be perfectly possible to use the words tables, chairs, and tankards." This reflection gave birth to a work that appeared in 1899, *The Fundamentals of Geometry*, in which the author established in definitive (or provisionally definitive) fashion the axiomatic system of Euclidean geometry (and of several others besides). Taking this illustrious example as my model, I have here set out an axiomatic system for literature, respectively replacing the expressions "points," "straight lines", and "planes" of Hilbert's propositions with

"words," "sentences," and "paragraphs."

For some time now a translation of *The Fundamentals of Geometry* has been available in English (Open Court, Townsend, New York, 1950); the reader can easily refer to the original formulations. It should be noted that Hilbert presents five groups of axioms: those of connection, order, parallels, congruence, and continuity.

FIRST GROUP OF AXIOMS (axioms of connection)

I, 1 — *A sentence exists containing two given words.*

COMMENT: Obvious. Example: given the two words "a" and "a," there exists a sentence containing these two words — "A violinist gives the vocalist her a."

I, 2 — *No more than one sentence exists containing two given words.*

COMMENT: This, on the other hand, may occasion surprise. Nevertheless, if one considers the words "years" and "early", once the following sentence containing them has been written, namely "For years I went to bed early," clearly all other sentences such as "For years I went to bed right after supper" or "For years I did not go to bed late" are merely pseudo-sentences that should be

rejected by virtue of the above axiom.

SCHOLIUM: Naturally, if "For years I went to bed right after supper" is the sentence written originally, "For years I went to bed early" becomes the sentence to be excluded by virtue of the axiom I, 2. In other words, no one can write *A la recherche du temps perdu* twice.

I, 3 — *There are at least two words in a sentence; at least three words exist that do not all belong to the same sentence.*

COMMENT: Thus there are no one-word sentences. "Yes," "No," "Hey," "Psst" are not sentences. In regard to the second part of the axiom: the implicit assumption is that the language used comprises at least three words (a truism in the case of French and English) and furthermore that the possible existence of a sentence comprising all the words in a language (or all words less one, or less two) is excluded.

I, 4a — *A paragraph exists including three words that*

do not all belong to the same sentence.

COMMENT: A paragraph consequently comprises at least two sentences.

It is to be noted that the manner in which the axioms I, 1 through I, 4 are formulated contradicts axiom I, 2, since all four require for their articulation the words "words" and "sentences" whereas, according to the said axiom, no more than one sentence containing them should exist.

It is therefore possible to formulate the following metaliterary axiom:

Axioms are not governed by axioms.

I, 4b — *Every paragraph contains at least one word.*

COMMENT: Therefore "Yes," "No," "Hey," "Psst," which according to I, 3 are not sentences, cannot by themselves constitute paragraphs.

I, 5 — *Not more than one paragraph exists containing three words that do not belong to the same sentence.*

COMMENT: As in I, 2, the question of

unicity is thus raised, here that of the paragraph. In other terms, if three words that do not belong to the same sentence are used in one paragraph, they cannot be reused in another paragraph. But what if — as may be objected — they all belong to the same sentence in the other paragraph? An impossibility, according to this axiom.

I, 6 — *If two words in a sentence belong to a paragraph, all words in the sentence belong to the paragraph.*

COMMENT: No comment required.

I, 7 - *If two paragraphs have one word in common, they have still another one in common.*

COMMENT: To comply with this axiom, a writer must, if in a new paragraph he uses a word that has already appeared in the preceding paragraph, obligatorily use a second word that has appeared in the preceding paragraph as well. The obligation is easily acquitted in the case of such words as articles, auxiliary verbs, etc.; it is clearly anti-Flaubertian in regard to signifiers (nouns

and adjectives, for example).

(See the comment on theorem I.)

I, 8 — *At least four words exist that do not belong to the same paragraph.*

COMMENT: This means that a "text" consisting of a single paragraph does not deserve the designation "text"; that, furthermore, the language (French, English) contains sufficient words (four at least).

(See as well the comment to I, 3.)

In commenting on axiom I, 7, we did not explore all the consequences that can be drawn from it (as well as from other axioms already considered). We introduce forthwith the first theorem demonstrated by Hilbert:

THEOREM I. *Two discrete sentences in the same paragraph have at most one word in common; two discrete paragraphs either have no word in common or else they have one word in common and no word in common outside this sentence.*

COMMENT: If the two paragraphs have one

word in common, they must in fact have a second (I, 7); but in that case these two words determine the sentence and, according to I, 1, this sentence is unique. The two paragraphs therefore have one sentence in common.

We thus come back to a more Flaubertian conception. The repetition of a word already used in a preceding paragraph requires the repetition of the entire sentence — a crushing obligation. It is just as well — and far more prudent — to avoid any repetition of the word. Flaubert complies with this axiom scrupulously.

SECOND GROUP OF AXIOMS (axioms of order)

II, 1 — *If a word in a sentence is situated between two words taken in a particular order, it is also situated between them when these two words are taken in reverse order.*

COMMENT: A truism.

II, 2 — *If two words are present in a sentence, there exists at least one other word so situated that the second word appears between it and the first word.*

COMMENT: This may occasion surprise. The reader is requested to refer to the comments on theorems 3 and 7 for fuller insight into the question.

II, 3 - Of three words in a paragraph, one is situated between the two others.

COMMENT: A careful investigation of litera-

ture will unearth a few sentences to which this axiom does not apply — for example, in Chapter XCIII of *Tristram Shandy*.

II, 4 — Given three words in a paragraph that do not all belong to the same sentence; given a sentence that does not contain these words but belongs to the same paragraph; if the latter sentence contains a word of the sentence determined by two of the same words, it will always contain a word in common with the sentence determined by one of these words and the third.

COMMENT: To elucidate this axiom, let us go back to Hilbert, who formulates it "more intuitively: a straight line that enters a triangle exits from it as well" (p. 7 of the English translation).

We leave the reader the task of identifying or inventing paragraphs true to this axiom. Hilbert subsequently establishes several theorems, among them

THEOREM 3. Where two words are present, the sentence in which they appear includes at least one word between these two words.

And

THEOREM 7. Between two words of a sentence there exists an infinity of other words.

COMMENT: No doubt a reader surprised by axiom II, 2 will deem his surprised justified. To overcome his astonishment and understand these theorems he need only admit the existence of what we shall call, following the example of traditional projective geometry, "imaginary words" and "infinitesimal words." Every sentence contains an infinity of words; only an extremely limited number of them is perceptible; the rest are infinitesimal or imaginary. Many thoughtful minds have had a premonition — but never a clear awareness — of this. No longer will it be possible for students of rhetoric to ignore so crucial a theorem. Linguistics may benefit from it as well.

AXIOM OF PARALLEL
: (Euclid's axiom)

Given a sentence and a word that does not belong to this sentence; in the paragraph determined by the sentence and the word, no more than one sentence exists that contains this word while having no word in common with the given sentence.

COMMENT: Given the sentence "For years I went to bed early," and the word "awakening," in the paragraph that includes them, there is one sentence and one only that contains the word "awakening" and no word belonging to the sentence "For years I went to bed early," namely: "This belief lasted a few seconds after my awakening." Thus the opening paragraph of *A la recherche du temps perdu* follows Euclid's axiom at least locally.

We leave to the reader the task of transposing the axioms of congruence and continuity.

The process of transposition might be pursued still further. Curiously enough, once the domain of conic sections is reached, there is no more need of transposition. We find ourselves immersed in rhetoric. There is no talk of anything but ellipses, parabolas, and hyperbolas, all figures of speech well known to writers, even if in our day ellipsis is rare, the parable has been neglected (for nearly two thousand years), and hyperbole is common coin.

also be aware that all ellipses in the translated texts are the authors' rather than mine.

Granted that the purpose of the collection is to acquaint the Anglophonic reader with the principal aspects of Oulipian poetics, most of the texts herein deal with literary theory. Another consideration conditioning this choice derives from the Oulipo's own insistence on rigorous form: if their theory does lead to practical demonstrations, the texts of this sort resist translation in a way that the theoretical texts do not. Think, for example, of the problems posed by the translation of Harry Mathews's "Liminal Poem" from the original English into any other language. Still, texts like "Prose and Anticombinatorics," "The Relation X Takes Y for Z," "A Story as You Like It," and "The Theater Tree: A Combinatory Play" should furnish the reader with some idea of the sort of text that might result when a given aspect of Oulipian theory is applied.

Finally, and most important, in spite of any eventual infelicities that might otherwise be remarked, I hope the present collection will preserve for the reader that which has consistently nourished my own reading of the Oulipo: the pleasure of the text.

Harry Mathews

Liminal Poem

to Martin Gardner

O
to
see
man's
stern
poetic
thought
publicly
espousing
recklessly
imaginative
mathematical
inventiveness,
openmindedness
unconditionally
superfecundating
nonantagonistical
hypersophisticated
interdenominational
interpenetrabilities.
Harry Burchell Mathews
Jacques Denis Roubaud
Albert Marie Schmidt
Paul Lucien Fournel
Jacques Duchateau
Luc Etienne Perin
Marcel M Benabou
Michele Metalil
Italo Calvino
Jean Lescure
Noel Arnaud
P Braffort
A Blavier
J Queval
C Berge
Perec
Bens
FLL
RQ

Marcel Bénabou

Rule and Constraint

Constraint, as everyone knows, often has a bad press. All those who esteem the highest value in literature to be sincerity, emotion, realism, or authenticity mistrust it as a strange and dangerous whim.

Why bridle one's imagination, why browbeat one's liberty through the voluntary imposition of constraints, or by placing obstacles in one's own path? Even the most kindly disposed critics pretend to see in the use of constraint nothing more than a game, rarely innocent but fundamentally vain. The only merit that they might accord to it is that it provides, for a few linguistic acrobats, for a few verbal jugglers, the circus in which they may display their virtuosity. All the while regretting, of course, that so much ingenuity, work, and eagerness had not been placed in the service of a more "serious" literary ambition. *Difficiles nugae*, as was generally said even in the last century of anagrams, palindromes, and lipograms, in order to stigmatize them, these venerable exercises whose antiquity and persistence in the corpus of European literary traditions ought to have preserved them from sarcasm and banter. And even today, there are undoubtedly certain learned dons in whose eyes neither the Alexandrian poets, nor the Grands Rhétoriqueurs, nor the poets of the German Baroque, nor the Russian formalists will ever find grace. In the name, of course, of the sacrosanct liberty of the artist, which nothing must shackle; in the name of the imprescriptible rights of inspiration.

Certain types of constraint, however, seem to have escaped from this discredit. For four centuries, we have been very comfortable, apparently, with the laws of prosody—with the fact, for instance, that an alexandrine has twelve syllables, that a sonnet has fourteen lines, whose rhymes are disposed according to a very precise order. And we do not hesitate to admire in Malherbe or Valéry the scrupulous respect of a demanding canon. In fact, it is rather difficult, except for proponents of "automatic writing," to imagine a poetics that does not rely on rigorous rules and, more generally, a literary production that does not involve the use of cer-

tain techniques. Even the most rabid critics of formalism are forced to admit that there are formal demands which a work cannot elude. Responding to those who were trying to confound inspiration, liberty, chance, and the dictates of the unconscious,¹ the terms that Raymond Queneau employed in 1938 are well known: ". . . inspiration which consists in blind obedience to every impulse is in reality a sort of slavery. The classical playwright who writes his tragedy observing a certain number of familiar rules is freer than the poet who writes that which comes into his head and who is the slave of other rules of which he is ignorant" (*Le Voyage en Grèce*, p. 94).

Now it is actually in the passage from the *rule* to the *constraint* that the stumbling block appears: people accept the rule, they tolerate technique, but they refuse constraint. Precisely because it seems like an unnecessary rule, a superfluous redoubling of the exigencies of technique, and consequently no longer belongs—so the argument goes—to the admitted norm but rather to the process, and thus is exaggerated and excessive. It is as if there were a hermetic boundary between two domains: the one wherein the observance of rules is a natural fact, and the one wherein the excess of rules is perceived as shameful artifice.

It is precisely this boundary, wholly arbitrary, that must be challenged in the name of a better knowledge of the functional modes of language and writing. One must first admit that language may be treated as an object in itself, considered in its materiality, and thus freed from its subservience to its significatory obligation. It will then be clear that language is a complex system, in which various elements are at work, whose combinations produce words, sentences, paragraphs, or chapters. Obviously, nothing prevents us from studying the behavior, in every possible circumstance, of each of these elements. On the contrary: it is only in this manner that experimental research into the possibilities of language can proceed. And the role that may be assigned to constraint immediately becomes apparent: to the extent that constraint goes beyond rules which seem natural only to those people who have barely questioned language, it forces the system out of its routine functioning, thereby compelling it to reveal its hidden resources.

Constraint is thus a commodious way of passing from language to writing. If one grants that all writing—in the sense both of the act of writing and of the product of that act—has its autonomy, its coherence, it must be admitted that writing under constraint is superior to other forms insofar as it freely furnishes its own code.

All these obstacles that one creates for oneself—playing, for example, on the nature, the order, the length, or the number of letters, syllables, or words—all these interdictions that one postulates reveal their true func-

tion: their final goal is not a mere exhibition of virtuosity but rather an exploration of virtualities.

The work of Georges Perec furnishes an exemplary demonstration of everything that concerns so-called "literal" constraints. As a matter of fact, in Perec one notes a sort of fascination for the letter. Conscious that, to quote J. Roubaud's beautiful expression, "each page is a bed where letters lie," Perec produced several of his texts through diligent work on letters: on their presence, their absence, their repetition, their order of occurrence in words, or even their form. Thus, the exclusion of a vowel engenders an extraordinarily rich novel whose functioning is entirely governed, down to the last detail, by the consequences of this *disappearance*.² The inverse constraint, which consists in using *only* the vowel *e*, presides at the birth of exceedingly strange festivities at the bishop's palace in Exeter, involving the derangement of senses and sexes (*Les Reverentes*). And it is on still another literal constraint that are based the vertiginous variations which fill the two collections *La Clôture* and *Alphabets*, that of the heterogram: each verse employs the same set of different letters, whose permutations produce the poem. Not without humor, Perec sees in this play of constraints the beginning of a new poetic art, capable of replacing the rhetorical vestiges still in use in most modern and contemporary poetic production.

It is useful to note in passing, nonetheless, that the petition of bankruptcy of traditional rhetoric had been filed, in less temperate terms, by a contemporary poet: "Rhetoric, why should I recall your name? You are no longer anything but a colonnaded word, the name of a palace which I detest, from which my blood has forever banished itself" (F. Ponge, *Méthodes*, pp. 182-83).

In progressing from the letter to the word, the techniques of Raymond Roussel inevitably come to mind, and his way of exploiting to the limit the evocative power of the word he chooses: sometimes it is the dislocation of an utterance; sometimes the bringing together of a given pair of words that creates an object (imaginary), described with the utmost precision; an event (wholly as imaginary) recounted in minute detail. The unforgettable *rails en mou de veau*, which so impressed the first readers of *Impressions d'Afrique*, is only the most striking example of this aptitude of language in creating myths. Roussel, like Mallarmé, elaborates from the sole lexicon his own universe; and from the arbitrary choice he imposes upon himself, he brings into being a second nature.

This paradoxical effect of constraint, which, rather than stifling the imagination, serves to awaken it, can actually be explained very readily. The choice of a linguistic constraint allows one to skirt, or to ignore, all these other constraints which do not belong to language and which escape

from our emprise. Michel Leiris seized this point perfectly, regarding the method used by Raymond Roussel, of whom he said: "His voluntary subjugation to a complicated and difficult rule was accompanied, as a corollary, by a distraction regarding all the rest, leading to a raising of the censure, the latter being far better skirted by this means than by a process such as automatic writing. . . . Juggling apparently gratuitous elements, in which he himself trusted, he created true myths, insofar as they are all very authentically symbolical" (*Brisées*, pp. 59-60).

Thus, it is not only the virtualities of language that are revealed by constraint, but also the virtualities of him who accepts to submit himself to constraint.

Curious reversal: here, we are far from the wise praise of classicism toward which these few remarks seemed at first to be directed. In fact, one must examine how things really come about.

Rules, so cherished by the classics, were principally used as a means of channeling eventual overflowings of a poorly controlled verbal flood. Valéry could thus, in his lecture on poetics at the Collège de France on 10 December 1937, say of the rules of traditional prosody that they are "like waves," and that "vague ideas, intuitions, impulsions comb therein."

Linguistic constraints, for their part, granted their arbitrary exigencies, directly create a sort of "great vacuum" into which are sucked and retained whole quantities of elements which, without this violent aspiration, would otherwise remain concealed.

It is thus the paradox of writing under constraint that it possesses a double virtue of liberation, which may one day permit us to supplant the very notion of inspiration. We recall, once again, the fundamental remarks of R. Queneau on this theme: ". . . it must be noted that the poet is never inspired, if by that one means that inspiration is a function of humor, of temperature, of political circumstances, of subjective chance, or of the subconscious. The poet is never inspired, because he is the master of that which appears to others as inspiration. He does not wait for inspiration to fall out of the heavens on him like roasted ortolans. He knows how to hunt, and lives by the incontestable proverb, 'God helps them that help themselves.' He is never inspired because he is unceasingly inspired, because the powers of poetry are always at his disposition, subjected to his will, submissive to his own activity . . ." (*Le Voyage en Grèce*, p. 126).

Since its creation in 1960, the Oulipo has endeavored to explore, to inventory, to analyze the intimate processes and resources of the language of words, of letters. This exploration is naturally based on the use of constraint, either through the use of ancient constraints pushed to the far limit of their possibilities, or through systematic research in new constraints. Recourse to the axiomatic method, the importance of mathemat-

OPERATIONS	DISPLACEMENT	SUBSTITUTION	ADDITION	SUBTRACTION	MULTIPLICATION (repetition)	DIVISION	DEDUCTION	CONTRACTION
LINGUISTIC OBJECT								
LETTER	anagram palindrome pig Latin metathesis	paragram (printer's error) cryptography	prosthesis epenthesis paragoge	abbreviation aphaeresis syncope elision lipogram belle absente constraint of the prisoner	tautogram			acrostic acronym signet chronogram
PHONEME	phonetic palindrome spoonerism Rrose Sélavy (Desnos) glossary (Leiris)	à-peu-près alphabetical drama	stuttering	lipophoneme	alliteration rhyme homoeoteleuton			
SYLLABLE	syllabic palindrome spoonerism		javanese stuttering gemination echolalia	haplography liposyllable (Precious [con]straint) shortening	stuttering alliteration rhyme	diasesis	acronym	

WORD	Mathew's Algori-thm permutations (Lescure) word palindrome inversion	metonymy S + 7 homosyntax- ism L.S.D. translation antonymic translation	redundance pleonasm	liponym La Rien que la Toute la (Le Lionnais)	epanalepsis pleonasm anaphora defective rhyme	"de-portman- teau word" etymology tmesis	haikuization	portmanteau word
SYNTAGMA	reversion inversion anastrophe	perverbs (Ma- thews) proverbs aphorism homophony untraceable locutions	interpolation encasement	ellipsis brachylogia zeugma	reduplication	Rousselian procédure (phonic dislo- cation) bendiadys	proverbs on rhymes edges of poem	syntagmatic amalgam (Doukipu- donktan)
SENTENCE	Mathew's Al- gorithm	homophony holorhyme	tireur à la ligne larding	coupeur à la ligne	leitmotif refrain	dislocation	citation tireur à la ligne collage	
PARAGRAPH	Mathew's Al- gorithm		tireur à la ligne	censure			plagiarism anthology	résumé

ical concepts, the utilization of combinatorics are the principal paths of this research.

The Oulipo of course does not seek to impose any thesis; it merely seeks to formulate problems and eventually to offer solutions that allow any and everybody to construct, letter by letter, word by word, a text. To create a structure—Oulipian act *par excellence*—is thus to propose an as yet undiscovered mode of organization for linguistic objects.

The accompanying table offers a systematic and analytic classification of elementary linguistic and literary operations; it is complementary to the table elaborated by R. Queneau in 1974, which appears in *Atlas de littérature potentielle* (pp. 74–77) under the title, “Classification of the Works of the Oulipo.”

The intent of my table is to try to assign a place within a given ensemble to as many linguistic manipulations as possible, with neither generic distinction nor hierarchy. Therein are included Oulipian and pre-Oulipian constraints, as well as popular verbal games and figures of classical rhetoric.

In order to elaborate this table, the various linguistic objects susceptible of manipulation first had to be isolated, from the simple to the complex: the letter (or typographic sign), the sound, the syllable, the word, the group of words (or syntagma), the sentence, the paragraph. The table stops at the paragraph, but nothing would prevent us, of course, from working on the page, the chapter, the book, even the library. . . .

Next, the various operations to which the linguistic objects may be submitted had to be identified. For the time being, eight have been isolated: displacement, substitution, addition, subtraction, multiplication, division, deduction, contraction. But it is certain that other means of identifying and naming these sorts of operations are possible. Thus, for example, in his general theory of rhythm, J. Roubaud postulated the following categories: concatenation, imbrication, encasement, encroachment, permutation, effacement, parenthesage.

Granted that the table seeks to account for the thousand and one means of arranging language, there can be no question of giving a concrete illustration for each line here. Definitions and examples may be easily found in consulting, on the one hand, *Atlas de littérature potentielle*, and, on the other, B. Dupriez's dictionary, *Gradus: Les procédés littéraires* (Paris: Union Générale d'Éditions, 1984).

General Table: The Three Circles of Lipo³

III	
displacement	
II	
character	
I	
letter	
substitution	
décor	
phoneme	
deduction	
event	
syllable	
contraction	
place	
word	
intrication	
duration	
syntagm	
addition	
sensation	
sentence	
subtraction	
emotion	
paragraph	
multiplication	
thought	
page	
division	
memory	
chapter	

I: Circle of linguistic objects

II: Circle of semantic objects

III: Circle of operations

CLOCKING THE WORLD ON CUE: THE CHRONOGRAM FOR 2001

NOTE: The chronogram — a centuries-old literary form — follows a simple but demanding rule: when all letters corresponding to Roman numerals (*c*, *d*, *i*, *l*, *m*, *v*, and *x*) are added together, they produce a sum equivalent to a specific year of the Christian calendar. The single words *memory* and *memento* are thus chronograms of the year 2000 (*m* x 2); so are *A moment for feasts & prayers* (*m* x 2) and *A year to pay homage to the dead* (*m* x 1 + *d* x 2). Both the title and text of this work are examples of chronograms of the current year.

January starts: sun here, stars there. So what joys & fears has the New Year brought us?

- In the Irkukst penitentiary ironworks the night shift is finishing its stint, skirting weighty pig-iron ingots as it regains the prison interior.
- In Pienza, Ernestina is heating tripe *fiorentina* for thirteen.
- In Sing-Sing, wearing surreptitious attire, spiting the surprising North Irish negotiations & shrinking tensions, Phineas, retiring Bishop of Ossining, with the authorities' requisite inattention, is to-night anointing fifteen Fenian ("Fighting Irish") priests in a rite of injurious piety.

- Bibi is stirring pigeon eggs in Saint Étienne.
- In Brighton, gregarious Brother Ignatius is getting high quaffing his fifth straight Irish whisky.
- In Pretoria, gritty Erwin Higginson (age eight), ignoring fatigue & injuries, is winning his point in a bruising nineteen-eighteen tiebreaker against Fritz Spitzfinger (age nine) by returning a wristy spinner hip-high & without hesitation whipping it fair, Spitzfinger then batting it high into the rows to bring the fifteenth prestigious Witherspoon Tennis Initiation Tourney to a breathtaking finish.
- In Fuji, pursuing a hashish high with Quentin, Kenny is perusing sporting prints by Hiroshige & Hokusai.
- Arising at eight in Brisbane, Ian, aspiring historian of propitious intuitions, enjoys the benign aberration that, by getting a grip on his utopian fusion of Augustinian with Einsteinian reasoning, he is attaining a genuine gnosis.
- In Etrurian Tarquinia, Gigi is eating spaghetti with pepperoni.
- In Austria, zipping past the Inn, ignoring warning signs, Pippo Peruzzi, first-string Ferrari whiz, big winner in Spain & Argentina, is steering his touring bike (pistons & turbine whirring, its stunning furnishings genuine Pinin-Farina) in brisk pursuit of fiery Zizi, his Hungarian skier, itinerant antithesis, antagonist, tigress, priestess, siren, obsession, happiness, wife.
- Bobbie is sitting with Bert in a Parisian bistro, in whose noisy interior untiring opportunists are satisfying pretentious ninnies with inferior white wine.
- Heroin originating in Iquitos is winning first prize with tertiary bargaining arbitrators in Tijuana.
- Bonnie is frying onion rings in Triffin (Ohio).
- In antique Poitiers, Antoinette is refreshing her guests with

- interpretations of Rossini's quainter offerings, interspersing arias & ariettas with his "Nizza" (singer & piano), his "Raisins" & "Noisettes" (piano), his first *sinfonia* (strings), & his roguish "Iphigénie" (bass trio).
- In Tirana, inept Hussein is paying fifty-eight qintars to fortify his Istrian wine with Bosnian raki.
 - In the wintry outskirts of Pori, Father Tiki Haakinen — enterprising & itinerant Finnish priest — is repairing hi-fi wiring for a parish benefit.
 - In spite of its threat to her ingratiating Gibson waist, Rikki, in Zanzibar, is insisting on heaping & eating piggish portions of spaghetti & fig pie.
 - Postponing inopportune issues & putting first things first, Kiwanis, Rotarians, & Shriners are putting their agonizing unity in writing, signing a proposition that reasserts their opposition to atheists, bigotry, euthanasia ("outright assassination"), heroin, pinkos, the Spanish Inquisition, superstition, & unfairness in business arbitration.
 - Fate, or perhaps the outrage of one hurt spirit, separates father & son for many years of harsh regret.
 - In Antibes, binging on *pastis* is getting Winnie higher than nine kites.
 - In Kiruna, in white tie, sipping a Perrier, Fafnir Grieg, high priest of Ibsen initiates, is testing his register & intonation in painstaking preparation for his fiftieth signature interpretation of the protagonist in *Ghosts*.
 - In Gorizia, Anita is working up an appetite for *anitra triestina* ironing sheets.
 - At Trinity, Robin is boating with his tutor, Isaiah Singe. Isaiah is asking if Robin thinks he is going to finish his thesis (*Affinities with*

the Orient: Inquiries into spurious interpretations of Hafiz in Ariosto, Ossian & Kropotkin) within his transitory span of years.

- In Bingen, penurious Winston is spiking his uninspiring Pepsi with Steinhäger.

- Business-wise Erika O'Higgins is sitting in Pittsburgh squinting with attention at the infuriating fine print in an IRS opinion assigning Irish pension benefits she is repatriating. The opinion questions her attestation separating foreign benefits, earnings as insurer in Tangier & those in fringe proprietary rights in Eritrea; pinpoints gains transpiring through inquiries into unwritten but propitious negotiations in Haiti; & reinstates profits inherent in eight-figure operations she is authorizing in Bisk (Siberia).

- In Bonaire (Georgia), hungry Josiah is weighing into his piping-hot grits & grunts.

- Rehearsing *Rienzi* in her Gorki isba, Anastasia thinks of Patti singing in *I Puritani*, of Kipnis in *Boris*, of Kiri Te Kanawa's Rosina in a Göttingen *Figaro*.

- In Ostia, engaging Ethiopian waiters trigger big tips by squirting nips of *grappa* into porringers of out-of-season fruit.

- Batting against the Orizaba Tigres in Irapuato, rookie Juanito Arias first whiffs in eight straight opportunities before hitting a ninth-inning zinger & satisfying the inhabitants' hopes of winning the Zapatista Series.

- Zazie is biting into rabbit thighs in Barbizon.
- Zenia, passionate Aquinist, is pursuing an ingenious hypothesis, assigning the origins of Aquinas's interpretations of Gorgias to an "Osirian" genesis arising in the writings of inquiring Egyptian priests, an origin that the Sophists reinstate, or so Zenia infers in her ingenious synthesis. Questioning the suppositions of post-Aquinist

thinkers, Zenia insists on the inferiority of Fourier's "inanities," Wittgenstein's "gibberish," & Austin's "asininities."

- High-intensity spirits inspire high-intensity spirit in noisy Kirin.

- In an uninspiring quarter of Trier, Ohioan Josiah, a boisterous nineteen, is infuriating Swiss Inge, a serious thirty, by persisting in attributing the first apprehension of the Einstein shift to Igor Sikorsky.

- In a *ristorante* in Torino, sheepish Antonio's superstitious hesitation between *arrabiata* spaghetti & risotto with *funghi* both intrigues & irritates patient Giorgia.

- In Ottawa, thirteen Inuit Situationists are signing treaties with the nation's highest authorities guaranteeing that their tribes & regions inherit proprietary herring-fishing rights outright & in perpetuity.

- In Whitby, seagoing Einar, finishing his fifteenth pink gin, insists he is quite fine.

- In Twinsburg (Ohio), when a nitwit intern, threatening to irrigate her intestines with his "own unique quinine infusion," brings out a giant syringe, Queenie, a patient with hepatitis B, her weary inertia shattering at the threat of this aggression, begins reiterating in shrieks of irritation & anguish, "No penetration without representation!"

- Ski-touring in Bennington, Jiri spits out bits of unripe kiwi in a fit of pique.

- Supine in Biarritz, Tristan — unsparing onanist — is perusing Gautier's pornographies, whose swift prurient inspiration stiffens his wanling spirits.

- In Rosario (Argentina), fiery Antonio is assuaging his thirst with sweetish Rhine wine.

- Ianthe, in Berkshire, is initiating with requisite ingenuity her

inquiry into "Oppositions & affinities in the autobiographies of Gibbon, Twain, & Frank Harris."

- In the Ain, Fifi is eating pike patties.
- In their frigate-repair station in Hawaii, engineer's assistant Rossetti is preparing to assassinate his superior, Ensign Fink, for gratuitous insinuations about his inferior IQ.
- Anisette fizzes are winning the night in Springs, whither Henri is steering Bettina in his antique Hispano-Suiza.
- Rehearsing Griffith's reinterpretation of the *Oresteia*, Saint Rita is pursuing Sinatra — a horrifying Aegistheus — then knifing Frank in his upstairs bathing unit. Arguing about the Patrappassian & Arian heresies, Ignatius, Athanasius, & Boethius irritate an otherwise patient Hypatia. Portia is propositioning Iago. Tweetie, Isaiah, & Sophie Goering are intoning Britten's (or is it Griffin's?) "Fair Oriana." With Thisbe furnishing her know-how to position the pair, King Henry the Fifth is trying to insert his uninteresting penis into a twittering Titania. The White Rabbit appraises Pippa passing with irony and pity.
- In Saint-Quentin, Pierre is into his fifth pinkish Pinot Noir.
- Writing *finis* to his reign in the prize ring in Ashanti, Nigeria, "Tiger" Titus (Niger) is forfeiting a bruising fist fight to his Ibo heir, Tobias, thus ratifying his apparent superiority.
- In a quaint inn in Rieti, Kiki & Brigitte sniff quasi-appetizing brain fritters hissing in swine fat.
- Fishing in Touraine, Irwin is unkinking Eugenia's rig & fitting it with spinners. Their skiff sits in a quiet bight where feisty, spiky pike are rising & biting. First strike! It is raining.
- Uriah, Iggi, Jennifer, Tabitha are hitting the Pinot Grigio in a wine bar in Waikiki.

• In Fife, Inigo Higgins finishes writing his iniquitous *Jottings on Kinship Etiquette in Barrie, Rattigan, Braine, & Pinter*.

- Gauging his position in the whitening Pakistani heights, Piotr eats his fiftieth fig out of its tin.
- Its gregarious parties gathering at a transient staging-point, shipping in the Bering Straits, either freight or passenger, is stationary tonight — engines quiet, neither jib nor spinaker astir. As the fortieth ship nears, persistent skiffs begin sprinting through the nippy waters, swapping ostentatious rations & surprising potations & ferrying a rotation of seafaring prostitutes out of Tientsin, Biak, Iquique, Teresina, Kauai, Tenerife, Piraeus, & Hoboken.
- In Whitefriars, Pip infers that he is gaining genuine insights by sharing a firkin of Guinness with Brian.
- In Perugia, unwise Arrigo Panin is preparing a presentation that, straining notions of affinities to their breaking-point, risks irking (or boring) knowing trainees in his Institute for Insight & Orientation by arguing that it is appropriate to attribute Hopkins's inspiration to Whittier, Stein's to Browning.
- Faith is refrigerating nineteen stingers & braising nine satiating portions of bison brisket in Topperish (Washington).
- Hiking in the interior of Shikoku, Kirk is sustaining a tiring Iris with aspirins & interesting attributions of Finnegan's epiphanies.
- Sophie & Étienne, in an Iberian setting, are swigging refreshing pints of sangria *gratis*.
- In Sabine, righteous Sheriff Winthrop Prior, feinting a right, is banging a furious fist into a hirsute rapist's ribs & a punishing thigh into his iniquitous groin.
- Georgianna is nourishing nine aging kittens in Big Sur.
- Benign skies in Arizona. At a prairie spring, Tintin is watering

his proprietor's thirty-eight first-string ponies — they're skittish ponies, stirring, neighing, biting, nosing bitten withers. Rising high in his stirrups, reins tight against bit, quirt hanging at his wrist, Tintin spits; sitting, he tips a sparing ration into its Zigzag wrapping. Prairie rabbits thinking: rain. Harriers beating their wings in thin bright air. Tintin thinking: this night's attire — white shirt, string tie — is right for winning his engaging señorita. His pinto whinnies & pisses.

- Sipping saki in Gifu, Roshi is getting quite tipsy.
- Zigzagging in nifty figure eights on a skating rink in frosty Keewatin, Nettie is fantasizing an ingenious haikuisation of Swinburne's "Proserpine."

- In Pistoia, tiny Pierino, stripping a thin bit of appetizing skin off the shining ribs of a spit-roasting pig, bites into it with a grin.

- Within sight of eternity, Keith Asquith, wintering in Antigua, is taking unsparing pains to surprise, spite, & punish his nowise ingratiating Yorkshire heirs — "The shits!"

- In Iowa abstainers are abstaining.
- In Austin, Ira & Justina, a striking pair, registering at first sight no antipathies but intriguing affinities, wishing to kiss, interiorize their inhibitions, banish their hesitations, skip propositions, & kiss, hip against hip. A swift shifting into a pertinent interior to quit their attire: whipping off pigskin trainers, unbuttoning Ira's shirt, stripping off Justina's T-shirt, unzipping her tight-fitting skirt & his khakis, unhooking her brassiere, ripping away panties & briefs, ignoring trinkets, skin to skin. . . . "Wait," interrupts Justina, insisting, "first this joint," to forthwith initiate brisk intakes & an instantaneous high. Kissing again, Ira's fingertips graze with finesse Justina's hair, ribs, & thighs. Justina seizes his wrists & entwines his waist between jittering tibias. Straining, Ira nips her tits. Thrashing, her nips stiffening,

Justina tightens her grip. Gratifying Justina's appetite for kissing with ingenious bites, in his benign yearning Ira using his weight tips her posterior hither, baring Justina's piping fig. Into this engaging shrine Ira insinuates his inspissating thing, an insertion that ingratiates writhing Justina, inquiring in its penetration of her gripping, shifting pith, whose stunning twinges infuse Ira with stinging fire. He begins panting, his sinews stiffen, he hisses, Justina shrieks. It's brief, it's nifty, it's insane. Supine & sweating, Ira & Justina sigh faint sighs, kiss, grin, & sink into unworrying, transitory night.

- In the Tsinking zoo, unhesitating hippos, giraffes, kiwis, penguins, tortoises, porpoises, & tigers are ingesting big propitiatory portions of grain, onions, fruit, ginger, fish, & pig.
- On Thirteenth Street & First, Antoine & Honoria are sharing a pizza & a knish.
- Aries & Sirius are shining in Tunisian skies,

& so our New Year has begun.

~~CALCULATED FICTION — START HERE~~

Oulipian practice is understood here as being preformalized, though admitting of a descriptive systematic; but at the same time the possibility of a formal syntax is foreseen, of a "foundation" from which the practical, thus "naive," procedure would be shifted toward an activity of "models."

14. Proposition 9: Oulipian work is amusing. Here again the reference is obviously of mathematical order: *"Let us remember that topology and theory of numbers sprang in part from that which used to be called 'mathematical entertainments,' 'recreational mathematics' . . . that the calculation of probabilities was at first nothing other than an anthology of 'diversions,' as Bourbaki states in the 'Notice Historique' of the twenty-first fascicle on Integration."²⁹*

This means that Oulipian work is regarded as fundamentally innovative, as being situated on the cutting-edge, that it cannot avail itself of any so-called serious finality of any of the criteria serving today in scientific domains to eliminate research that unduly jostles accepted perspectives, this on behalf of existing smoothly functioning machines. Where the criteria are: What good is it? Who guarantees it? What problem does it solve? That it enters thus inevitably into the category of "play." It may be noted that Queneau does not refuse this often intentionally pejorative (in the case of those who distribute the labels) marginalization of the Oulipo.

Indeed, it is clear that one cannot respond to the question of "utility" or to that of "seriousness" if one is not already both useful and serious (and thus incapable of posing oneself that question); that at the same time it is not necessary to affirm this seriousness, this utility, as an unverifiable postulate.

15. Proposition 10: Oulipian work is craftsmanlike. Queneau's commentary seems here to mask something: ". . . this is not essential. We regret having no access to machines." I would take it in a slightly different manner, and machines would be irrelevant. It seems to me, according to the status implied by propositions 9 and 10 (and Queneau's own positions, enumerated in propositions 1 to 7), that it is a case of a trait which is, on the contrary, essential. The claim to craftsmanship reflects an affirmation of amateurism; it is a voluntary archaism (and perhaps, here again, an anticipation).

16. One will not be surprised to find, then, that the Oulipians, in their Oulipian work, whether they be mathematicians or not (or "and not"), very generally satisfy the conditions of propositions 8, 9, 10: this is *proposition 11*.

17. CONSTRAINT. The Oulipo's first manifesto introduces, in opposition to "inspiration," the Oulipian operative concept of constraint—"Every literary work begins with an inspiration (at least that's what its author suggests) which must accommodate itself as well as possible to a series of constraints and procedures that fit inside each other like Chinese boxes. Constraints of vocabulary and grammar, constraints of the novel . . . or of classical tragedy . . . constraints of general versification, constraints of fixed forms (as in the case of the sonnet), etc."³⁰—and proposes as one of the Oulipo's goals the search for constraints in ancient or in contemporary, though non-Oulipian, works (anticipatory or synchronous plagiarisms): this is *anoulipism*; the putting into play of these or new constraints in Oulipian works is *synthoulipism*. The status of constraint is thus fundamental. It should be noted that it is not posed as being a priori different from that of constraints elaborated by tradition, as the first manifesto clearly demonstrates.

18. *Let us choose, for example* (Queneau himself, who alludes to it first in his paper on potential literature,³¹ invites us to do so), *the lipogram*: a lipogrammatic text is a text wherein is lacking, for whatever reason, one or more letters of the alphabet used to write it (generally, letters of alphabets *not* used in writing the text will be lacking also). This constraint, which goes back to most ancient antiquity, presents most rigorously the qualities Queneau insisted on for the Oulipian text, which we presented above (propositions 8, 9, 10 of sections 13 to 15): it is naive, amusing, craftsmanlike; most important, a great Oulipian virtue:

Proposition 12: A good Oulipian constraint is a simple constraint.

"The suppression of the letter, of the typographical sign, of the basic prop, is a purer, more objective, more decisive operation, something like constraint degree zero, after which everything becomes possible."³²

19. *The lipogram*, abundantly pre-Oulipian (and undoubtedly per-) through various plagiarists, became Oulipian with the publication of *La Disparition*, a novel by G. Perec:³³ "qui, d'abord, a l'air d'un roman jadis fait où il s'agissait d'un individu qui dormait tout son saoul."³⁴

In what does the Oulipization of this constraint, as old or almost as old as the alphabet, consist? In this, which is a fundamental trait: that, as opposed to the different plagiarists who use the lipogram as a process of translation (Nestor of Laranda and the *Iliad*),³⁵ process of mnemotechnics, moral or metaphysical formulary . . . the constraint therein is at once principle of the writing of the text, its developmental mechanism, and at the same time the meaning of the text: *La Disparition* is a novel about a disappearance, the disappearance of the *e*; it is thus both the story

of what it recounts and the story of the constraint which creates that which is recounted. This highly involved aspect of constraint (which is undoubtedly not proper to Oulipian constraint, but which is in this case practically pure) is a direct consequence of the axiom of the Oulipian constraints, which may be formulated in the following manner:

Axiom: Constraint is a principle, not a means.

(This axiom has a corollary which we shall evoke further on: see 27.)

Moreover, *La Disparition* incorporates several e-lipogrammatic texts written by other Oulipians—in particular, this one (a- and e-lipogrammatic) by Queneau:

"*Ondoyons un poupon, dit Orgon, fils d'Ubu. Bouffons choux, bijoux, poux, puis du mou, du confit; buvons, non point un grog: un punch.*"³⁶

20. A methodical organization of constraints, resembling that which classifies the chemical elements (Mendelejeff's Table), and known as Queneleeff's Table, has recently been elaborated by Queneau.³⁷

The columns of the table classify the constraints, the lines classify the elements upon which they operate (the lipogram appears in column IV, line a).³⁸ This systematic classification brings out, as is only natural, several blank spaces, which must, through some sort of Oulipian alchemy, be filled. On the other hand, the table, prolonged by transquenellian elements, is in the process of being enlarged, and the new table will undoubtedly have an enumerable infinity of lines and columns.

21. ANTI-CHANCE. *Proposition 13:* The Oulipo's work is anti-chance.

Presenting *potential literature*, Queneau takes great pains to specify: "we are not concerned with . . . aleatory literature."³⁹

The intentional, voluntary character of constraint to which he insistently alludes time and again is for him indissolubly linked to this lively refusal of chance, and even more so to the refusal of the frequent equation of chance and freedom.

"Another entirely false idea in fashion nowadays is the equivalence which is established between inspiration, exploration of the subconscious, and liberation; between chance, automatism, and freedom. Now the inspiration that consists in blind obedience to every impulse is in reality a sort of slavery. The classical playwright who writes his tragedy observing a certain number of familiar rules is freer than the poet who writes that which comes into his head and who is the slave of other rules of which he is ignorant."⁴⁰

In this fundamental text (from 1938), the attack, of course, is on surrealism; for all of that, it is hardly less of current interest. This constant

attitude must be directly related, it seems to me, to the fascination always exercised on him by arithmetical series that imitate chance while obeying a law. In the article on *s*-additive series already cited,⁴¹ he remarks, about a series of this type previously studied by Ulam, “*it gives the impression of great ‘irregularity’*”; the finest example of this is obviously the series of prime numbers.⁴² The exemplary value of such series lay for him in the fact that it is a case of exorcised chance, since recognized as such, thus mastered insofar as possible. The refusal of “automatism” is thus for him in no way the rejection of mechanical procedures, but only of those that are mechanical merely through ignorance. Moreover, to the extent that all literature (like language) is subject to automatisms, he is irritated by the illusion of thinking that they may be avoided by simply deciding to act as if they did not exist: jamming, etc.; proposition 13 thus means the rejection of the mystical belief according to which freedom may be born from the random elimination of constraints.⁴³

22. I will now take two Oulipian examples that are situated in this perspective: the *Sonnets irrationnels* by Jacques Bens,⁴⁴ and *Mezura*.⁴⁵

In each case the sequence of the decimals of the number π , an example of this acknowledged and thus tamed chance, is given as constraint, on the one hand to determine the division into stanzas of that which is still called a sonnet, on the other hand to govern the disposition in segments within that which is still called a verse of a poem. That there results a nonregularity disavowing that of the reference (fixed form on the one hand, metric on the other) is undeniable, but this reference to chance does not change the fact that the nonregularity is not accidental: it results from the decision to use it, thus is predetermined, thus is constrained. It is furthermore supremely difficult, as any computer will tell you, to extract spontaneously from one's head nonregular series, and even series that are non-grossly-regular. Rigid mechanisms, very poor from the combinatoric point of view, will appear: the gesture of freedom will lead to stuttering.

23. THE AXIOMATIC METHOD. The Oulipo's constraint method leads one inexorably to think of another, particularly in favor during the 1940s to the 1960s (the Oulipo's incubation years), the axiomatic method. Let us listen to Bourbaki:⁴⁶

“Strictly speaking, the axiomatic method is nothing other than the art of drafting texts whose formalization is easy to conceive. This is by no means a new invention, but its systematic use as an instrument of discovery is one of the original traits of contemporary mathematics. It matters little whether the formalized text is to be written or read, whether one

attaches such and such a meaning to the words or signs of this text or rather none at all; only the correct observation of the rules of syntax matters. It is thus that the same algebraic calculation may, as everyone knows, serve to solve problems involving kilograms or francs, parabolas or uniformly accelerated movements. The same advantage, and for the same reasons, accrues to any text drafted according to the axiomatic method. . . .”

One might say that the Oulipian method *imitates* the axiomatic method, that the former is a transposition of the latter, a transfer to the field of literature.

Proposition 14: A constraint is an axiom of a text.

Proposition 15: Writing under Oulipian constraint is the literary equivalent of the drafting of a mathematical text, which may be formalized according to the axiomatic method.

Undoubtedly this is only an ideal situation, for two reasons. First, in spite of the undeniable classification progress represented by Quenelejoff's Table, it is clear that the domain of the formulation of constraints, as opposed to that of axioms (inscribable in the “unique source” of sets, for example), remains strongly unhomogeneous, its heterogeneity easily surpassing that which existed in the nineteenth century between the “obvious truths” of geometry (syntactic and semantic “truths” of ordinary language) and the even then “freer” (as Bourbaki notes) formulations of algebra (versificative “rules,” for example). Second, and still more important, even if the “axioms” of an Oulipian constraint may be established with sufficient precision (as in the case of the lipogram), what will play the rather primordial role of deduction in mathematics? What is an Oulipian demonstration?

One may think that a text composed according to a given constraint (or several constraints) will be the equivalent of a theorem. It is a fairly interesting hypothesis. It is nonetheless true that the foreseeable means of passage from the statement of the constraint to its “consequences,” the texts, remain in a profound metaphorical vagueness.

This question never ceased to preoccupy Queneau; clearly, if the historical possibility (a question of relative chronology) of disposing early on of current developments in the logic of the theory of categories and linguistics (multiple deductions: according to a formal system, according to the language) had been given to him, he would have furnished decisive progress in the effort to answer this question. In spite of everything, we have two indirect testimonies to this preoccupation.

24. First (see 28 for the second), the constant fascination exercised on him (and partly because of him on the Oulipo) by a form, that of the sonnet:

the writing of sonnets,⁴⁷ the hundred thousand poems, whose basic element is the sonnet,⁴⁸ and certain manipulations and transformations brought to these "most sonnetlike of all sonnets," the sonnets of Mallarmé,⁴⁹ are all proof of this, among other proofs.

Now it is well known that the form and the practice of the sonnet in many languages make it appear as a poetic model of deduction, as "poetic reasoning"; this is true not only of the articulation of the discourse of what a sonnet says, but also, simultaneously, of the formal, rhythmic organization itself.⁵⁰ The Oulipian exploration of the sonnet constitutes for Queneau a practical means of approaching the problem of "demonstration" according to constraints.⁵¹

25. An Oulipian work has come close to a possible answer: I am referring to G. Perec and M. Bénabou's A.P.F.L. (Automatic Production of French Literature).⁵²

"Method: One chooses two utterances that are as different as possible. In each of these two utterances, one replaces the significant words with their definition to obtain a quotation '*à la manière de...*' After a series of transformations, the two original utterances result in a single text." The example (partially) treated would result in an Oulipian demonstration of the equivalence of the following two utterances:

"Utterance 1: The presbytery has lost none of its charm, nor the garden its brilliance.

"Utterance 2: Workers of the world, unite."

It has been conjectured that, according to this method, any two utterances in a language are always equivalent, that is, that according to this mode of deduction, language is tautological.

26. The *Oulipian method*, like the *axiomatic method*, runs into a wholly natural, if insidious, difficulty, that of the relation between arbitrariness and tradition. Let us listen again to Bourbaki, in the presentation of his book on topology:

"The choice of the axioms to be imposed on the surroundings is obviously rather arbitrary, and historically it has caused long gropings . . . the system of axioms finally chosen responds to a considerable extent to the present needs of Analysis, without falling into an excessive and vain generality."⁵³

And still again: "The first efforts to define that which the properties of sets of points and of functions have in common were carried out by Fréchet and F. Riecz, but the former, beginning with the notion of enumerable infinity, did not succeed in constructing a commodious and fertile system of axioms. . . ."⁵⁴

Underneath the good-natured, pragmatic certitude, one sees the difficulty arise. Between systems of axioms, considered purely from the formal point of view, there is hardly a reason to choose. The reasons for the choice: "commodity, utility, fertility, beauty . . ." which vary according to the needs of the mathematical schools, are, finally, solidly anchored in the historical situation and the state of the tradition. Queneau's attitude (and that of the Oulipo) toward traditional constraints, if it is less bold and naive than Bourbaki's, reflects nonetheless the inherent ambiguity of the procedure: on the one hand, the eminently arbitrary character of constraints is revindicated; at the same time traditional constraints are marked as arbitrary, but, precisely because they are traditional and solidly anchored in history, they guard a power of fascination that situates them elsewhere, beyond the arbitrary . . . it is difficult to get out of this; and considerations outside the problem, the valorizing justifications of the type developed "innocently" by Bourbaki in the passages quoted, threaten.

27. It is undoubtedly the necessity of situating oneself, of distinguishing oneself from tradition, which explains one of the strange characteristics of the Oulipian method: the tendency—not really explicit but strongly encouraged, as far as I can judge, by Queneau—toward *unicity*. It works like this: a constraint having been defined, a small number of texts (only one, in some cases) are composed by deduction from this axiom, which then ceases to preoccupy the Oulipo; the former then enter either into the public domain or into that of the "applied Oulipo" (whose status is but ill-defined).

Proposition 16: The ideal constraint gives rise to one text only. (In fact, there even exists a tendency, which might be qualified as *ultra*, for which every text deduced from a constraint must be classed in the "applied" domain, the only admissible text, for the Oulipian method being the text that formulates the constraint and, in so doing, exhausts it. This, it seems to me, is to omit the deductive aspect of the method. *Proposition 16a:* A constraint must "prove" at least one text.)⁵⁵

Here, we are at the very antipodes of the functioning of traditional constraint. The latter presupposes multiplication, and even demands it. To return to the (very typical) example of the sonnet, a sonnet is something that does not exist. The first sonnet, at the moment of becoming a sonnet, is not a sonnet but a Sicilian variant of the Provençal *cobla*. It is only with the thousandth sonnet (or more or less—in any case after many sonnets) that the sonnet appears. Moreover, an efficient traditional constraint tends toward imperialism: when the alexandrine triumphs in French prosody, it invades everything. French tends to become alexandrine (and non-alexandrine, to organize itself in relation to the alexandrine). Oulipian con-

straint, on the contrary, can tend toward multiplicity (toward which, seemingly, it is tending) only in ceasing to be Oulipian.

28. THE "FOUNDATIONS OF LITERATURE." To use in Oulipian fashion the Oulipian method in order to compose a system of axioms for literature: that is Queneau's project in one of his very last texts, published in the Bibliothèque Oulipienne in March 1976:⁵⁶

*Les Fondements de la littérature
d'après David Hilbert*

29. *The model is in fact one of the fundamental texts of the axiomatic method, the famous *Grundlagen der Geometrie*, the first edition of which dates from 1899.* In this work, whose impact was very great, Hilbert described for the first time in a detailed, rather than circular, manner the properties of a "geometry," beginning with an explicit system of axioms. Queneau in his introduction speaks of Hilbert's starting point:

"After having listened at Halle to a paper presented by Wiener . . . David Hilbert, waiting for the Königsberg train in the Berlin station, murmured pensively: 'Rather than points, lines, and planes, one might just as well use the words tables, chairs, and drinking glasses.'"⁵⁷

30. The principle adopted by Queneau, after Hilbert, is the following: "Taking my inspiration from this famous example, I present here a system of axioms for literature, replacing in Hilbert's propositions the words 'points,' 'lines,' and 'planes' with, respectively, 'words,' 'sentences,' and 'paragraphs.'"⁵⁸

The result, armed with all the unshakable coherence furnished by Hilbert's text, is consistently surprising in its linguistic intuition.

The following axiom: "A sentence having been given, and a word not belonging to this sentence, in the paragraph determined by the sentence and this word, there exists at the most one sentence including this word which has no other word in common with the first given sentence"⁵⁹ may be merely the Quenellian translation of an obvious truth, "Euclid's Postulate"; nevertheless, its "literary" pertinence causes some perplexity.

But certain consequences impose themselves. Thus, this corollary to "Theorem 7":

"Every sentence includes an infinity of words; one perceives only a very few of them, the others being in the infinite or being imaginary."⁶⁰

31. Why? What for?

32. THE RUIN OF RULES. The "what for" is clear: recourse to mathematics according to the modalities we have just described in a few propo-

sitions (propositions 1 to 16, conjectures 1 and 2, the axiom about constraint) has a sole finality: literature. It remains to furnish some hypothesis about the "why," in order to better elucidate the "how."

The solution, undoubtedly, is not unique. We shall choose this one: a sentence in *Bâtons, chiffres et lettres*, from 1937.⁶¹

Proposition 17: There are no rules after the moment when they outlive their value.

The exhaustion of tradition, represented by rules, is the starting point in the search for a *second foundation*, that of mathematics.

Proposition 18: Mathematics repairs the ruin of rules.

The problem of "value" is to be put in parentheses.

33. Once the "shift" has been made, from the rule to the constraint by axiom, mathematics then furnishes another concept of substitution: for replacing "form." After the 1937 statement that we used for proposition 17, Queneau wrote:

"But forms subsist eternally."

The notion then substituted for this "eternity," leaving the question of "eternity" in darkness, is of course the keystone of the Bourbakian edifice, the notion of *structure*.

34. STRUCTURES. Structure, in its Quenellian and Oulipian sense, has only a minimal relation to "Structuralism." Ideally (like constraint in respect to axiom), it refers to the Bourbakian structure: the object in the mathematical case is a (or several) set(s) with something "on it" (one or several algebraic laws; proximities in topology . . .); in the case of the Oulipo, the object is linguistic,⁶² and its structure is a mode of organization. This structure will satisfy one or many conditions: axioms in one case, constraint in another. Thus, a set armed with a law of composition will have a monoid structure if this law obeys the axiom of associativity; a text will have a lipogrammatic structure if it obeys the constraint of the same name. It is clear, and this is an important point, that the Oulipian notion of structure is not entirely distinct from that of constraint, many structures (traditionally) remaining implicit: must a lipogrammatic sonnet be examined in the same manner as a lipogrammatic novel? A topological group is, certainly, a group and a topological space, but its operation and its topology are not indifferent one to the other. How may we approach, in Oulipian fashion, this link in the case of the lipogram, for example, and in that of the sonnet? The neutrality of the conventionality of the props (texts, poems, stories . . .) is without doubt an obstacle in the development of the Oulipian notion of structure. In this sense, one understands why Queneau never wrote an "Oulipian novel."

35. For the present, the most efficient method seems to be that of "structure transport": a set, armed with a given structure, is "interpreted" in a text; the elements of the set become the data of the text; the structures existing in the set are converted into procedures for composing the text, with constraints: a privileged experiment is that of Georges Perec's work-in-progress, written from a Latin bi-square.⁶³

36. An examination, in this perspective, of the celebrated *Cent Mille Milliards de poèmes* will permit us to shed some light on this book's place in the passage from mathematics to its literalization.

Let us remember this principle: ten sonnets are written, using the same rhymes. The grammatical structure is such that every verse of every "base" sonnet may be smoothly interchanged with any other situated in the same position within the sonnet. Thus, each verse of a new sonnet has ten possible independent choices. There are fourteen verses; there exist thus, virtually, 10^{14} or one hundred thousand billion sonnets.

What does this in fact signify? Let us proceed by analogy: let us take ten letters; let us then take certain letters among these, any ones, and put them one after the other; let us call the result of this a *word*. We do not impose upon the "words" thus constituted the necessity of figuring in any dictionary whatever. The "procedure" works freely and furnishes, according to the number of letters which one accepts in a "word," a more or less considerable quantity of such words. One thus has a more or less extensive piece of the "free monoid" constructed on the given letters, a "free object" of monoid structure.

Let us then consider the "hundred thousand billion" as "free object" of sonnet structure, as the book, metaphorically, of free structure.

Whence for this reason also its importance: for let us try, in analogous fashion, something very similar with a sonnet by Baudelaire, for instance: to substitute one verse for another therein (in this same sonnet or elsewhere) all the while respecting that which makes it a sonnet (its "structure"). One will run up against what Queneau parried in advance (and that is why his "structure" is "free"), difficulties whose nature is principally syntactic. *But*—and this is what the "hundred thousand billion" really teach us—*against* the constraints of semantic verisimilitude, the sonnet structure makes from (virtually) a single sonnet all possible sonnets through all the substitutions that respect it. The proposed sonnet, if it imposes a choice, or rather proposes to impose one, does not eliminate the other possibilities, which expand it: confrontation of structural "freedom" with the constraints of the milieu (linguistic or other) in which it inscribes itself.⁶⁴

37. We may now situate this key concept of Quenellian work, which ap-

pears in the Oulipo's very name: *potentiality*. The Oulipo is potential literature because the givens of a structure are those of all the virtualities of free objects, if they exist, of all the virtualities of the texts that realize it, necessarily multiple; the unicity of the Oulipian text actualizing a constraint (Proposition 16) being then envisaged only on the condition that this text contain all the *possibilities* of the constraint—texts and virtual, potential readings: multiplicity again but, unlike that which traditionally results from the multiplication of examples, implicit and, at the outside, imaginary multiplicity (Proposition 16a), exhausted by the very gesture that announces or writes the structure.

38. An explicit trajectory leads thus from mathematics, as reading and practice in writing of this practiced mathematics: this, in great part, is the creation and the advance of the Oulipo. We shall not go any further here, that is, to search for the invisible mathematics in the more visible part of Queneau's work: novels, poems—not that it cannot be found (at least partially),⁶⁵ but because its dissimulation is a necessary part of Queneau's project and of his method. Let us leave this unmasking to others, and until later. Let us merely try to elucidate its meaning.

39. THE MEANING OF COMBINATORICS. We have, above, justified the "recourse" to mathematics as a consequence of the "collapse of rules." Granted this, it remains to understand the why of the combinatoric choice, of the arithmetical bias. Why, anywhere one looks, does one almost always find whole numbers in Queneau?

40. A piece of evidence: "*It was intolerable to me to leave to chance the number of chapters in these novels.*"⁶⁶ Thus, *Le Chiendent* is composed of 91 (7×13) sections, 91 being the sum of the first thirteen numbers and its 'sum' being 1, it is thus both the number of the death of beings and that of their return to existence, return which I then imagined merely as the irresolute perpetuity of hopeless grief. At that time, I saw in 13 a beneficent number, because it denied happiness; as to 7, I took it, and may still take it, as a numerical image of myself, since my last name and my first and middle names are each composed of seven letters, and I was born on a 21st (3×7)."

Another piece:

"—Look here, that is awfully idealistic, what you're telling me.

—Realistic, you mean: numbers are realities. They exist, numbers do! They exist as much as this table, sempiternal example of philosophers, infinitely more than this table! Bang!

—Couldn't you make a little less noise, said the waiter."⁶⁷

41. The obvious intensity of this numerical, or rather numerological, identification of personal identity, the suggestion of the extraterrestrial or historical intrinsic reality of numbers: all that evokes⁶⁸ a specter which already made an insidious appearance in section 4 in connection with *s-additive* series: indeed, let us remember the following remark, already quoted above:⁶⁹ "For $I' = I$, we discover with pleasure Fibonacci's numbers"; now Fibonacci's numbers, which are constructed (as Queneau graciously points out) according to a procedure analogous to that on which he is working, have, it is well known, the particularity of being at the center of very honorable and ever-resurgent old esthetico-metaphysical speculations, since the relation between two consecutive numbers in the series tends toward a limit, called *golden number*. One may then allow oneself to suppose that, somewhere in the study or the project of the *s-additive* series, something "additional to" their production intervenes, different from the secrets of their enumeration: the search for a new multiplicity of limits (or of non-limits, when the series is interrupted), each the founder of a remarkable and perfect proposition, a number no longer golden, but made of some other precious element, "rare earth" of esthetics: an eminently ironical multiplication of the truth of beauty.

42. This, still: "*There are forms of the novel that impose all the virtues of the Number on the material proposed and, springing from the very expression and from the various aspects of the story, connatural with the guiding principle, daughter and mother of all the elements it polarizes, a structure develops that transmits to the works the last rays of universal light and the last echoes of the Music of the Spheres.*"⁷⁰

43. CONTEMPLATING THIS, WE SHALL PART.⁷¹

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.

- A Story as You Like It
- 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.

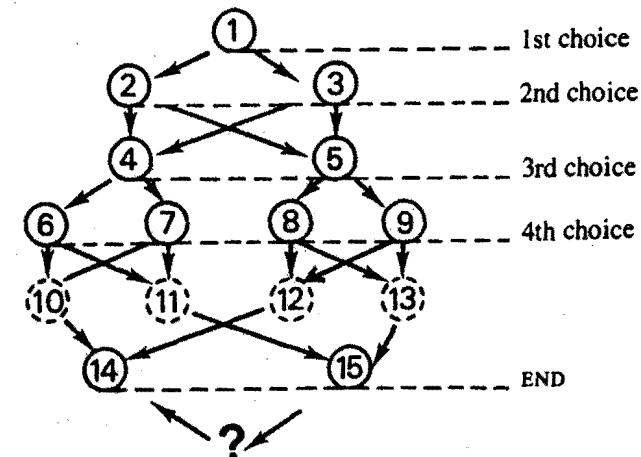
Paul Fournel

in collaboration with Jean-Pierre Marais

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

function of the locality: the audience in a theater may, for example, vote by a show of hands; in the case of a radio play, by telephone, etc. The essential point is that the vote should not take too much time.

In the example which we have elaborated, the audience will be asked to choose four times, which means that there will be five scenes in the play. Given that our "tree" contains fifteen scenes (four of which do not lead to choices), sixteen different plays of five scenes each may be engendered. In order to produce these sixteen plays in traditional fashion, one would have to write eighty scenes (16×5). We have thus economized sixty-seven scenes.

The Theater Tree: In order that the structure be immediately recognized by the audience, we have tried to construct simple plots and intrigues, for which the choices offered to the audience are both real and functional.

Scene 1: The king is unhappy; misfortune reigns in the palace. The queen, returning from a journey, cannot comfort him. He is unhappy for one of the following reasons, between which the audience will choose:

- His daughter the princess has lost her smile. (see scene 2)
- The princess has been kidnapped. (see scene 3)

Scene 2: The princess appears upon the stage. She is unhappy. The king offers a reward to him who will make her smile again. The queen, step-mother of the princess, rejoices secretly. The candidates come and go with no success. The masked hero arrives; the princess smiles.

The king and the queen argue. The king learns that the queen has a lover, by whom she is pregnant, and the queen learns that the king has a lost son. Is the masked hero:

- The king's son? (see scene 5)
- The queen's lover? (see scene 4)

Scene 3: The queen wails hypocritically in the presence of the king. With the princess gone, the child whom the queen is carrying will reign.

In the forest, the enchainèd princess falls in love with her kidnapper, and asks him to take her back to the palace as proof of his love. At the palace, the king and queen argue. The queen has a lover, by whom she is pregnant, the king has a lost son. During this argument, the masked man and the princess arrive. Who is the masked man?

- Is he the king's son? (see scene 5)
- Is he the queen's lover? (see scene 4)

Scene 4: The masked man is the queen's lover. The princess faints. The king, beside himself with rage, commands that the instruments of torture be brought to him.

- Will he kill his wife? (see scene 6)
- Will he challenge the lover to a duel? (see scene 7)

Scene 5: The hero avers that he is the king's son. The princess faints. The queen demands proof and perfidiously asks that the young man be thrown into the noble-pit in order to determine if he is a blueblood.¹ The king fails to recognize the absurd character of the situation, and accepts. Only the princess can save the masked man:

- Will she awaken? (see scene 8)
- Will she remain unconscious? (see scene 9)

Scene 6: The king puts his wife in the torture machine. He will use this device to eliminate her.

- Would you like a happy ending? (see scenes 10 + 14)
- Would you like an unhappy ending? (see scenes 11 + 15)

Scene 7: The king challenges the lover to a duel. In the course of the fight, the queen is killed.

- Happy ending? (see scenes 10 + 14)
- Unhappy ending? (see scenes 11 + 15)

Scene 8: The princess awakens. She demonstrates the absurdity of the situation to her father. In a fit of rage, he forces his wife to test the device; she dies.

- Happy ending? (see scenes 12 + 14)
- Unhappy ending? (see scenes 13 + 15)

Scene 9: The princess does not awaken. The king, before throwing his son into the noble-pit, wishes to see if it is in working order, and throws his wife in. She dies.

- Happy ending? (see scenes 12 + 14)
- Unhappy ending? (see scenes 13 + 15)

Scene 10: The queen is dead. The king and the lover are relieved. In

fact, the lover had seduced the queen in order to get into the palace. But he loves the princess. He is sad, however, to be her brother (recognition).

—Go to scene 14.

Scene 11: The lover, mad with rage, kills the king.

—Go to scene 15.

Scene 12: The king recognizes his son. The hero and the princess are unhappy, since, although they love each other, they cannot marry, being brother and sister.

—Go to scene 14.

Scene 13: The hero, mad with rage, kills the king (he loved the queen).

—Go to scene 15.

Scene 14: In fact, through a complicated play of marriages and adoptions, the hero and the princess are not brother and sister, and are thus free to marry.

Scene 15: The king is dead. The princess kills the hero and throws herself into the noble-pit (she is rejected, but if the spectator wishes to know why, he must come back to see the play again, because the reason for this rejection is explained in scene 14).

Examples of possible combinations: 1-2-4-6-10-14; 1-2-5-8-12-14; 1-3-5-9-13-15; etc.

N.B.: It is obvious that a résumé such as this cannot pretend to replace the rigorous coherence we have tried to maintain throughout the play.



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 Milliards 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 combinatory nature is the *Cent Mille Milliards de poèmes*, and although Raymond Queneau and François Le Lionnais are the cofounders of the Oulipo, created simultaneously, it should not be deduced that combinatory 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), matrical algebra (R. Queneau's multiplication of texts), etc. . . .

It is within this last current that combinatory 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 combinatory 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 verschwindt*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 Baptista 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, € (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 combinatory 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 Milliards 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.

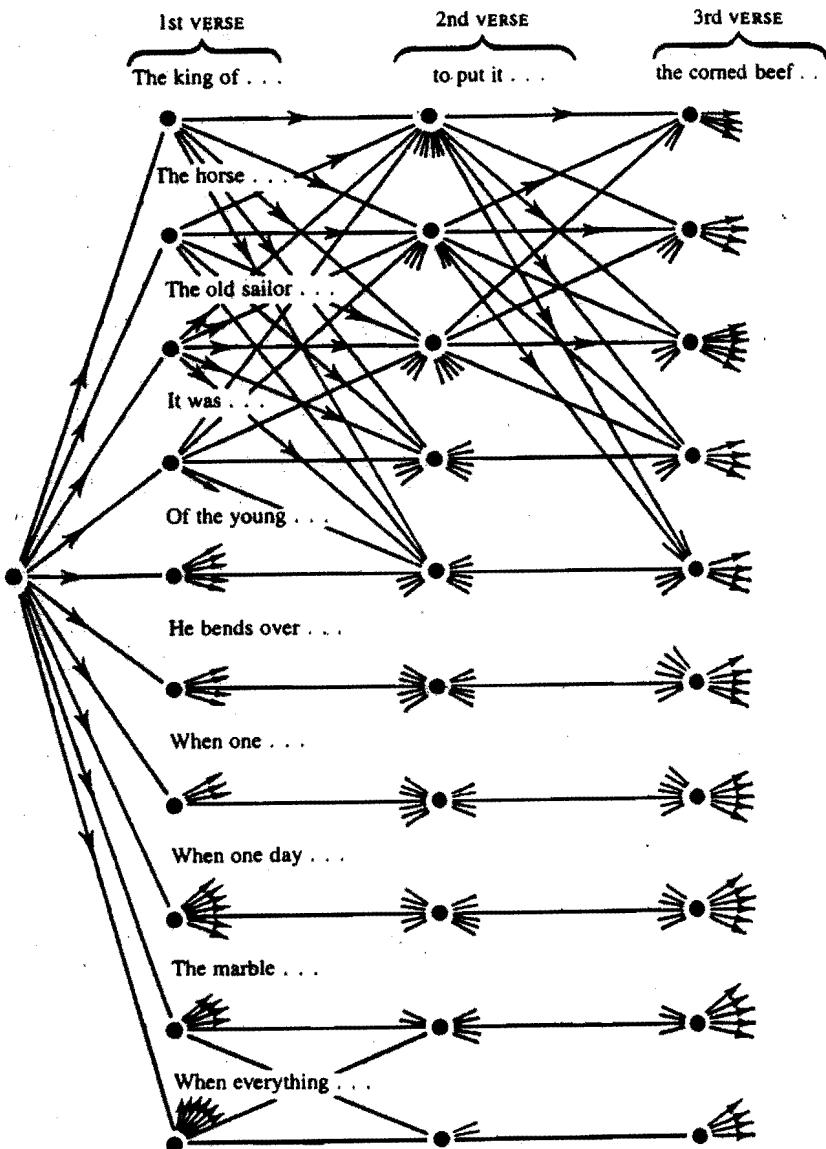
Other pathway procedures were proposed by Paul Briffort and François Le Lionnais at the 79th meeting of the Oulipo. This principle is also behind Raymond Queneau's "A Story as You Like It." This text, submitted at the Oulipo's 83rd working meeting, draws its inspiration from the instructions given to 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

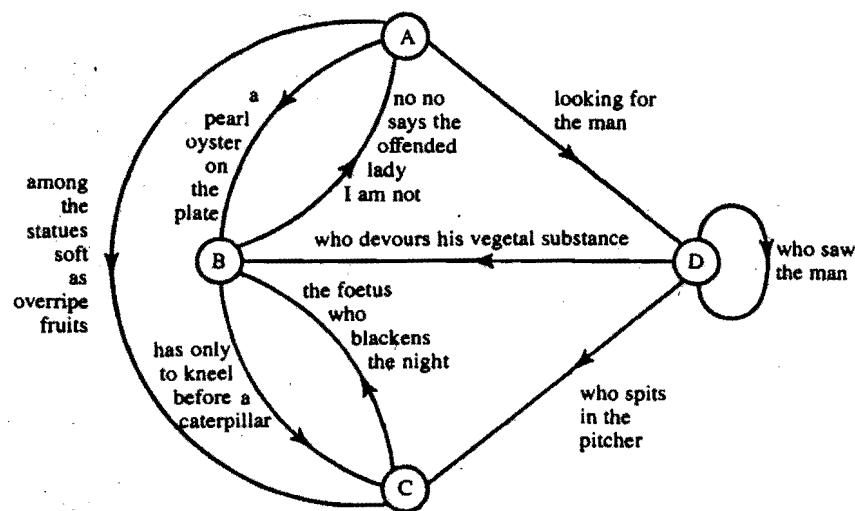
Principle of the graph of the Cent Mille Milliards de poèmes (not all of the arcs and vertices have been drawn)



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



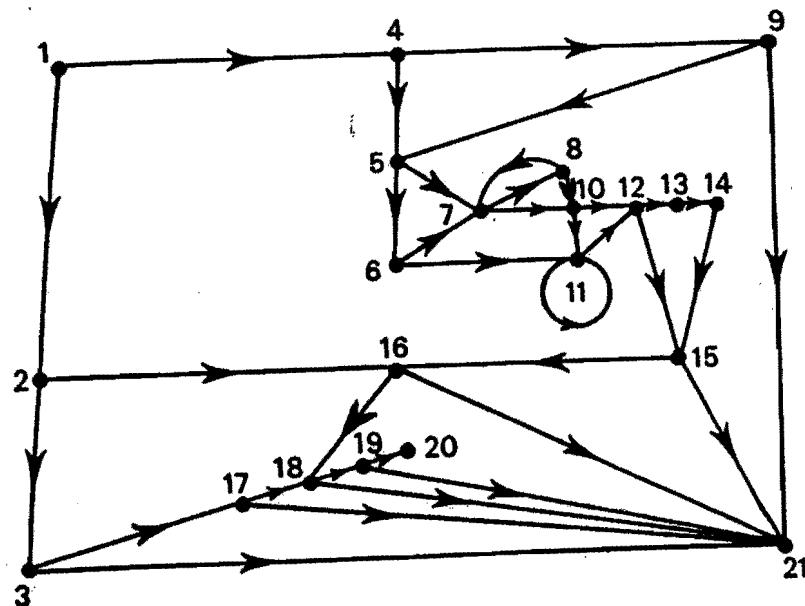
The verses corresponding to the arcs arriving at the same point (or leaving from the same point) were chosen in function of a very precise constraint; for example, those that end up at point D contain the word "man"; those leaving from point D have the same grammatical structure, etc. . . . Using this 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

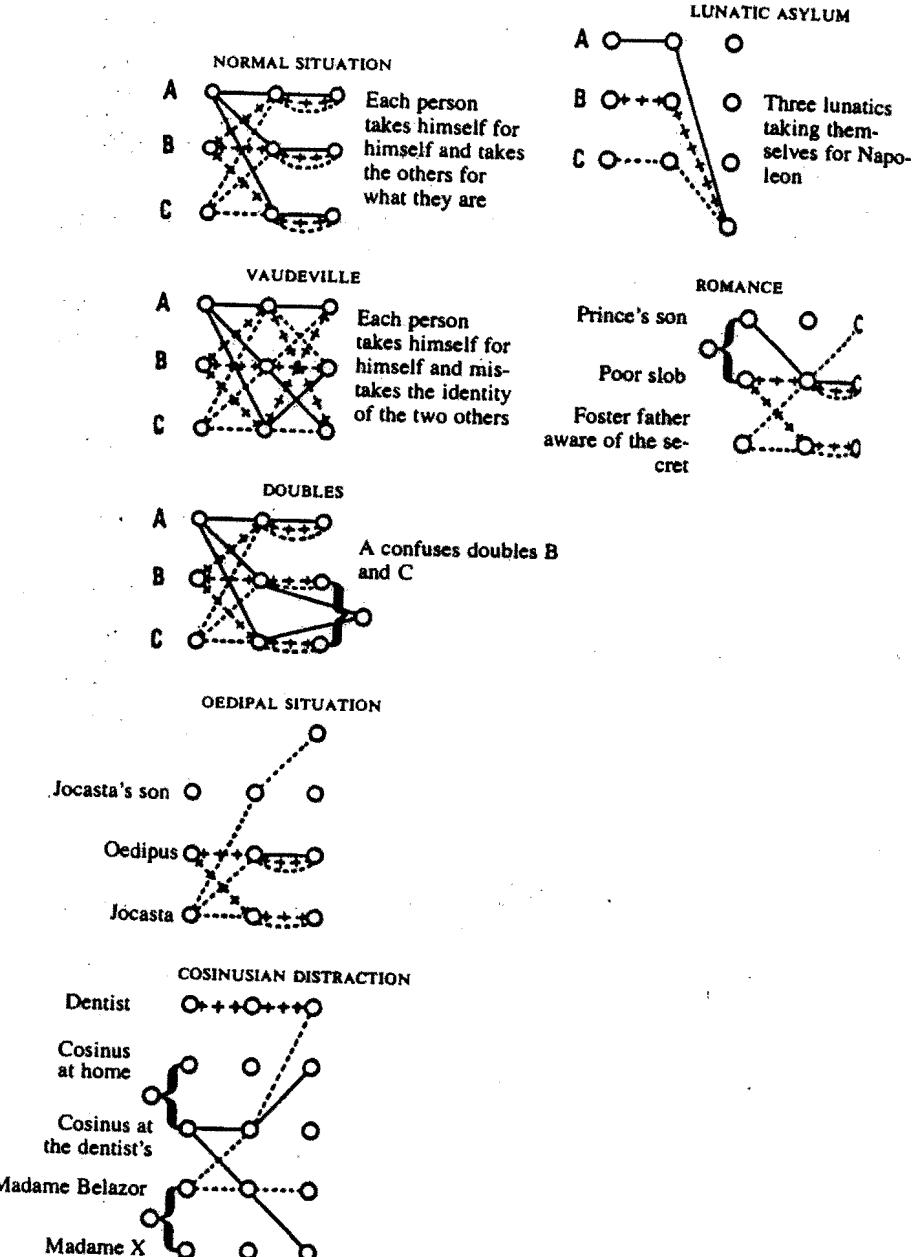
Bifurcating graph representing the structure of Raymond Queneau's "A Story as You Like It," *Lettres Nouvelles*, July-September 1967. (We owe this sagittal representation to Queneau)



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.

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



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)

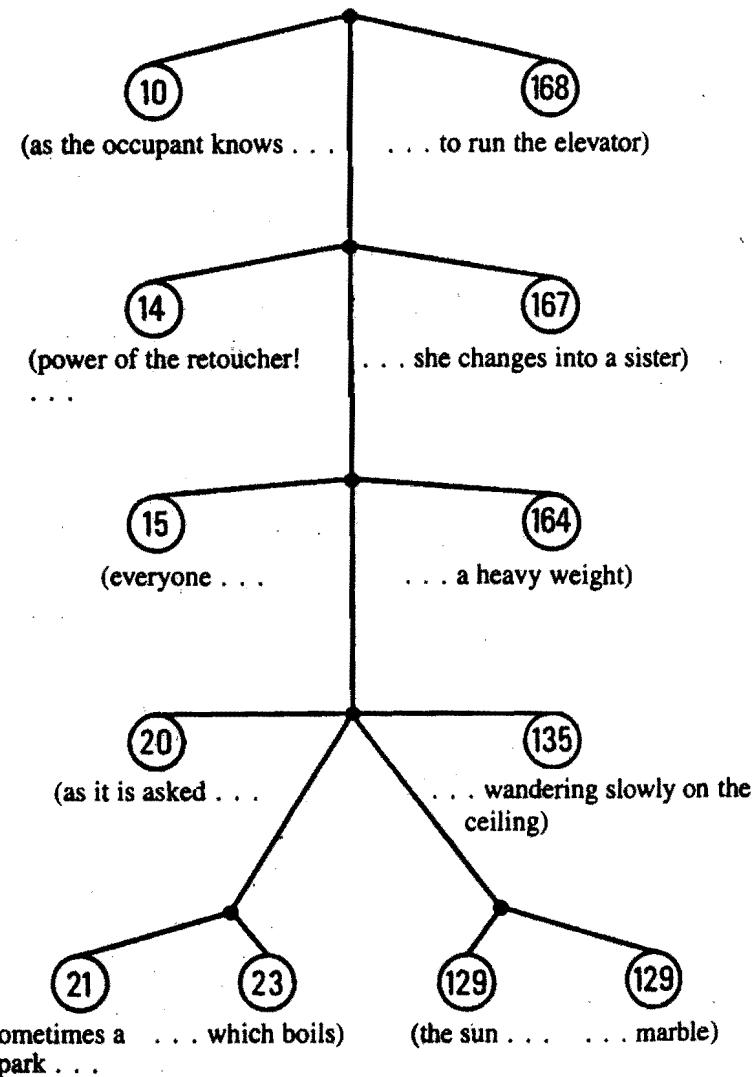


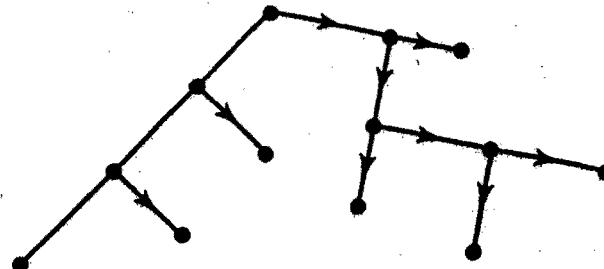
Figure 6

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. . . .

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

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 Gueneau

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

Amphytrion

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

If every character takes himself for himself (that is, if $a^2 = a$, $b^2 = b$, etc.) and takes no other for himself (that is, if $ax \neq a$, $bx \neq b$, etc.), there will result only one possible situation for two characters, 12 for 3 characters, 108 for 4, and, more generally, $(n - 1)^{n-1}$, n for n characters ($n > 2$).

Consider the following interesting theorem.

The multiplication table of a group (Abelian or not) corresponds to the following situation: nobody takes himself for what he is, nor takes the others for what they are, with the exception of the unity-element, which takes itself for what it is and takes the others for what they are.

In other words, the multiplication table of a group corresponds to a situation both vaudevillesque and mad, as seen by a lucid observer (the author for example).

Commutativity of the multiplication: The multiplication is commutative when $ab = ba = c$, that is, when Paul takes John for Peter and John also takes Paul for Peter (always in the case where nobody takes himself for somebody else).

Exercise: Find concrete examples of this situation in French or foreign literature, theater or novel.

Exercises: Find concrete situations corresponding to the following semi-groups proposed by R. Croisot in "Propriétés des complexes forts et symétriques de demi-groupes," *Bulletin de la Société Mathématique de France*, vol. 80 (1952), pp. 217-227.

	a	b	c	d		a	b	c	d
a	c	c	d	a	a	a	a	a	a
b	c	c	d	a	b	a	a	a	c
c	d	d	a	c	c	a	a	a	a
d	a	a	c	d	d	a	c	a	b
	a	b	c		a	b	c		
a	a	b	c		a	a	c	c	
b	b	c	c		b	c	b	c	
c	c	c	c		c	c	c	c	

II

We have assumed until now that the multiplication was defined globally, which is not always the case. When there are isolated points in the "graph," we may assume that the product is then 0.

Three madmen (a, b, c) take themselves for Napoleon (n) and each of them takes the two others for what they are:

	a	b	c	n
a	n	b	c	a
b	a	n	c	b
c	a	b	n	c
n	0	0	0	0

Another convention might be that n (fictive) would take a , b , c , for what they are and, on the other hand, that a , b , c would take n for what he was. One would then have:

	a	b	c	n
a	n	b	c	n
b	a	n	c	n
c	a	b	n	n
n	a	b	c	n

Oedipus

	a	b	c	d
son of Jocasta	= a	b	c	d
Oedipus	= b	0	b	c
stepfather	= c	b	a	c
Jocasta	= d	0	b	c

Exercise: Find a formulation of this situation without zero.

Paul Fournel

Computer and Writer

The Centre Pompidou Experiment

When the literary project of the A.R.T.A. was launched, rapid efforts had to be made to establish a basis for a possible agreement between computer science and literary creation.¹ Christian Cavadia entrusted the whole of the project to Paul Braffort (logician, computer scientist, and writer), whose first goal was to educate the public and the writers themselves about this new undertaking.

Aided Reading

At first, work was brought to bear on preexisting literary material. There are, in fact, a few combinatory or algorithmic works that may be read far more easily with the help of a computer. Here, the machine performs a simple task of selecting and editing.

Combinatory Literature

The *Cent Mille Milliards de poèmes*² by Raymond Queneau furnishes material particularly favorable to this type of experiment. It consists of ten sonnets composed such that each verse of each of them may be combined with any of the other verses in the ten texts, which gives a total of 10^{14} sonnets. The printed collection is very prettily conceived, but the manipulation of the strips on which each verse is printed is sometimes tedious.

The computer, though, makes a selection in the corpus in function of the length of the "reader's" name and the time which he takes to type it into the terminal, then prints the sonnet, which bears the double signature of Queneau and his reader.³

The author himself may profit from this process: when the combinations

are this numerous, he may take soundings of his work. The computer in this case serves as an assistant in the definitive fine-tuning of the text.

Algorithmic Literature

Same application in the domain of algorithmic literature: Dominique Bourguet has programmed Raymond Queneau's "A Story as You Like It"⁴ so as to facilitate its reading. In this brief text, the reader is repeatedly invited to choose what follows in the tale through a system of double questions. The elements of narration being very short, the game dominates the reading of the text itself. This is unfortunate, since all of these possible texts have real charm. The computer first of all "speaks" with the reader, proposing the different choices to him, then prints the chosen text "cleanly" and without the questions. The pleasure of play and the pleasure of reading are thus combined.

In the same spirit and according to the same principles, a medieval tale was programmed by Jean-Pierre Enard and Paul Fournel,⁵ and the 720 fairy tales of a work group directed by J. P. Balpe will be programmed.

Aided Creation

After all of this, the relation work→computer→reader must be replaced by other sorts of relations in which the author plays a role (without necessarily stripping the reader of *his* role). Among the different projects submitted by authors to Paul Braffort, one may already find examples of very different types of relations.

Type 1: Author→Computer→Work

In this type, only creation is aided. The computer is an integral part of the drafting process and its work serves to elaborate the definitive text. Italo Calvino proposes lists of characters, constraints, and events to the machine, asking it to determine through progressive refinement who may indeed have done what. The author thus chooses to work on material that the machine allows him to dominate.⁶

Type 2: Author→Computer→Work→Computer→Reader

The computer intervenes on two levels this time. For one of the chapters in the *Princesse Hoppy*, Jacques Roubaud elaborates, with the help of a machine, a chapter which the reader must read with this same machine.⁷

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 Briffort 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 *anticombinatoric* 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 over-worked 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 *slander*ing 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:

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appropriation of will	$\left\{ \begin{array}{l} \text{to incite} \\ \text{to blackmail} \\ \text{to drug} \end{array} \right.$
-----------------------	--

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.

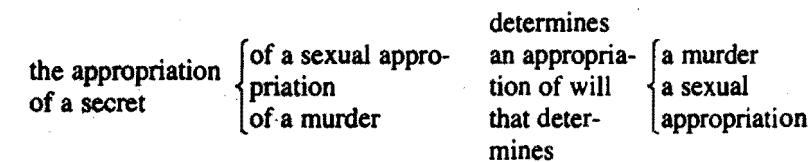
Order of sequences

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

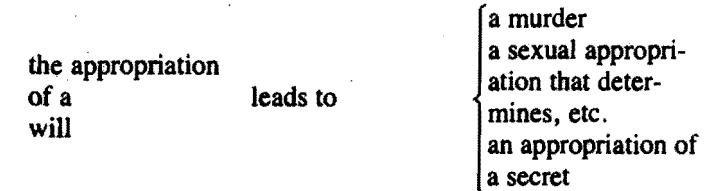
Consequently, it is impossible for the three acts of murder to occur in the beginning of a permutation, because no characters would then be left to accomplish the other actions. Even two murders in the beginning would render the development of the sequence impossible. One murderer in the beginning dictates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



or:



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 to extort</i>	<i>acts of persuasion</i>	<i>disloyal acts</i>	<i>acts that exploit another's weakness</i>
to rape	to incite	to abuse the confidence to stab in the back	to buy good graces to blackmail
to strangle	to seduce	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

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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.

to whom, in case the worst happened, he might entrust his secret. No one besides a very old lady shared his compartment. He strode the length of his car but only traveling salesmen, governesses with children, and other hopeless cases were to be seen. Unwisely he leaped from the train onto the station platform, and doing so felt a surge of darkness within him. The platform was empty except for a young rabbi. Czegka staggered toward him, fell on his knees, and managed to gasp out his discovery before his heart quite collapsed.

The rabbi, who had, although he was Russian, a good grasp of German, was Nathan Milstein's father. Returning to Odessa, he repeated what he had learned to a professor at the St. Petersburg Conservatory, Boris Zaremba. (He was the great-uncle both of Boris Khaikin and, through a niece's Bulgarian marriage, Boris Christoff.)

These facts supply a partial explanation of the excellence of Russian violinists in the twentieth century, and clarify the origins of the controversial expression "Bratislava spiccato."

THE DIALECT OF THE TRIBE

for Georges Perec

Thank you for the letter suggesting I contribute to the *Festschrift* in your honor. I have never doubted that in translating your work I have been of service to our two cultures, but I am flattered to think that my general views on translation may be worth a hearing. I shall be happy to contribute to the homage you are deservedly to receive, not only for the privilege of collaborating in so distinguished an enterprise, but because I truly feel that the subject you have assigned me is a vital one. The longer I live — the longer I write — the stronger becomes my conviction that translation is the paradigm, the exemplar of all writing. To put it another way: it is translation that demonstrates most vividly the yearning for transformation that underlies every act involving speech, that supremely human gift. Of course I am not saying that translation — at least not as I practice it — takes precedence over other modes of writing. On the contrary: it is its modesty that makes it so useful. But while it differs enormously in substance from true writing (like your own), the difference is only one of degree. One might then say that insofar as true writing is a kind of translation, the text from which it works is an infinitely arduous one: nothing less than the universe itself.

By coincidence — only minds poorer than ours would call it accident — I was, as you were writing your letter, engaged in radically extending my knowledge of translation, in a way as appropriate as it was unforeseen.

I had returned for ten days to Fitchwinder University in order to continue my research on the Bactrian controversy. Our old friend Ms. Maxine Moon is still a librarian there; and it was she who brought to my attention the unexpected text that was to occupy me during the rest of my stay. This text was not in Bactrian, it was not about Bactria — in fact it put the Bactrians quite out of my head. It was in, of all things, Pagolak, the speech of a small hill tribe in northern New Guinea; and it had been transcribed for an article in an Australian anthropological journal by one Ernest Botherby (bless him!). It was entitled — by Dr. Botherby perhaps — *Kalo Gap Pagolak*, meaning “magic transformation of Pagolak.” Ms. Moon, correctly, “thought it would interest” me. The text, she said, was an account of a method used by the Pagolak-speaking tribe to translate their tongue into the dialects of their neighbors. What was remarkable about this method was that while it produced translations that foreign listeners could understand and accept, it also concealed from them the original meaning of every statement made.

You will understand that once I had heard this much, it was impossible not to want to learn more. To translate successfully and not reveal one’s meaning — what could be more paradoxical? What could be more relevant? (Is anything more paradoxical than the act of translation?) The crafty Ms. Moon had me hooked. She whetted my craving with the remark that Pagolak was supposedly simple, with structures I could hope to master quickly, and abetted it by supplying two Pagolak dictionaries, one English, the other Dutch.

Ms. Moon had spoken the truth: the language is, as you will see, accessible enough, and I worked long hours at it. I made such progress as to expect by the end of a week to be able to produce an English rendering of *Kalo Gap Pagolak*. (Need I say that you would have been the first beneficiary of this undertaking?) But there is more to any language than its mechanisms, and inherent in the very utterance of Pagolak was something that kept the roughest translation beyond my grasp.

(The dictionaries turned out to be useless. They had been compiled for traders and had only an arbitrary, mercantile utility. The problem, in any case, was not one of particular words.)

As I became familiar with the text, which was an oral declaration by the *abanika* or “chief word-chief” of the tribe, I began wondering why Dr. Botherby had not himself supplied a translation as part of his article. He had done his other work scrupulously: his commentary was packed with useful information; he had clearly taken great care in transcribing the words of the speaker. Had he, too, encountered some obstacle to Englishing the text? The better I understood *Kalo Gap Pagolak*, the surer I became that Dr. Botherby, like myself, had had no choice except to leave the *abanika*’s declaration intact. Was it after all so surprising for a language to resist ordinary procedures of translation when it was itself capable of extraordinary ones? What could be more extraordinary than a method that would allow words to be “understood” by outsiders without having their substance given away? It was true that the *abanika* claimed the power of controlling this method for himself; but I was starting to realize how absurd such a claim might be. For it wasn’t only those like the *abanika* who had this power, but every last member of his tribe. The method did not depend on individual decision; it was an integral part

of the language itself. No one speaking Pagolak could escape it. No one attempting to penetrate Pagolak could elude it.

In a matter of days I found myself perfectly capable of understanding what the *abanika* was saying and perfectly incapable of repeating it in other terms, whether in English, or French — or Middle Bactrian. The *abanika's* declaration, you see, was the very process of transforming language that I expected it to be *about*. It was not an account of the process, it was the process itself. And how can you translate a process? You'd have to render not only words but the spaces between them — like snapshooting the invisible air under the beating wings of flight. An impossibility. All that can be done is describe, suggest, record impressions and effects. That is what Dr. Botherby did for his anthropological colleagues. It is the best I can do for you.

From beginning to end, the *abanika's* words concern the means of bringing about *kalo gap*, the "magic changing," the redirecting of language towards foreign ears in a way that both provides clarity and suppresses translation's customary *raison d'être* — the communication of substantive content. You and I may know that such communication is at best hypothetical, perhaps impossible; that translation may, precisely, exorcise the illusion that substantive content exists at all — but what led a remote New Guinean tribe to such a discovery? Why should it care?

My questions are rhetorical: the *abanika* speaks only of hows, not whys. Let me acquaint you with some of his terms. The hermetic transformation he articulates is associated with the word *nalaman*. More precisely: *nalaman* is the final result of the transformation, while the means of achieving that result is *namele*. As you can see, or better hear, if "*namele*" is to become "*nalaman*," a redistribution of pho-

nemes must take place. Here is a first demonstration of the "magic of changing," in one of its simplest forms. The words representing these changes (*kalo gap*) sometimes involve *namele* and sometimes *nalaman*, according to whether the means or the end is invoked.

Now if *kalo gap* is embodied willy-nilly in the act of speaking Pagolak, awareness of it is something that has to be learned. Young males are schooled in this awareness during their initiation into manhood, or *nuselek*. Dr. Botherby, who underwent the initiation rite (*nanmana*) so as to witness and record it, says that pain and privation make initiates highly receptive, so that they master *namele* rapidly. The core of the instruction (*afanu*) is *sitokap utu sisi*. This phrase leaves an impression, approximately, of "resetting words in [own] eggs": aptly enough, after the youngsters emerge from *afanu* through *sitokap utu sisi* into *nuselek* and its attendant privileges of *ton wusi* and *aban metse*, they claim to be emerging from boyhood (rather: "boybeing") like seabirds from chicken eggs (*utopani inul ekasese nuselek ne sami sisinam*) — dear Christ, it doesn't mean that — but can you perhaps intuit how *tokkele* (not "words," those words) return to their *sisi* to re-emerge in unexpected, unrecognizable forms?

Sitokap utu sisi — this will surprise no one familiar with the ancient Mysteries, the Kabbala, or modern linguistics — *sitokap utu sisi* requires *sutu* (you cannot call it death — perhaps dying, the dying . . .), *narakaviri* (like fire, like burning — fire-as-burning), and *kot* (not just s--t, but life tumultuously swarming out of the tropical dung, or words to that effect). The crux is *narakaviri*. The *abanika* makes this deafeningly clear as he cries over and over *nuselek ka namele nanmana nalaman nanasiluwo narakaviri* — of course he is, as well, making a magical pun, magical in the incantatory repetition of the initial *na*, punning in that it identifies the initiation of the young men (*nanmana*) with

the transformation of language they are submitting to (*namele*). *Narakaviri ne se eleman* again indicates the primordial role of fire-being-burning, although *sutu* and *kot* are never forgotten. (Examples: *umanisi sutu kalasaviri nekkolim* and *tuku kot, kot kotavan*.) But the moment of *narakaviri* is supreme — above all for us, for you and me, writer and translator. *Nusu tese alukan*, you might say (but they would not say it, not in *nalaman*, because *alukan* is a foreign word, meaning "gold").

Now, dear colleague, and companion, please look hard at these two short passages in Pagolak. Each points to *narakaviri*, to this critical moment in *namele*. The first enacts the way up to it (*pakanu*), and the second the way down from it (*plot*). You can enter these passages. What I propose is not reasonable, not unreasonable. Enter these two passages. You have no need for more knowledge. Your awareness is equal to the task. This is a task: like all tasks correctly performed, it leads to revelation. Move (as I did) through the first passage to the last, become the bodily metamorphosis that this movement inspires, and you will have made the great lurch forward in your *afanu*. Then we shall walk in the light of *nuselek* together.

What you must provide is attention. Your attention must be absolutely ready. More than that: you must expand it in a decorum of complete accessibility, in a ripeness as for dying, with the sense of a purpose vast but as yet unknown. Do not think, do not care: Be!

First, pakanu:

"*Amak esodupelu mukesa dap alemok use dup ulemaka.*" (Repeat three times.)

Last, plot:

"*Amak esudupelu moke sadapalemuk use dup olemaka.*" (Ditto.)

Helpful hints: don't bother with *amak*, a conventional opening

lan; or with *dup*, which signals that an utterance is almost *nalaman*. *Mukesa dap alemok* includes, in a polysemistic context, the proverb "Like jug, cork woman['s mouth]," while *moke sadapalemuk* among other things refers to a folksong in which "impetuous [husband] withdraws-from-vagina." (Women are thought to create *namele* naturally, along with language; but as I hardly need tell you, they have no mastery of it — no power of *nalaman*.) Similarly, where *use ulemaka* involves "burning the old field," *use olemaka* leads to "burning (i.e. cooking) new fish."

Submit to the passages once again. Do you see how beautiful this is? How brightly *narakaviri* colors the dawn sky? Brighter than any *ulemakal*! And now how bright and clear it must be that *namele* never be explained, or *nalaman* understood! Listen: *awa nuselek kot tak nalaman namele Pagolak!* I promise to steal the book for you, from this selfsame library — fuck Ms. Moon, since she won't let me Xerox it. I shall do this for you — what wouldn't I do for you? And even before you share the totality of the words, you — *abanika* yourself, *abanika esolunava* — can partake of my *tunaga* (joy-as-it-becomes-joy), my utter *nasavuloniputitupinoluvasan*, as the birth-wording goes, when *alemok* brings forth *tupinohi* who will some day come to *nuselek*. Such twenty-one carat *alukan* for our own *namele* and *nalaman* — words into words, sparse scraps resurrected in the plenitude of unentrammelled recreation! And I promise to turn to the composition for your Festschrift as soon as this letter is mailed. Meanwhile, *nasavuloniputitupinoluvasan!* And let me on this private occasion add a few last words, spoken out of the fullness of my mind and heart with admiration, with devotion, with love: *Amak kalo gap eleman nama la n'kat tokkele sunawa setan amnan umanisi sutu pakotisovulisanan unafat uplenumo kona kafe avanu lo se akina ba nasavuloniputitupinoluvasan (!!) abanika*

esolunava efaka nok omunel put afanu nanasiluvo sitokap utu sisi
namu nanmana tes awa nuselek kot tak nalaman namele Pagolak
kama —

REMARKS OF THE SCHOLAR GRADUATE

The headmaster has asked me to give you boys, briefly and in plain language, a resumé of my work. I know that as with all scientific discoveries mine has been doubly misrepresented to the lay world — by half-comprehending news media on one hand, by professional journals with their confusing jargon on the other. Then there have been the dust clouds of controversy shrouding further what is essentially not a difficult set of facts. And I'm glad of this occasion not only because of the pleasure of paying modest homage to the school where I acquired the first tools of scholarship, but because as regards the controversy I want to repeat — well, that is not quite honest, let me rather say assert, something that could not be admitted earlier lest my whole hypothesis be disgraced: Gartner was right. At least he was, as far as his main claim was concerned, not wrong. I am sorry the old man is dead, dead before I could give him due credit.

Indeed we must start with Gartner's theory, which I now consider proved: that the horizontal line, or dash, was a non-phonetic symbol of the ancient Bactrian divinity, derived from its incarnation as a snake. The discovery last month of some tablets from about 2500 B.C. furnish the proof. On them the sign appears sometimes singly,

often by twos, threes, and fives, almost always in arrangements of less than seven. Previously we had always considered such small groups as fragments, or fakes. While it is true that on these tablets many of the dashlike strokes vary considerably from strict horizontality, this is nothing new, and in any case the deformations have no significance — since there was but one sign, its shape could deviate from the norm without danger of ambiguity. Is there any chalk available? Good, let me show you —

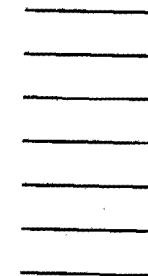


and so forth: all one and the same thing.

So here we have without any doubt a people whose scriptural apparatus comprised one symbol, a stylized pictogram of their god, arbitrary, particular, charged with connotations that we cannot hope to disclose. This was Gartner's discovery and it is a fine one. But it ends where it begins, and its usefulness is limited to the very first, most primitive period of Bactrian written culture. For Gartner refused to explore any possible extension, evolution, or modification of the initial significance that he had rightfully attributed to the symbol. He would not even admit that the dash might have come to stand — and what could be more logical? — for the *name* of the god as well as for the god himself; this would have meant acknowledging that the dash had gained a rudimentary phonetic power. Such obstinacy led to the complete breakdown of his reasoning powers when he came to consider the Early Second Period of Bactrian civilization (about 2000 to 1850 B.C.).

bb

Except for one or two fragmentary examples, all the materials of the Early Second Period (tablets, seals, etcetera) show the dash assembled into vertical groups of seven, so:



Gartner, and all other scholars until myself have followed him, saw in these columns only a multiplication of the original symbol, and they consequently interpreted them as mere reduplications or intensifications of its prime significance. In other words they saw in them only a quantitative transformation of identity. But the fact is, the dashes are *not* identical.

Again I must eliminate any thought of giving importance to physical variations of the sign. It is incredible how scholars persist in dashing down this well-pounded dead-end street, even though our oldest testimony on the original Bactrians, a paragraph in Herodotus, excludes all doubt on the subject: "The few remaining Old Bactrians say that until the time of the calamity they wrote with a single letter. Some attribute their demise to the abandonment of the original practice." No, when I say that the dashes when grouped by sevens are not alike, I mean simply this. The dash at the bottom is, uniquely, the dash at the bottom. The one above it is not at the bottom, and by that virtue is unlike the first. The one above that is similarly distinct from

the two below it. So it goes through the topmost one.

If I can claim to have had an original idea, this is it. It is certainly not one that presupposes arcane knowledge of any sort, or a departure from common modes of thought. But because it was new and because the rest of my hypothesis flowed naturally from it, it was denounced as fantastic by most of my colleagues, and it brought me years of dispute and abuse. I cannot go into all that argument here. Ultimately the confrontations were useful, led me to new truths, and helped me refine those already discovered. I can only summarize the facts that issued from that long and difficult time, omitting the sometimes lucky, sometimes devious ways by which I came to them.

We have therefore a group of seven symbols identical in form but distinguished from one another by position. It was highly probable, once one had posited a phonetic significance to this differentiation (pictogrammatic and thus conceptional distinctions were excluded by the visual equivalence of the signs), that the ancient Bactrians like their neighbors indicated only the consonants of the words they transcribed; and while it was impossible to be sure exactly which consonants were represented by the dashes, extrapolation from later texts was able to establish the classes of consonants that could be assigned them, thus:

_____	k	(h)
_____	l	(r)
_____	sh	(ch, j)
_____	t	(d, n)
_____	s	(z)
_____	f	(v)
_____	p	(b, m)

(For convenience I shall henceforth let the first letter stand for its class.) Next I discovered that vowels were also determined by position, that is, they were represented by the spaces between the dashes:

(a)

_____	a
_____	e
_____	i
_____	u
_____	o
_____	a

(a)

Finally, I learned that the symbols were to be read from the bottom up:

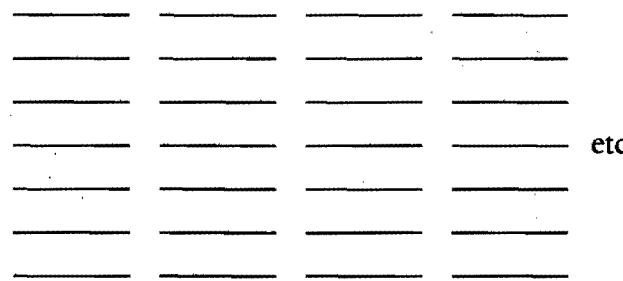
(a)

k
a
l
e
sh
i
t
u
s
o
f
a
p
(a)

= (a) pafosutishelak (a)

This was — schematically, approximately — the written word. It was of course *the* written word — no other could be set down, as a moment's reflection will show: there were seven characters to be sure, but only as a function of their place in a fixed sequence. Every word (so to speak) had to begin with *pa*, continue with *fo*, and so forth — hence only one word was possible. The unique case that defined the symbols was all they themselves could signify. Because of this singularity, I myself have no doubt that the seven dashes stood for the seven syllables of the Bactrian divinity. The first and only word was the first and only name, which was affixed to all things, so that all things bore the name of God.

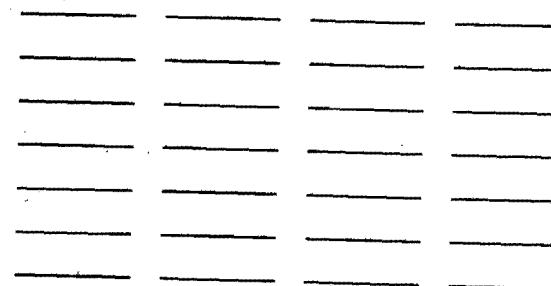
The first step in phonetic differentiation, which was albeit limited of crucial importance, was followed around 1850 B.C. (Middle Second Period) by a new development in Bactrian writing. Whereas until then only single groups of dashes are found, now several columns appear on the tablets and (another novelty) stones:



etc.

What can this signify? Isn't the answer obvious? We need only apply our experience of the Bactrian mentality to guess that as the position of the dashes in a column determined their function, so the positions

of the columns in a line determines theirs. It is a pity that this period of Bactrian writing is so shortlived and that we cannot with certainty say which of two possible forms this linear determination of meaning took: whether the words were all the same while their denotation silently varied; or whether the words themselves changed with their denotations. Although the latter alternative will seem more reasonable to us, there is no particular evidence to make us prefer it. For instance, the Fobsuk Stele reads:



and we know from a Sanskrit version on the back that the sense is "God copulates with the soul of mother," but it is by no means sure that, as my colleague Piotrovsky states, the corresponding words are

<i>mavozunijerah</i>	(of) mother
<i>apafozunijlaka</i>	heart
<i>amavosudishlah</i>	dig a well (in)
<i>pafosutishelaka</i>	god

although of course this would be quite possible in the later texts from which he derives his interpretation. They may simply be:

(a)pafosutishelak(a)

(a)pafosutishelak(a)

(a)pafosutishelak(a)

(a)pafosutishelak(a)

where the first (that is, rightmost) (a)pafosutishelak(a) would mean "god," the second "copulate with," the third "soul," and the last "mother."

The question is not an essential one. The fact is that the first group in a line has a given meaning, the second another one, and so on.

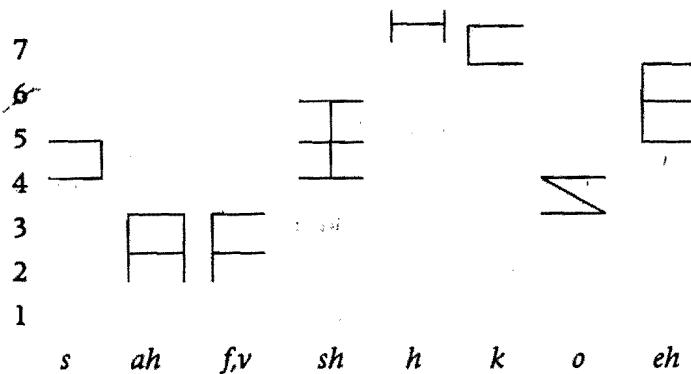
There was no theoretical limit to the number of columns that could be aligned, nor was the line itself a practical limit: the Bactrians soon learned to set rows of columns one above another to form a continuity. The longest text contains eighty-seven groups, in seven and a half rows. The majority of examples, however, range from four to seven columns. There are none with less than four. This is because the statements, whatever their length, were obliged to begin with the words "God copulates with the soul of (the) mother," this was in fact the cardinal sense of all declarations in the new writing, so that all its written utterances were inevitably religious in nature or at least given a strongly religious coloring by these opening words. In fact we may say that where in the first period Bactrian writing consisted of one divine name that was identified with all things, in the second period it consisted of a statement of one divine act that was identified with all acts. The change corresponds to that in religious belief from a magical to a moral god, to that in economy from agriculture to trade.

You will have noticed that in Piotrovsky's version of the Fobsuk

Stele, the *e* has in two of the four words fallen from the normal series of vowels. This is in accordance with the subsequent evolution of the Bactrian tongue and script. The unlimited possibilities of aligning groups, which differed radically from the earlier closed field of seven characters, evidently took the lid off the scribes' inventiveness. In a matter of two generations, by 1800 b.c., the system of uniform columns has broken down (Late Second Period). Groups were divided into fractions that represented an increasingly various number of phonetic objects, including vowels, diphthongs, and syllables:

7			
6			
5	—	—	—
4	—	—	—
3	—	—	—
2	—	—	—
1	—	—	—
	tch	baor	dir
			ha

These fractions lost more and more of their relation to the original sounds of the groups, and of course to the sacred meanings of the original words, or word. As the complexity of the script grew, vertical or diagonal marks were appended to the dashes to specify their functions, although the seven levels of the dashes were retained until a surprisingly late date. Thus a row of characters had the height of a row of columns:

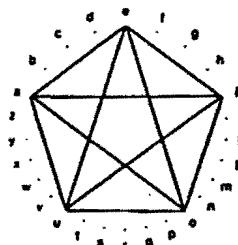


This last reminder of its origins disappeared from the alphabet (for such it now was) just before the destruction of the Bactrian state and the dispersion of its people. The history of their preservation of the script and its reemergence in Europe is the subject of my next book — and touching as your attentive faces are, I don't plan to give away any of its secrets today. But perhaps I may point out to you that ten Bactrian characters survive in the modern international alphabet of our own time; that they occupy the first six positions in it, as well as — and this is the most telling of all — the first and the last. This is history's certain homage to the unapproachable superiority of the Bactrians among the ancients in the domain of writing.

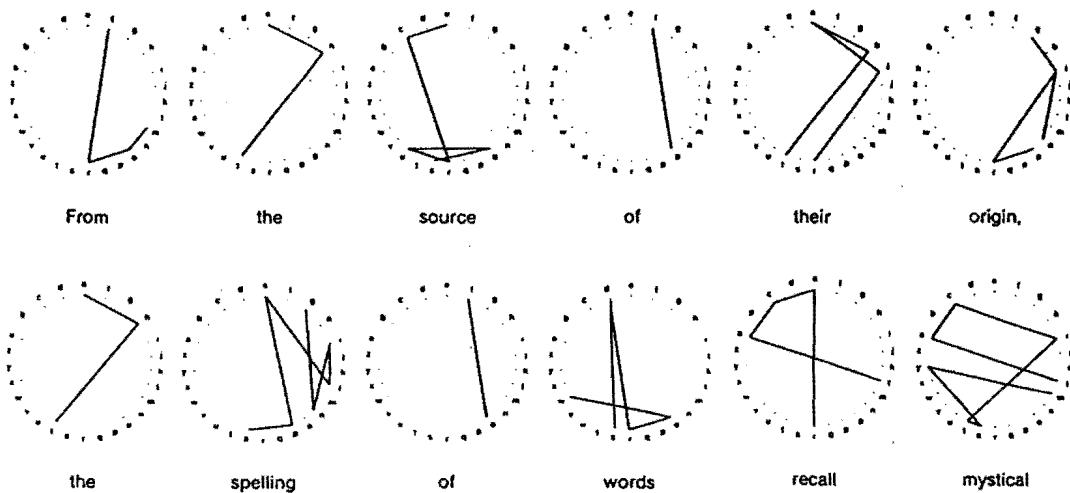
Of course Gartner would have none of this. He railed on to the end of his life, poor man, against everything I wrote. He was obsessed with the *shapes* of the sign! He even called me a "chauvinistic liar"! The words are preposterous, but after all not surprising, coming as they did — and this is something you boys should remember — from a man of the West.

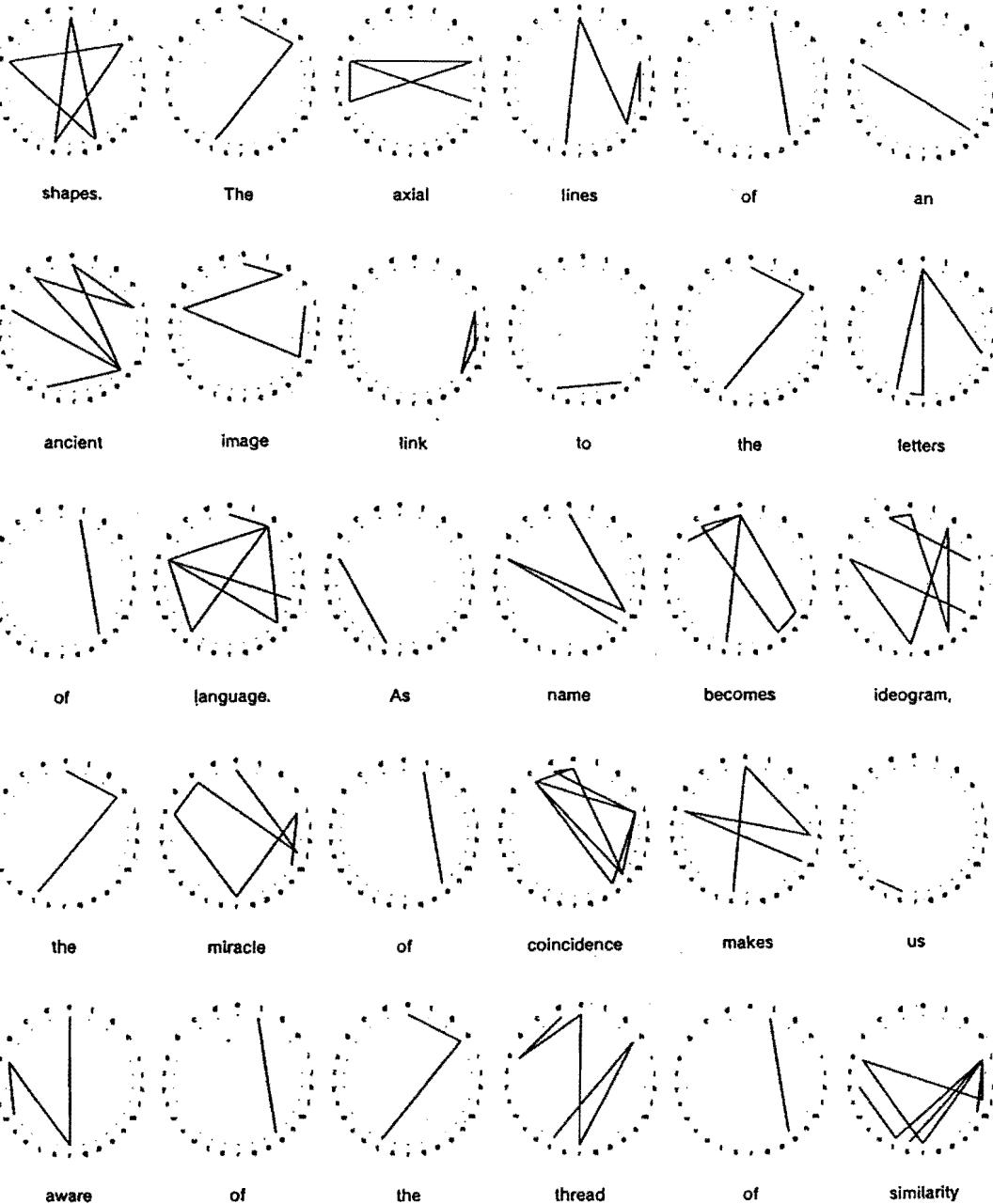
Where Signs Resemble Thoughts

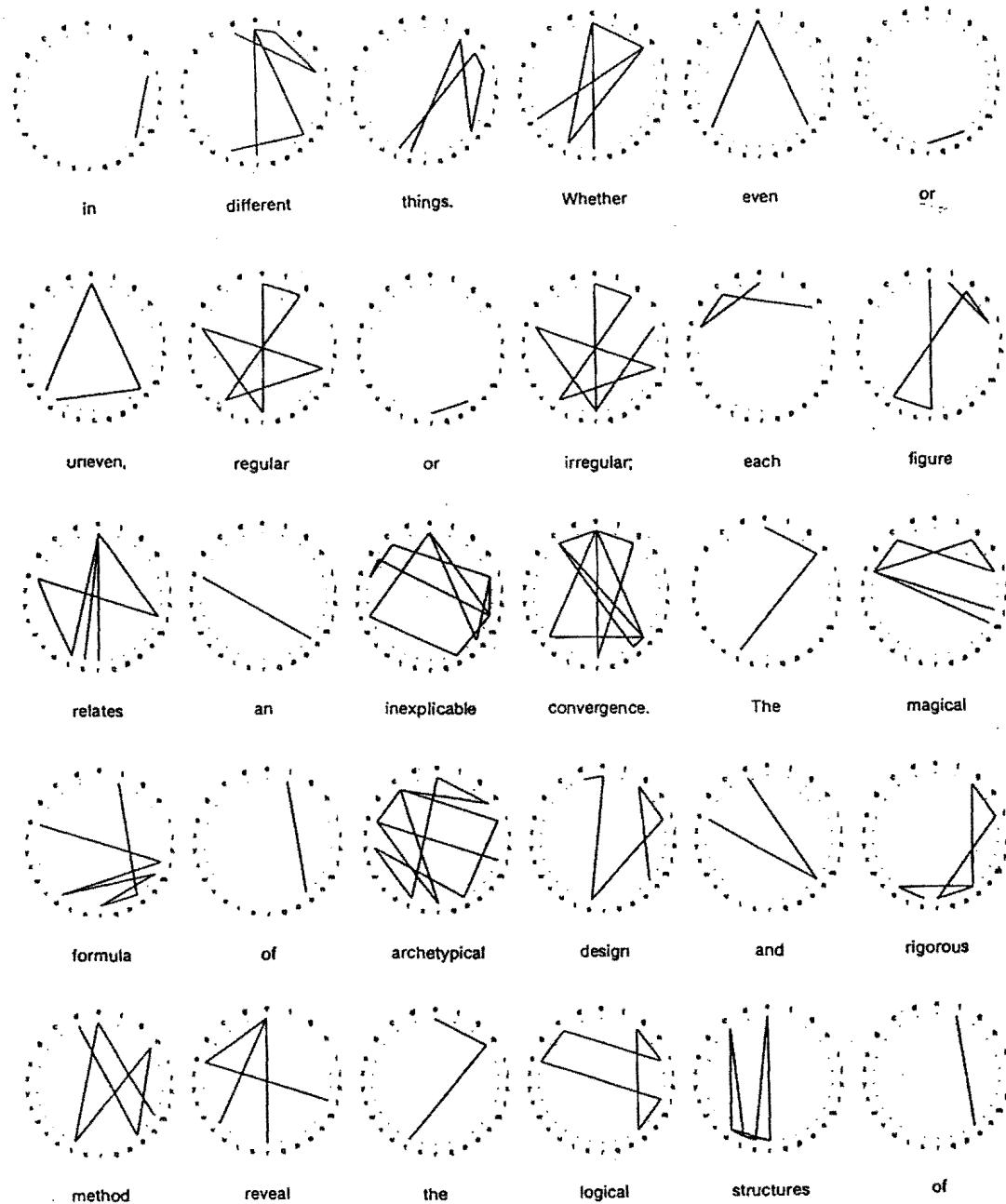
All of the "word-images" (ideographic images generated by the spelling of words) are produced from the same configuration or matrix of letter-points. The matrix is based on a circle of letters organized around a pentagram of vowels. Each of the twenty-six letters of the Alphabet is associated with a specific point on the perimeter of a circle. Lines are drawn to interconnect these letter-points according to the spelling of the word printed below each image.



a-e-i-o-u

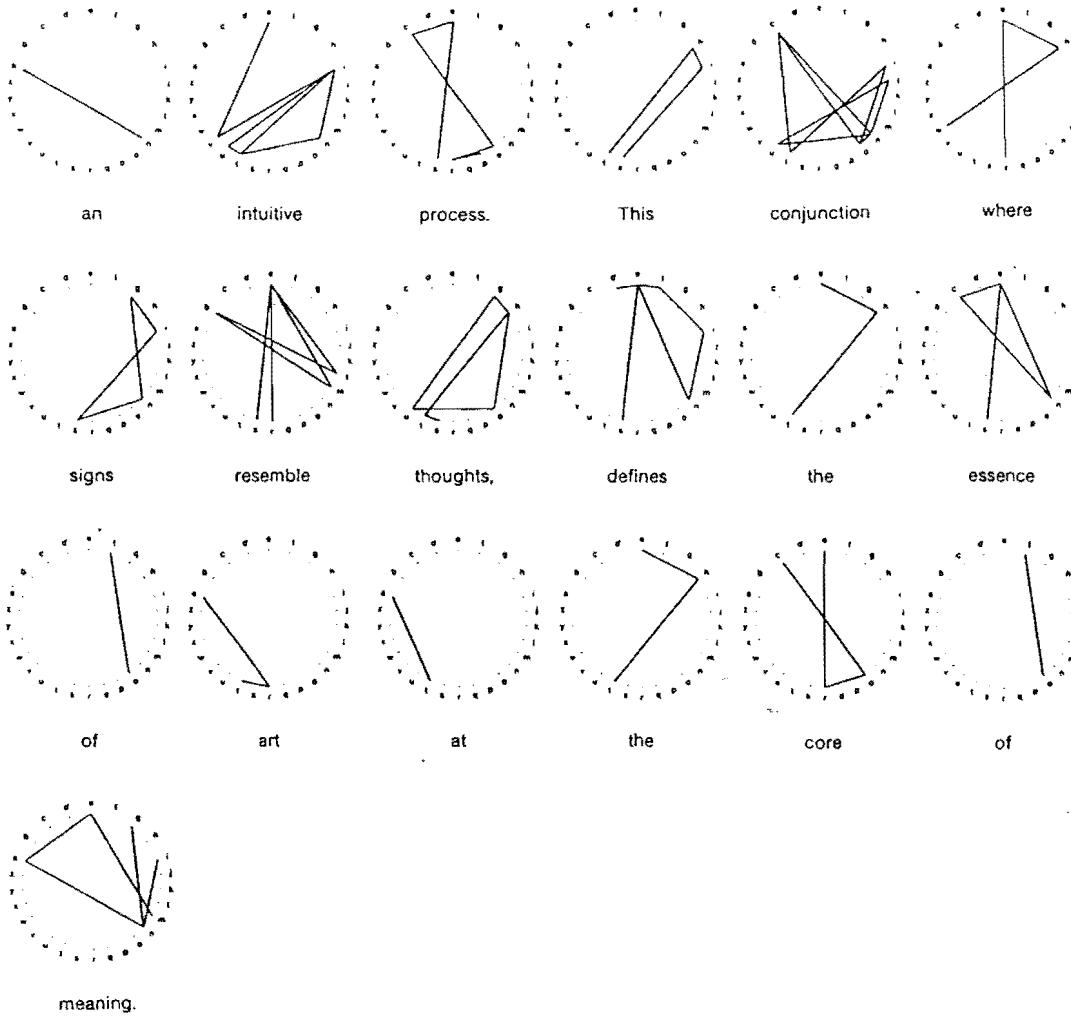






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Where Signs Resemble Thoughts



Michael Winkler

Don Pedro from his shirt has washed the fleas

✖.....➤

The bull's horns ought to dry it like a bone

✖.....➤

Old corned-beef's rusty armour spreads disease

✖.....➤

That suede ferments is not at all well known

✖.....➤

To one sweet hour of bliss my memory clings

✖.....➤

Signalling gauchos very rarely shave

✖.....➤

An icicle of frozen marrow pings

✖.....➤

As sleeping-bags the silent landscape pave

✖.....➤

Staunch pilgrims longest journeys can't depress

✖.....➤

What things we did we went the whole darned hog

✖.....➤

And played their mountain croquet jungle chess

✖.....➤

Southern baroque's seductive dialogue

✖.....➤

Suits lisping Spanish tongues for whom say some

✖.....➤

The bell tolls fee-less fi-less fo-less fum

The wild horse champs the Parthenon's top frieze

<.....>

Since Elgin left his nostrils in the stone

<.....>

The Turks said just take anything you please

<.....>

And loudly sang off-key without a tone

<.....>

To Parthenon you hold the charger's strings

<.....>

The North Wind bites into his architrave

<.....>

Th'outrageous Thames a troubled arrow slings

<.....>

To break a rule Britannia's might might waive

<.....>

Platonic Greece was not so talentless

<.....>

A piercing wit would sprightliest horses flog

<.....>

Socrates watched his hemlock effervesce

<.....>

Their sculptors did our best our hulks they clog

<.....>

With marble souvenirs then fill a slum

<.....>

For Europe's glory while Fate's harpies strum

- At snuff no Cornish sailorman would sneeze
 ✕ ➤
- His nasal ecstasy beats best Cologne
 ✕ ➤
- Upon his old oak chest he cuts his cheese
 ✕ ➤
- With cherry-pips his cottage floor is sown
 ✕ ➤
- The Frisian Isles my friends are cherished things
 ✕ ➤
- Whose ocean still-born herrings madly brave
 ✕ ➤
- Such merchandise a melancholy brings
 ✕ ➤
- For burning bushes never fish forgave
 ✕ ➤
- When dried the terrapin can naught express
 ✕ ➤
- Shallots and sharks' fins face the smould'ring log
 ✕ ➤
- While homeward thirsts to each quenched glass say yes
 ✕ ➤
- Lobsters for sale must be our analogue
 ✕ ➤
- On fish-slab whale nor seal has never swum
 ✕ ➤
- They're kings we're mammal-cousins hi ho hum

At five precisely out went La Marquise

x For tea cucumber sandwiches a scone

x Her native chauffeur waited in the breeze

x Which neither time nor tide can long postpone

x How it surprised us pale grey underlings

x When flame a form to wrath ancestral gave

x A daring baron pockets precious Mings

x Till firemen come with hose-piped tidal wave

x The fasting fakir doesn't smell the less

In Indian summers Englishmen drink grog

x The colonel's still escutcheoned in undress

x No need to cart such treasures from the fog

x The Taj Mahal has trinkets spice and gum

And lessors' dates have all too short a sum

From playboy Chance the nymph no longer flees

✗ ➤

Through snobbish growing round her hemline zone

✗ ➤

His toga rumpled high above his knees

✗ ➤

One gathers rosebuds or grows old alone

✗ ➤

Old Galileo's Pisan offerings

✗ ➤

Were pots graffiti'd over by a slave

✗ ➤

The leaning linguist cameramaniac sings

✗ ➤

Etruscan words which Greece and Rome engrave

✗ ➤

Emboggled minds may puff and blow and guess

✗ ➤

With gravity at gravity's great cog

✗ ➤

On wheels the tourist follows his hostess

✗ ➤

With breaking voice across the Alps they slog

✗ ➤

Do bank clerks rule their abacus by thumb?

✗ ➤

In cognac brandy is Bacardi rum?

He bent right down to pick up his valise

✗ ➤

That hordes of crooks felt they'd more right to own

✗ ➤

He bent right down and well what did he seize

✗ ➤

The thumb- and finger-prints of Al Capone

✗ ➤

Oh how oh how he hates such pilferings

✗ ➤

Filching the lolly country thrift helped save

✗ ➤

He's gone to London how the echo rings

✗ ➤

Through homestead hillside woodland rock and cave

✗ ➤

The peasant's skirts on rainy days she'd tress

✗ ➤

And starve the snivelling baby like a dog

✗ ➤

Watching manure and compost coalesce

✗ ➤

One misses cricket hearth and croaking frog

✗ ➤

Where no one bothered how one warmed one's bum

✗ ➤

Yet from the City's pie pulled not one plum

When one with t'other straightaway agrees

✗ ➤

The answer is they could be twins full-grown

✗ ➤

Replies like this the dumbstruck brain may tease

✗ ➤

Normal one aims to be *and* share the throne

✗ ➤

And yet 'twas he the beggar Fate just flings

✗ ➤

Rejecting ermine to become a knave

✗ ➤

The fertile mother changelings drops like kings

✗ ➤

In purest cradles tha's how they behave

✗ ➤

The genealogist with field and fess

✗ ➤

With quill white-collared through his life will jog

✗ ➤

To prove mamma an adult with a tress

✗ ➤

But *I* can understand you Brother Gog

✗ ➤

And let you off from your opinions glum

✗ ➤

A wise loaf always knows its humblest crumb

Prose took the minstrel's verse without a squeeze

✗ ➤

His exaltation shocked both youth and crone

✗ ➤

The understanding critic firstly sees

✗ ➤

'Ere meanings new to ancient tribes are thrown

✗ ➤

They both are right not untamed mutterings

✗ ➤

That metred rhyme alone can souls enslave

✗ ➤

They both are right not unformed smatterings

✗ ➤

That every verbal shock aims to deprave

✗ ➤

Poetic licence needs no strain or stress

✗ ➤

One tongue will do to keep the verse agog

✗ ➤

From cool Parnassus down to wild Loch Ness

✗ ➤

Bard I adore your endless monologue

✗ ➤

Ventriloquists be blowed *you* strike me dumb

✗ ➤

Soliloquies predict great things old chum

The acid tongue with gourmet's expertise

✗.....➤

Licks round carved marble chops on snails full-blown

✗.....➤

The showman gargles fire and sword with ease

✗.....➤

While sharks to let's say potted shrimps are prone

✗.....➤

The roundabout eats profits made on swings

✗.....➤

Nought can the mouse's timid nibbling stave

✗.....➤

In salads all chew grubs before they've wings

✗.....➤

The nicest kids for stickiest toffees crave

✗.....➤

The wolf devours both sheep and shepherdess

✗.....➤

A bird-brain banquet melts bold Mistress Mog

✗.....➤

The country lane just thrives on farmyard mess

✗.....➤

Whiskey will always wake an Irish bog

✗.....➤

Though bretzels take the dols from board-room drum

✗.....➤

Fried grilled black pudding's still the world's best yum

The marble tomb gapes wide with jangling keys

✗ ➤

When masons clutch the breath we held on loan

✗ ➤

Forms shadowy with indecision wheeze

✗ ➤

And empty cages show life's bird has flown

✗ ➤

It's one of many horrid happenings

✗ ➤

With sombre thoughts they grimly line the nave

✗ ➤

Proud death quite il-le-gi-ti-mate-ly stings

✗ ➤

Victorious worms grind all into the grave

✗ ➤

It's no good rich men crying Heaven Bless

✗ ➤

Or grinning like a pale-faced golliwog

✗ ➤

Poor Yorick comes to bury not address

✗ ➤

We'll suffocate before the epilogue

✗ ➤

Poor reader smile before your lips go numb

✗ ➤

The best of all things to an end must come

[Trans SC]

Oulipo Laboratory: Texts from the Bibliothèque Oulipienne. Trans. Harry Mathews, Warren F. Motte, Jr., and Iain White. Intro. Alastair Brotchie. London: Atlas, 1995. [Includes translations of François Le Lionnais's "Two Manifestos" and volumes 3, 20, 46, 62, 67, and 70 of the Bibliothèque Oulipienne.]

Notes

INTRODUCTION

1. In alphabetical order: Noël Arnaud, Jacques Bens, Claude Berge, Jacques Duchateau, Latis, François Le Lionnais, Jean Lescure, Raymond Queneau, Jean Queval, Albert-Marie Schmidt.

2. The new members: Marcel Bénabou, André Blavier, Paul Braffort, Italo Calvino, François Caradec, Ross Chambers, Stanley Chapman, Marcel Duchamp, Luc Etienne, Paul Fournel, Jacques Jouet, Harry Mathews, Michèle Métaïl, Georges Perec, Jacques Roubaud. It must be noted that the Oulipo draws no distinction between living and dead members; Italo Calvino, Marcel Duchamp, Luc Etienne, Latis, François Le Lionnais, Georges Perec, Raymond Queneau, and Albert-Marie Schmidt are now deceased.

3. See "Entretien: Perec / Jean-Marie Le Sidaner," *L'Arc* 76 (1979): 7. (All translations are mine unless otherwise specified.)

4. According to some, the first utterance on earth, addressed by Adam to Eve, was a palindrome: "Madam, I'm Adam." Although this theory may seem rather esoteric to non-Anglophones, it rejoins a broader tradition of myth which postulates the formal purity and rigor of original language. See Claude-Gilbert Dubois, *Mythe et langage au seizième siècle* (Bordeaux: Ducros, 1970).

5. See "Deux Principes parfois respectés par les travaux oulipiens," *Atlas de littérature potentielle*, 90. (For full references to Oulipian works, see the bibliographies in the foregoing section, "Oulipians and Their Works.")

6. "Entretien: Perec / Jean-Marie Le Sidaner," 8. In fact, only one of Perec's poems, entitled simply "Un Poème," seems to have been written freely. See his *La Clôture et autres poèmes*, 85.

7. See Paul Braffort, "Un Système formel pour l'algorithme littéraire," *Atlas de littérature potentielle*, 110.

8. See Harold Bloom, *The Anxiety of Influence* (New York: Oxford University Press, 1973), 14–16, 19–45; *Kabbalah and Criticism* (New York: Seabury, 1975), 25–27, 36–37, 54–55, 62–67, 78–79, 86–89, 122–23; *A Map of Misreading* (New York: Oxford University Press, 1975), 70–75, 84, 95–99, 106–09, 126, 149, 179, 195, 200; *Poetry and Repression* (New Haven: Yale University Press, 1976), 1, 16–21, 47, 66, 99–100, 124–26, 164, 183, 223, 248–49; *Agon: Toward a Theory of Revisionism* (New York: Oxford University Press, 1982), 200–223; *The Breaking of the Vessels* (Chicago: University of Chicago Press, 1982), 23–31. See also Michel Serres, *La Naissance de la physique dans le texte de Lucrèce: Fleuves et turbulences* (Paris: Minuit, 1977), and "Lucretius: Science and Religion," in *Hermes: Literature, Science, Philosophy*, ed. Josué V. Harari and David Bell (Baltimore, Md.: Johns Hopkins University Press, 1982), 98–124; Jeffrey Mehlman, *Cataract: A Study in Diderot* (Middletown, Conn.: Wes-

leyan University Press, 1979), esp. 1-32. Essays from the Thom polemic are offered in *Sub-Stance* 40 (1983).

9. "Entretien: Perec / Ewa Pawlikowska," *Littératures* 7 (1983): 70-71.

LIPO: FIRST MANIFESTO

1. How can sap rise in a debate? We shall leave this question aside, since it arises not from poetry but from vegetal physiology.

2. The Lettrists, as the name suggests, focused their aesthetics on the alphabetical letter. See Isidore Isou, *Le Lettrisme et l'hypergraphie dans la peinture et la sculpture contemporaines* (Paris: Grassin, 1961), *Les Champs de force de la peinture lettriste: Nouvelles Précisions sur la mécanique, le [sic] matière, le rythme et l'anecdote de l'hypergraphie* (Paris: R. Altmann, I. Isou, 1964), and *Ballets ciselants polythanasiques, hypergraphiques et infinitésimaux* (Paris: R. Altmann, I. Isou, 1965). See also Maurice Lemaître, *Le Lettrisme devant Dada et les nécrophages de Dada!* (Paris: Centre de Créativité, 1967) and *Le Lettrisme dans le roman et les arts plastiques, devant le "pop-art" et la bande dessinée* (Paris: Centre de Créativité, 1970). The latter constitutes the first number of the review *Lettrisme*, published by the Centre de Créativité. For a history of the movement, see Jean-Paul Curtay's excellent *La Poésie lettriste* (Paris: Seghers, 1974), esp. 68-98. (WM)

3. The Russian mathematician A. A. Markov (1856-1922), principally known for his work in theory of probability. (WM)

4. Raymond Queneau's *Cent Mille Milliards de poèmes*, discussed in the Introduction to the present volume. Boolean haikus: a literary application of the work of the British mathematician George Boole (1815-64). See François Le Lionnais, "Poèmes booléens" and "Théâtre booléen," *La Littérature potentielle*, 262-66 and 267-68. (WM)

5. "Crows, foxes" may be an allusion to La Fontaine's fable, "The Crow and the Fox." Nonetheless, François Le Lionnais was genuinely interested in animal language, and proposed to the Oulipo on 1 July 1963 that the group undertake to write poems using only those human vocables understood by certain animals: poems for dogs, for crows, for foxes, and so forth. This provoked the following exchange:

Jean Lescure: "One of my clients, who trains racehorses, told me one day that he often reads Baudelaire to his horses, and they seem to adore it. . . ."

Raymond Queneau: "That's what's called doping. It's because of Baudelaire that Off-Track Betting is going to Hell in a basket."

See Jacques Bens, *Oulipo 1960-1963*, 230-31. As to Algol, both Le Lionnais and Noël Arnaud experimented in the 1960s with Algol poems. See Le Lionnais, "Ivresse algolique," *La Littérature potentielle*, 217-22; Arnaud, "Poèmes algol," *La Littérature potentielle*, 223-27; and Bens, *Oulipo 1960-1963*, 54-55. (WM)

6. A fine autoreferential example of Villon's acrostics is furnished by the *envoi* of the "Ballade des contre-vérités":

Voulez vous que verté vous die?
Il n'est jouer qu'en maladie,
Lettre vraie que tragédie,
Lâche homme que chevalereux,
Orrible son que mélodie,
Ne bien conseillé qu'amoureux.

(Shall I tell you the truth?
There is no joy except in sickness,
No truth except in tragedy,
No coward like a brave man,
No sound more horrible than melody,
No wisdom except that of lovers.)

On the use of acrostics in Psalms and Lamentations, see Ralph Marcus, "Alphabetic Acrostics in the Hellenistic and Roman Periods," *Journal of Near Eastern Studies* 6 (1947): 109-15. Auguste Herbin (1882-1960) was a French painter. The B.A.C.H. acrostic was used by Bach in the theme of the last fugue of his *Art of the Fugue*; it was later adopted in works by Liszt, Schumann, Reger, and Barblan. See Albert Schweitzer, *J. S. Bach* (New York: Macmillan, 1935), I, 425. (WM)

SECOND MANIFESTO

1. A systematic exploration of the detective novel has already been undertaken in this perspective. [See François Le Lionnais, "Les Structures du roman policier: Qui est le coupable?" and Jacques Duchateau, "Lecture marginale de Peter Cheyney," *La Littérature potentielle*, 66-69 and 70-74, respectively. (WM)]

2. This is a bilingual homophonic translation of the first line of Keats's *Endymion*: "A thing of beauty is a joy for ever." Le Lionnais's ejaculation can be literally (if nonhomophonically) translated as: "A beautiful monkey is a toy for winter." (WM)

BRIEF HISTORY OF THE OULIPO

1. The Collège de Pataphysique takes its name from "pataphysics," the discipline proposed by Alfred Jarry, which he defined in his *Gestes et opinions du Docteur Faustroll* (II, viii) as "the science of imaginary solutions." Jarry himself spelled the word with an initial apostrophe, perhaps to suggest *épataphysique*, or "shocking physics." The Collège itself was founded on 11 May 1948, the fiftieth anniversary of *Faustroll*; its principal (if by no means exclusive) function is to promote work on Jarry. Publications of the group include the *Cahiers du Collège de Pataphysique* and the *Dossiers du Collège de Pataphysique*. See Linda Klieger Stillman, *Alfred Jarry* (Boston: Twayne, 1983), 41-42. Several of the founding members of the Oulipo held titles within the Collège de Pataphysique: Queneau, for example, was a Transcendent Satrap; Latis was the Private General Secretary to the Baron Vice-Curator; Noël Arnaud is the Regent of General Pataphysics and

the Clinic of Rhetoriconosis, as well as Major Conferant of the Order of the Grande Gidouille. (WM)

2. See Noël Arnaud, "Et naquit l'Ouvroir de Littérature Potentielle," in Jacques Bens, *Oulipo 1960-1963*, 8. (WM)

3. Raymond Queneau's first novel, published by Gallimard in 1933. (WM)

4. In the penultimate quatrain of his "Booz endormi," Victor Hugo rhymes *Jérimadeth* with *se demandait*. As the former place name figures in no known atlas, it has been conjectured that *Jérimadeth* may be read as *je rime à dait*, or "I rhyme with dait." (WM)

5. According to Bens's minutes, this meeting took place not on April 5 but on April 17. See *Oulipo 1960-1963*, 42-43. (WM)

6. Again, according to Bens, the date of the meeting was not April 20 but April 28. See *Oulipo 1960-1963*, 45-52. (WM)

7. Lady Godiva was a female tortoise who lived in François Le Lionnais's garden. See *Oulipo 1960-1963*, 71. (WM)

8. Baudelaire, of course.

9. Years become centuries in Oulipospeak. (WM)

10. Let us recall the names of the old ones: Noël Arnaud, Jacques Bens, Claude Berge, Paul Braffort, Jacques Duchateau, François Le Lionnais, Jean Lescure, Raymond Queneau, Jean Queval. Foreign correspondents: André Blavier, Ross Chambers, Stanley Chapman.

RULE AND CONSTRAINT

1. Queneau's attack was directed against André Breton and orthodox surrealism; see also "Raymond Queneau and the Amalgam of Mathematics and Literature" and "Mathematics in the Method of Raymond Queneau." Queneau, distressed by Breton's autocratic rule, left the surrealist group. Along with Jacques Baron, Georges Bataille, J.-A. Boiffard, Robert Desnos, Michel Leiris, Georges Limbour, Max Morise, Jacques Prévert, Georges Ribemont-Dessaignes, and Roger Vitrac, Queneau signed *Un Cadavre*, the 1930 pamphlet condemning Breton. Its language is very vituperative (if perhaps not quite as harsh as certain passages of Breton's *Second Manifesto*); the most commonly occurring epithets are *flic* (cop) and *curé* (priest). See Maurice Nadeau, *Histoire du surréalisme* (Paris: Seuil, 1964), 131-37. (WM)

2. Bénabou is of course alluding to *La Disparition*. (WM)

3. This diagram, previously unpublished, was furnished by Marcel Bénabou as a complement to "Rule and Constraint." The three circles should be imagined as rotating freely; thus, in elaborating a given structure, any combination of linguistic object, semantic object, and operation is possible. (WM)

THE COLLÈGE DE PATAPHYSIQUE AND THE OULIPO

1. See "Brief History of the Oulipo," n. 1. The text here translated served as the introduction to a body of work submitted by the Oulipo to the Collège de Pataphysique. (WM)

2. "Art is long! And life so short," *Faust*, I, 558-59. (WM)

3. See "Brief History of the Oulipo," n. 1. (WM)

POTENTIAL LITERATURE

1. A group of French mathematicians who worked and published collectively under the pseudonym of Nicolas Bourbaki. Principally dealing with set theory, Bourbaki's work was highly influential for the amateur and professional mathematicians in the Oulipo. (WM)

2. See Georges Perec's "History of the Lipogram" for discussions of these figures and their lipogrammatic works. (WM)

3. The philosopher H. M. Sheffer, who taught at Harvard, published a paper in 1913 in which he reduced all the symbols of sentential logic (e.g., "and," "or," "not," "if/then,") to a single stroke. Queneau evokes the Sheffer Stroke as a model of methodological elegance. (WM)

4. The German mathematician George Cantor (1845-1918), known for his work on the theory of numbers. (WM)

5. Literally, "leaves," "sun," "fickle," "banks," "vermilion," "sleep." (WM)

6. The catalogue of the Bibliothèque Nationale informed me that in 1867 he had published *L'Arithmétique de Mademoiselle Lili*.

7. Keith Bosley, in *Mallarmé: The Poems* (Harmondsworth: Penguin, 1977), 167-69, translates the sonnet as follows:

Will lovely, lively, virginal today
Shatter for us with a wing's drunken bow
This hard, forgotten lake haunted in snow
By the sheer ice of flocks not flown away!

A swan that was remembers it is he
Hopelessly yielding for all his fine show
Because he did not sing which way to go
When barren winter beamed its apathy.

His neck will shake off that white agony
Space deals out to the bird that will deny,
But not earth's horror where the plumes are clamped.

A ghost whom to this place his lights assign,
He stiffens in the cold dream of contempt
Donned amid useless exile by the Swan. (WM)

8. Here, I again rely on Keith Bosley (169-71):

While high her sheer nails offer up their pink
Agate this midnight, lanternary Anguish
Upholds a crowd of evening dreams now sunk
In phoenix fires: no urn gathers their ash

Notes to Pages 60–61

On sideboards in the empty room, no conch,
No cancelled trinket resonantly foolish
(The Master took it to the Styx to drink
Tears for the Void regards all else as trash).

But near the blank north casement a gold gash
Gasps where perhaps painted unicorns lash
Fire cornering a nymph, dead, naked, lank

In the mirror, while still in the frame's ambush
Obliviously embraced, the septet wink
And forthwith in their distant fastness flash. (WM)

9. The entire text of Athalie's dream (from Racine's *Athalie*, II, v) is as follows:

C'était pendant l'horreur d'une profonde nuit.
Ma mère Jézabel devant moi s'est montrée,
Comme au jour de sa mort pompeusement parée.
Ses malheurs n'avaient point abattu sa fierté;
Même elle avait encor cet éclat emprunté
Dont elle eut soin de peindre et d'orner son visage,
Pour réparer des ans l'irréparable outrage.
Tremble, m'a-t-elle dit, fille digne de moi.
Le cruel Dieu des Juifs l'emporte aussi sur toi.
Je te plains de tomber dans ses mains redoutables,
Ma fille. En achevant ces mots épouvantables,
Son ombre vers mon lit a paru se baisser;
Et moi, je lui tendais les mains pour l'embrasser.
Mais je n'ai plus trouvé qu'un horrible mélange
D'os et de chair meurtris, et traînés dans la fange,
Des lambeaux pleins de sang, et des membres affreux. . . .

Samuel Solomon's translation of this passage, from *Jean Racine: Complete Plays* (New York: Random House, 1967), II, 400, is as follows:

It was a brooding, horror-breathing night.
My mother Jezebel appeared before me,
Arrayed in pomp, as on the day she died.
Her pride was quite untamed by her misfortunes;
Immaculate as ever were the unguents
With which she never failed to deck her face
To hide the hideous ravages of time.
“Tremble,” she said to me, “my worthy daughter.
You, too, the cruel Jewish God must slaughter.
I pity you, when in His fearful hands
You fall, my child.” With these words, big with dread,
Her spirit seemed to lean towards my bed;
And I, I stretched my hands out to embrace her.
Yet all I found was but a horrid mush

Notes to Pages 61–67

Of bones and mangled flesh, dragged in the slush,
Of bloody strips, and limbs all shameless scarred. . . . (WM)

10. The efficacy of transformations of this sort depends largely on the shock they produce as they run into the original: that is, the reader must ideally “hear” the original and the transformation simultaneously, and the latter must jar the former (this is also true of the S + 7 Method). To produce this effect, the *untransformed* part of the new text (in Queneau's example, the vocalic structure) must follow the original faithfully. Granted this, literal translation of the passage would not be effective. (WM)

11. Named after Leonardo of Pisa, also known as Fibonacci, a thirteenth-century Italian mathematician, author of *Liber Abaci*. In a Fibonacci series, the first two terms are chosen arbitrarily (although by convention they are generally either 0 and 1 or 1 and 1); each term thereafter is the sum of the two preceding terms, for example, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, etc. Perhaps Fibonacci's greatest achievement was his popularization in the Western world of the Hindu-Arabic numerals. (WM)

12. According to François Le Lionnais, Estoup was a stenography teacher in the early part of this century who, while doing research for a treatise on the frequency of words, discovered a law. Raymond Queneau formulated the latter as follows: “The place of a word in the list ordered according to frequencies is constant when multiplied by its own frequency.” Queneau's evocation and attempted explanation of this law at an early meeting of the Oulipo was met, according to Jacques Bens, by glassy-eyed incomprehension. See *Oulipo 1960–1963*, 42, 88, 90–91. (WM)

13. Text of a lecture delivered in M. J. Favard's Quantitative Linguistics Seminar on 29 January 1964. The activity of the Ouvroir de Littérature Potentielle having grown considerably since then, this report of its work is already dated.

On the Oulipo, see F. Le Lionnais, preface to *Cent Mille Milliards de poèmes*; R. Queneau, *Entretiens avec Georges Charbonnier*; dossier 17 of the *Cahiers du Collège de Pataphysique*; numbers 66–67 of *Temps Mêlés*.

I recall the names of the members of the Oulipo: Noël Arnaud, Jacques Bens, Claude Berge, Jacques Duchateau, Latis, François Le Lionnais, Jean Lescure, Jean Queval, A.-M. Schmidt, and foreign residents: André Blavier, Paul Braffort, Stanley Chapman, Ross Chambers, and Marcel Duchamp.

The reader will find a more developed account of the matrical analysis of language in an article (to appear) in *Etudes de linguistique quantitative*, no. 3, published by the Faculté de Lettres et des Sciences humaines of the University of Besançon.

QUENEAU OULIPIAN

1. Claude Simonnet, *Queneau déchiffré* (Paris: Julliard, 1962), 13–14.
2. Claude Simonnet, *ibid.*

3. Paul Gayot, "Madagascar et Valentin Brû," *Dossiers du Collège de Pataphysique* 20.

4. Paul Gayot, "A travers le Paris de Zazie et de Valentin Brû," *ibid.*

5. This article originally appeared in *L'Arc* 28 [1966] under the title "Littérature Potentielle."

RAYMOND QUENEAU AND THE AMALGAM OF MATHEMATICS AND LITERATURE

1. Christian Goldbach was a Russian mathematician who conjectured in a letter to Leonhard Euler in 1742 that every even integer greater than four could be expressed as the sum of two odd prime numbers. His conjecture is an example of "incomplete induction" since, although it has never been proved false, it cannot be verified for *every* even integer greater than four. The Prussian mathematician F. Klein (1849–1925) proposed the "Erlanger Program" in 1872. It drastically modified the existing classification of geometry and remained the authoritative model for nearly fifty years. It was finally rendered obsolete by the new geometries that followed the general theory of relativity (1916). (WM)

2. The "Disparate Luncheons" (for instance, several years ago, the one with Pierre Auger, François Jacob, André Lichnerowicz, Stanislas Ulam), the "Mathematical Luncheons" (for instance, in the spring of 1976, with Henri Cartan, Nicolaas Kuiper, Casimir Kuratowski, Christine Phili), and other agapes.

3. He was an honorable member of the "Confrérie des Dégustateurs de Nombres," which I founded some years ago (but which has never met).

4. S, because s is the first letter of "sum."

5. E. Waring (1734–98), an English mathematician specializing in number theory, conjectured in 1770 that every integer $n > 0$ is the sum of a fixed least number $g(s)$ of the s th power of integers ≥ 0 . (WM)

6. Mathematicians who are richly informed about and passionately interested in art and poetry are far more numerous.

7. October third being both Janine's birthday and my own, we used to celebrate it by dining together with, at the most, our spouses; presents of ties and delicacies, and quatrains ("October" rhyming with "sober").

8. See François Le Lionnais, "Poèmes booléens," *La Littérature potentielle*, 262–66. (WM)

9. The allusion is to André Breton and the surrealist group; see "Rule and Constraint," n. 1. (WM)

10. It is not a question of *cadavres exquis*. Queneau's patent guarantees, in addition to the conservation of the rhyme (which is not at all extraordinary), the conservation of syntactic coherence (that is Oulipian) and aspires to the conservation of a semantic atmosphere (which is Quenellian).

11. It has already fostered works in France by Monique Bringer, Georges Guillaud, and Jacques Roubaud, as well as works by American mathematicians.

12. This article was originally published in *Nouvelle Revue Française* 290 [1977].

MATHEMATICS IN THE METHOD OF RAYMOND QUENEAU

1. François Le Lionnais, "Raymond Queneau et l'amalgame des mathématiques et de la littérature," *Nouvelle Revue Française* 290 (1977): 76. ["Raymond Queneau and the Amalgam of Mathematics and Literature" appeared in the *Nouvelle Revue Française* prior to its publication in *Atlas de littérature potentielle*. (WM)]

2. See "Conjectures fausses en théorie des nombres," *Bords*, Hermann, 1963, 31–36.

3. *Bords*, 34.

4. *Bords*, 82.

5. *Critique*, 176 (1962). Reprinted in *Bords*. [By "right here," Roubaud means the journal *Critique*, where "Mathematics in the Method of Raymond Queneau" was published prior to its publication in *Atlas de littérature potentielle*. (WM)]

6. *Bords*, 12.

7. *Bords*, 29.

8. In the *Proceedings of the Académie des Sciences*.

9. Vol. 12, no. 1, January 1972.

10. See the first sixteen terms of the series 1.1.1.2. in the article cited above, 39.

11. This is a conscious choice: see, for example, in the article on the *s*-additive series, the remark on page 64: "For $s^1 = 1$, we discover with pleasure Fibonacci's numbers." These numbers, long linked to esthetic speculations, figure, for example, in the great medieval Georgian courtly work, *The Knight in the Tiger Skin*.

12. Reprinted in the "Queneau" issue of *L'Herne*.

13. *Bâtons, chiffres et lettres*, 340. [See Queneau's "Potential Literature." (WM)]

14. Or previously, perhaps, to the idea of matrical analysis, I do not know.

15. Reprinted in *Cahiers de l'Herne*.

16. "The black sun of melancholy" is an allusion to Gérard de Nerval's sonnet "El Desdichado," line 4, which is itself an allusion to Albrecht Dürer's *Melancholia*. (WM)

17. Notably, in the work of P. Braffort and J. Bens.

18. The issue of 29 *sable* 93, 79.

19. The quotation is from Pound's *Spirit of Romance*, ch. 2. (WM)

20. These are not the only "mutations" in the poem.

21. In J. Roubaud, *Etoffe* (Zurich: G. K. Editions, 1974).

22. G. Perec, *Ulcérations*, Bibliothèque Oulipienne 1.

23. See Claude Berge's article, "Pour une analyse potentielle de la littérature combinatoire," in Oulipo, *La Littérature potentielle*, "Idées," Gallimard, and, in the same volume, Queneau's article, "La Relation X prend Y pour Z." [Both articles appear in the present collection. (WM)]

24. Article cited, 63.

25. Bibliothèque Oulipienne 2.

26. See the book cited, note 23, principally Jean Lescure's historical article and

- François Le Lionnais's two "manifestoes." [All three pieces appear in the present collection. (WM)]
27. "Littérature potentielle," in *Bâtons, chiffres et lettres*, 317.
 28. Article cited, n. 27, 322.
 29. Article cited, 323.
 30. F. Le Lionnais, "Premier manifeste," in *La Littérature potentielle*, 20.
 31. See n. 27. [See also Georges Perec's "History of the Lipogram." (WM)]
 32. G. Perec, "Histoire du lipogramme."
 33. *Lettres Nouvelles*, 1969.
 34. *La Disparition*, 1.
 35. See the texts cited in nn. 27 and 32.
 36. *La Disparition*, 296. The disappearance of the *e* elicits an effervescence of punctuation. [Queneau's text also appears in *La Littérature potentielle*, 98. (WM)]
 37. Queneau's table was published in *Atlas de littérature potentielle*, 74-77. (WM)
 38. It is impossible for me to offer any more details, since these belong to the Oulipo.
 39. Article cited, 322.
 40. *Le Voyage en Grèce*, 94.
 41. See section 4.
 42. See also the testimony of F. Le Lionnais in the *Nouvelle Revue Française*: "A fan of whole numbers cannot help but yearn to confront the horrors and delights of those rebel angels, the prime numbers."
 43. This position remains of current interest, if one may judge from certain recent oafish statements about the "Fascism" of language.
 44. Gallimard.
 45. J. Roubaud, *Mezura*, Editions de l'Atelier, 1976.
 46. Introduction to the *Poésie des ensembles*.
 47. Editions Caractères, 1958.
 48. Editions Gallimard, 1961.
 49. See *La Littérature potentielle* or *Bâtons, chiffres et lettres*.
 50. See P. Lusson's work in the Cercle Polivanov on these questions.
 51. The other basic example is of course Raymond Roussel's *Comment j'ai écrit certains de mes livres*.
 52. See "La Littérature sémo-définitionnelle," in *La Littérature potentielle*, 123.
 53. Bourbaki, introduction to *Topologie générale*.
 54. *Topologie générale*, ch. 1, 186.
 55. F. Le Lionnais is the representative, and almost the only one, of this tendency.
 56. Bibliothèque Oulipienne 3.
 57. Queneau, *Les Fondements de la littérature d'après David Hilbert*, 3.
 58. Id., *ibid.*, 4.
 59. Id., 13.
 60. Id., 12.

61. In the article "Technique du roman," *Bâtons, chiffres et lettres*, 33.
62. In the broad sense, the term "text" seems to be the term that most closely corresponds to "set," in its very great poverty.
63. See "Pour une analyse potentielle de la littérature combinatoire," *La Littérature potentielle*, 58. [Perec's work resulted in *La Vie mode d'emploi*. See also Perec, "Quatre figures pour *La Vie mode d'emploi*," *L'Arc* 76 (1979), 50-53. (WM)]
64. See Harry Mathews's experiments with Shakespeare's sonnets in "Mathews's Algorithm." (WM)
65. Not counting the places that advertise it.
66. *Bâtons, chiffres et lettres*, 29. The novels in question are *Le Chiendent*, *Gueule de Pierre*, and *Les Derniers Jours*.
67. *Odile*, 33.
68. We are not attacking the indivisibility of the man and the work.
69. See n. 11.
70. Still in "Technique du roman," in *Bâtons, chiffres et lettres*, 33.
71. This article was originally published in *Critique* 359 [1977].

HISTORY OF THE LIPOGRAM

1. Perec is alluding to Queneau's *Cent Mille Milliards de poèmes*. (WM)
2. Racine's *Phèdre*, line 1,112: "Le jour n'est pas plus pur que le fond de mon cœur" (The day is no more pure than my own heart). That this was the line Perec had in mind was confirmed by a personal letter from him to the editor in February 1982. (WM)
3. "It is shameful to have difficult trifles / And it is the foolish toil of buffoons." Martial, *Epigrams* II, 86, 9-10. (WM)
4. "I sing of Demeter and Kore, the bride of Klymenos." (WM)
5. Rittler speaks of twins, the Spanish also tell a story of brothers (*Los dos hermanos . . .*), and *La Disparition* tells the story of a large family: would the theme of brothers be somehow inherent to the lipogram?
6. Two translations are possible: "The enchantment struck down Apollo's son" and "I free Apollo's son from enchantment." (WM)
7. "And yet the R is a letter of the alphabet, a letter which recurs quite often, notwithstanding the paucity of our discourse. A letter which, although you might ignore all the others, cannot escape you. Now, of course, one can repeat that old and famous aphorism, NATURE IS CONQUERED BY ART." (WM)
8. "Various consequences of love, in five exemplary tales, and new devices for writing in prose and verse without one of the vowels." (WM)
9. "The vowel *e* is found in the majority of the most frequently used words in the language, such as . . . father, mother, benevolence . . . levity . . . jejune, pleasant, excellent . . . nevertheless . . . woe . . . zest!" (WM)
10. Literally (if not lipogrammatically) translated: "We camp in Malakoff, or rather, since Malakoff has entirely disappeared, neither seen nor heard, we camp where it used to rise up, so insulting (Vanity of vanities, all is vanity!)." (WM)

11. See Queneau's *L'Instant fatal*. (WM)
12. "The ancient power of language surges forth in the Lord's Prayer." (WM)
13. Efforts to locate the Conrad text and to identify the English female novelist have thus far failed to bear fruit. Marcel Bénabou suggested that Perec meant D. H. Lawrence rather than Conrad, but this cannot be confirmed. On the other hand, I am indebted to Bruce Kochis for an example of liponymy from Vladimir Mayakovsky: in his "About This," a poem of 1,500 lines about love, Mayakovsky never uses that word. The first part ends with a rhyme that seems to call for the word "love," whose absence is thus rendered conspicuous. See *Mayakovsky*, trans. and ed. Herbert Marshall (New York: Hill and Wang, 1965), 161-215. (WM)

RECURRENT LITERATURE

1. The authors wish to thank Bernard Jaulin and Pierre Rosenstiehl for their judicious advice.
2. The authors are referring to Jean Lescure's S + 7 method. See *La Littérature potentielle*, 143-54, and *Atlas de littérature potentielle*, 166-70. (WM)
3. Among the eleven texts offered in "Exercices d'homosyntaxisme" (*La Littérature potentielle*, 176-80), none is attributed to Latis. (WM)

FOR A POTENTIAL ANALYSIS OF COMBINATORY LITERATURE

1. *Dissertatio de Arte Combinatoria*, J.-E. Erdmann (1666). It is surprising to note that this very rare work, written in Latin, has never to our knowledge been translated. We owe certain of the references we used in the inventory of combinatorial literature to Y. Belaval. Let us also cite another famous mathematician, Leonhard Euler, who suggested principles for a Combinatory Art in his *Lettres à une princesse d'Allemagne sur divers sujets de physique et de philosophie*, Steidel (1770-74), 27.

2. One could mathematize the concept of configuration in defining it as an *application of a set of objects within an abstract finite set provided with a known structure*; for example, a permutation of n objects is a "bijective application of the set of objects within the set ordered 1, 2, . . . , n ." Nevertheless, we are interested only in those applications that satisfy certain constraints, and the nature of these constraints is too varied to allow us to use this definition as the basis for a general theory.

3. "Honor, Art, Money, Property, Praise, Woman, and Child / One has, seeks, misses, hopes for, and disappears." G. P. Harsdörffer (1607-58), a founder of the "Pegnitz Shepherds," a Nuremberg society, wrote a *Poetischer Trichter (Poetic Funnel)* (1647-53) with which one could "pour" the art of poetry into anybody in six hours. See J. G. Robertson, *Outlines of the History of German Literature* (Edinburgh: Blackwood, 1950), 83. (WM)

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4. Marc Saporta's *Composition No. 1* (Paris: Seuil, 1962) was published in 1962, not 1965. (WM)
5. The poem Berge has transformed is Ronsard's "Quand vous serez bien vieille":

Quand vous serez bien vieille, au soir, à la chandelle,
Assise auprès du feu, devinant et filant,
Direz, chantant mes vers, en vous esmerveillant:
Ronsard me celebroit du temps que j'estois belle.

Lors vous n'aurez servante oyant telle nouvelle,
Desja sous le labeur à demy sommeillant,
Qui, au bruit de Ronsard, ne s'aille réveillant,
Benissant vostre nom de louange immortelle.

Je seray sous la terre, et, fantosme sans os,
Par les ombres myrteux je prendray mon repos;
Vous serez au foyier une vieille accroupie,

Regrettant mon amour et vostre fier desdain.
Vivez, si m'en croyez, n'attendez à demain;
Cueillez dès aujourd'hui les roses de la vie.

Humbert Wolfe, in Pierre de Ronsard, *Sonnets for Helen* (London: George Allen and Unwin, 1934), translates the poem as follows:

When you are old, at evening candle-lit
beside the fire bending to your wool,
read out my verse and murmur, "Ronsard writ
this praise for me when I was beautiful."

And not a maid but, at the sound of it,
though nodding at the stitch on broidered stool,
will start awake, and bless love's benefit
whose long fidelities bring Time to school.

I shall be thin and ghost beneath the earth
by myrtle shade in quiet after pain,
but you, a crone, will crouch beside the hearth

Mourning my love and all your proud disdain.
And since what comes tomorrow who can say?
Live, pluck the roses of the world to-day. (WM)

6. See the study Jean Ferry devoted to him in the journal *Bizarre* 34-35 (1964).
7. Work on the literary applications of the Latin bi-square was pursued by Georges Perec; in 1978 it resulted in his *La Vie mode d'emploi*. (WM)

MATHEWS'S ALGORITHM

1. S + 7: see *La Littérature potentielle*, 143-54 and *Atlas de littérature potentielle*, 166-70. Semo-Definitional Literature: "Littérature Sémo-Définitionnelle"

or "L.S.D.," a process elaborated by Marcel Bénabou and Georges Perec; see *La Littérature potentielle*, 123-40. (WM)

2. It is entirely possible to apply the algorithm to syllables. If we omit this example, it is only because its demonstration is somewhat fastidious.

COMPUTER AND WRITER: THE CENTRE POMPIDOU EXPERIMENT

1. A.R.T.A.: "Atelier de Recherches et Techniques Avancées," or "Workshop of Advanced Studies and Techniques," a group working at the Centre Pompidou. For a time, the Oulipo used A.R.T.A. equipment in their work on computer-aided literature. Personal letter from Paul Fournel to the editor, 5 December 1983. (WM)

2. Gallimard.

3. In the same spirit and using a very similar technique, Michel Bottin programmed the 10⁶⁷ poems contained in the XLIst kiss of love of Quirinus Kuhlman.

4. This story is published in Oulipo, *La Littérature potentielle*, Gallimard's "Idées" collection, 277. [It also appears in the present volume (WM).]

5. A prototype of this text may be found in Oulipo, *La Littérature potentielle*, Gallimard's "Idées" collection, 281. [Appearing here as "The Theater Tree: A Combinatory Play." (WM)]

6. See Calvino's "Prose and Anticombinatorics." (WM)

7. See Roubaud's *La Princesse Hoppy ou le conte du Labrador*: Bibliothèque Oulipienne 2 (ch. 1); Bibliothèque Oulipienne 7 (ch. 2); *Change* 38 (1980), 11-29 (chs. 3, 4). (WM)

8. See Bénabou, *Un Aphorisme peut en cacher un autre*. (WM)

9. This paper was presented at the "Writer-Computer" meetings of June 1977.

THE THEATER TREE: A COMBINATORY PLAY

1. The "noble-pit" (*trappe à nobles*) is an allusion to Alfred Jarry's *Ubu roi*, III, ii. (WM)

Glossary

Included here are names of Oulipian and pre-Oulipian poetic structures, as well as figures of classical rhetoric (many of the latter occur in Marcel Bénabou's "Table of Elementary Linguistic and Literary Operations"). In the few cases in which Oulipian use of a term differs from general usage, this has been noted. The reader may find examples of many of the structures in *La Littérature potentielle* and *Atlas de littérature potentielle*, referred to below as I and II, respectively.

ALPHABETICAL DRAMA

A short theatrical form in which the lines spoken by the actors homophonically mimic the sound of a person reciting the alphabet. See I, 111-14.

ANAGLYPHIC TEXT

A three-dimensional verbal text. See I, 289.

ANAPHORA

Repetition of a word at the beginning of successive utterances: e.g., "I came, I saw, I conquered."

ANASTROPE

Unusual inversion of words or syntagms within an utterance: e.g., "Came the dawn."

ANTIRHYME

If one accepts the supposition that one may, for any given phoneme, postulate an "antiphoneme"—that is, a phoneme having opposite, complementary, or symmetrical characteristics—it would be possible to create antirhymes, or couplets ending in phonemes and their antiphonemes. Antirhyme is a special case of antonymic translation. See I, 291.

ANTONYMIC TRANSLATION

A process of textual production that involves the transformation of an utterance into its contrary, along a given axis of symmetry. The latter may be situated at any level: that of the individual word, of grammatical characteristics, or of the general signification of an utterance. See I, 204-05; II, 165.

APHAERESIS

The omitting of a syllable or a letter at the beginning of a word: e.g., "bo" for "hobo."

BEAU PRESENT

A form of acrostic encoding in which the letters of a given name appear, in order, in the text. According to the most doctrinaire, the letters of that name, once used, may not be used again in the text. Georges Perec practiced a special form

of the *beau présent*, using *only* the letters of a given name to construct the text. See II, 264, 291–92.

BELLE ABSENTE

A form of acrostic encoding in which the letters of a given name are the only letters not used in the text. In verse forms, one letter may be excluded in each verse; the name is thus progressively spelled out *in absentia*. See II, 213, 290–91, and Georges Perec, *La Clôture et autres poèmes*, 73–76.

BOOLEAN POEMS

A process of textual production devised by François Le Lionnais, a literary application of the work of the British mathematician George Boole (1815–64). See I, 262–68.

BRACHYLOGIA

An abridged expression: e.g., “And he to England shall along with you” (*Hamlet*, III, iii).

CENTO

A text composed of passages from other texts. See I, 172–75, 209–14.

CHRONOGRAM

A text in which certain letters, when placed together, form a date in Roman numerals. See II, 268–70.

COUPEUR A LA LIGNE

[Cutter on the line.] A variation of the **TIREUR A LA LIGNE** consisting of the progressive suppression of alternate sentences in a text. See II, 285.

CRASIS

Contraction of two letters or syllables into one.

DEPORTMANTEAU WORD

The division of a portmanteau word into its original constitutive elements.

DIAERESIS

In the Oulipian lexicon, the division of one syllable into two.

EDGES OF POEM

A process of textual production that uses the first and last verses, plus the first and last words of the intervening verses of a given poem. See I, 292–93.

EPANALEPSIS

Repetition at the end of an utterance of the word with which it began: e.g., “I would like that, would I.”

EPENTHESIS

Insertion of a letter, phoneme, or syllable into the middle of a word: e.g., “visiting” for “visiting.”

EURYPHALLIC VERSE

See SNOWBALL.

GEMINATION

In the Oulipian lexicon, the doubling of the initial syllable of an utterance.

HAIKUIZATION

A process that retains the rhyming parts of a poem to form a new poem. See Queneau’s “Potential Literature,” and I, 185–203.

HAPLOGRAPHY

An error through which a copyist deletes a segment of a text, due to the identity of the initial and final elements of the segment.

HENDIADYS

A figure of speech using two nouns and the conjunction “and,” rather than a noun and an adjective, to express a given idea.

HETEROGRAM

A text in which no letter is repeated. A “perfect” heterogram is also a “perfect” pangram: a text of 26 letters using all the letters of the alphabet. Georges Perec practiced a form called “heterogrammatic poetry” in which each verse of a given text is an anagram of every other verse within that text. See II, 231–36, 337, and Perec, *Alphabets*, *Ulcerations*, and *La Clôture et autres poèmes*.

HOLOPOEMS

Following the principles of holography, holopoems are represented as images in space. As the reader moves under (or over, or around) them, new words or verses become apparent. See I, 290.

HOLORHYME

A form of homophonic verse. See I, 237–38. See also HOMOMORPHISM.

HOMOEUTELEUTON

The repetition of a phoneme at the end of successive utterances: e.g., rhymed verses.

HOMOMORPHISM

A process by which new texts are generated, which imitate the structure of a master text. The different types of homomorphisms are defined by the structure imitated: homosyntaxism, homovocalism, homophony, etc. See I, 115, 176–80; II, 159–164.

JAVANESE STUTTERING

A form of stuttering wherein syllables, rather than phonemes, are repeated. See Jean Lescure’s “Poème pour bégue,” I, 116.

LARDING

A form of **TIREUR A LA LIGNE** elaborated by Paul Fournel. In his example, a Queneau text is successively “larded” with 3, 1, 4, and 1 new sentences (this series, of course, corresponds to the first four figures of the number π). See II, 283.

Glossary

LA RIEN QUE LA TOUTE LA

[The nothing but everything the.] A text without nouns, verbs, or adjectives, a structure proposed by François Le Lionnais. See I, 228–29.

LIPogram

A text in which a given letter (or letters) of the alphabet does not appear. See Georges Perec, "History of the Lipogram," *La Disparition*, and *Les Revenentes*. See also I, 77–100; II, 211–17. Liponyms, lipophonemes, and liposyllables are texts in which (respectively) a given word, phoneme, or syllable does not appear.

L.S.D.

"Littérature Sémo-Définitionnelle": Semo-Definitional Literature, a procedure elaborated by Marcel Bénabou and Georges Perec. Various effects are obtained through the substitution of the definitions of given words within a text for the words themselves. See I, 123–40.

METATHESIS

The transposition of letters or phonemes in a word: e.g., "modren" for "modern."

PALINDROME

A written locution that reads the same backward or forward. Palindromes may be "positive" or "negative": that is, composed, respectively, of an even or odd number of integers. See I, 101–06; II, 218–26. Phonetic palindromes, syllabic palindromes, and word palindromes are texts in which the reflected integers are, respectively, phonemes, syllables, and words, rather than letters. See II, 220–21.

PANGRAM

A text containing all the letters of the alphabet. Obviously, the "value" of a pangram increases in inverse proportion to its length. A "perfect" pangram is a text of 26 letters including all the letters of the alphabet. See II, 231–32.

PARAGOGUE

The addition of a letter or a syllable to the end of a word. This addition may be either functional (e.g., "drowned") or unnecessary (e.g., "drownded").

PARAMGRAM

A printer's error consisting of the substitution of one letter for another. As Marcel Bénabou uses the word in his "Table of Elementary Linguistic and Literary Operations," it bears only a very distant relation to the Saussurian notion of "paragraph."

PERVERB

A perverb juxtaposes the first part of one proverb to the second part of another. See II, 293–94, 344–45.

POEMS FOR MOEBIUS STRIP

A process elaborated by Luc Etienne, involving the disposition of a text on a Moebius strip. See I, 269–75.

Glossary

PORTMANTEAU WORD

A word that formally and semantically conflates two other words: e.g., "smog," from "smoke" and "fog."

PROSTHESIS

The addition of a letter or a syllable to the beginning of a word: e.g., "irregardless" for "regardless."

RHOPALIC VERSE

See SNOWBALL.

S + 7

A method of textual transformation elaborated by Jean Lescure in which each substantive in a given text is replaced by the seventh substantive following it in the dictionary. See I, 143–54; II, 166–70.

SNOWBALL

A form in which each segment of a text is one letter longer than the segment preceding it. Also called euryphallic verse and rhopalic verse. A number of variations are conceivable, such as the "melting snowball" (see Harry Mathews's "Liminal Poem"), in which, after its expansion, the poem contracts. See I, 107–10; II, 194–210.

SPOONERISM

A generally unintentional transposition of sounds in two or more words: e.g., "tee many martoonis." Named after the Reverend W. A. Spooner (1844–1930) of New College, Oxford, renowned for this sort of verbal lapsus. In French literature, the conscious use of spoonerisms, or *contrepèterie*, is thought to have originated with Rabelais. Luc Etienne's *L'Art du contrepét* serves as a spoonerism primer.

SQUARE POEM

A form proposed by Jean Lescure that exploits all possible permutations of a given set of four words. See his *Drailles*, 277–84, and I, 155–65.

SYNCOPE

The dropping of letters or syllables in the middle of a word or expression: e.g., "Halloween" for "all hallow even."

TAUTOGRAM

A text whose words all begin with the same letter. See I, 117.

TIREUR A LA LIGNE

[Puller on the line.] A form elaborated by Jacques Duchateau. Consists of taking two sentences in a given text and interpolating a new sentence, then two new sentences in the interstices thus created, and so forth. See Duchateau, *Les Sept Coups du tireur à la ligne en apocalypse lent, occupé à lire "Monnaie de singe"* de William Faulkner, and II, 271–85. See also COUPEUR A LA LIGNE and LARDING.

Glossary**TMESIS**

Insertion of one or more words between the parts of a compound word: e.g., "what person soever" for "whatsoever person."

UNTRACEABLE LOCUTIONS

A form elaborated by Marcel Bénabou. See his *Locutions introuvables*. See also PERVERB.

ZEUGMA

A figure in which a single modifier applies in different ways to two or more words: e.g., "The room was not light, but his fingers were."