DENNIS DUNCAN

Calvino, Llull, Lucretius: Two Models of Literary Combinatorics

GIVEN THE INTERNATIONAL SUCCESS of *Invisible Cities* and *If on a Winter's Night a Traveler*, it is perhaps surprising to learn that the output of Italo Calvino's late period—after his move to Paris in the mid-1960s—is considered in his native Italy to be his least satisfying work. Nevertheless, Anna Botta cites a number of Italian critics who share Franco Fortini's opinion that "all the works he wrote à la Queneau and à la Perec are deadly, destructive. He was poisoned by the French production of that Parisian period" (qtd. and trans. in Botta 88). Fortini is here referring to the Oulipo, the Parisian literary coterie dedicated to the investigation of literary constraints, whose members have included Raymond Queneau and Georges Perec, and who welcomed Calvino into their ranks in 1973.[1] His accusation seems to be leveled at the group as a whole: it doesn't matter whether we take Queneau, one of the group's founders in 1960, or Perec, who joined in 1967; their influence was apparently equally poisonous and so equally responsible for the "deadly, destructive" turn in Calvino's work.

Yet the distinction between "à la Queneau" and "à la Perec" is an interesting one. Jacques Roubaud, another of the group's members, has argued that a second era of the Oulipo—the "Perecquian Oulipo"—began in 1969 with the publication of *La Disparition*, Perec's novel without the letter *e* (Roubaud, "Perecquian OULIPO" 100). He also reveals that the initial energy and enthusiasm that followed the group's founding declined after a few years, resulting in the "Crisis of 66," which could be noted "specifically in the waning of the taking of *Minutes* at the meetings" (108). Roubaud hypothesizes that this "crisis" was the reason for the widening of the group's membership, which led to a second wave of Oulipians, beginning with himself in 1966 and including Perec, Harry Mathews, and Calvino, among others, over the next seven years. In what follows, I argue that during this same period a shift occurs in Calvino's conception of creativity and its relation to combinatorics, which he expresses in two rather different accounts of machine-produced literature. Over a period of about six years—roughly from the time of

[1] Calvino was something of a fellow traveler for some time before his actual election to the Oulipo, corresponding with Queneau during his translation of *Les Fleurs bleues* (see Federici) and, as I shall show, writing admiringly about the group in a 1967 lecture.

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his translation of Queneau's *Les Fleurs bleues* in 1967 to his election to the Oulipo—Calvino's theoretical writing demonstrates a modulation from rigid structuralism to a looser approach based on the exception to the rule, from the death of the author to his reincarnation, from a position akin to that of the Oulipo's founders to that of its second wave, from "à la Queneau" to "à la Perec."

However, in order to illustrate as thoroughly as possible the contrasting models underpinning Calvino's shifting conception of creativity, I propose to examine the work, not of Queneau and Perec, but of two writers who lived many centuries before "that Parisian period" and who wrote extensively on the subject of combinatorics—the ways in which discrete objects can be combined with each other.[2] In the "Lightness" essay of *Six Memos for the Next Millennium*, Calvino draws a parallel between the Epicurean philosopher Lucretius and the medieval theologian Ramón Llull, stating that "for Lucretius, letters were atoms in continual motion, creating the most diverse words and sounds by means of their permutations. This notion was taken up by a long tradition of thinkers for whom the world's secrets were contained in the combinatoria of the signs used in writing: one thinks of the *Ars Magna* of Raymond Lully" (26).[3] But, whereas Calvino emphasizes the similarities between Lucretius and Llull, I wish to treat them as representatives of opposing approaches to constraint and creativity. Llull characterizes the reader-oriented, highly structuralist tendencies of the Oulipo's early period, while Lucretius represents for Calvino the author's capacity to write himself into his work.

I. Ramón Llull

Ramón Llull (c.1232–1315), whom Roubaud describes as "one of the fathers of the 'Oulipian' conception of literature" ("Combinatorial Art" 37), was born in the city of Palma on the Mediterranean island of Mallorca. After experiencing visions, he renounced the troubadour ways of his early years and dedicated himself to the conversion, by reason, of other faiths to Christianity. He taught among the scholastics in Paris and undertook a number of missionary expeditions to North Africa, during the last of which he is said to have been stoned by an angry crowd, an event that may have hastened his death the following year (although this detail is contested, for example, in Bonner, ed., *Selected Works* 52n). Of his vast output (he wrote in Catalan as well as Latin and Arabic), it is the recurrent use of formal mechanisms—complex systems of combinatorics—for which he is most remembered, mechanisms that some critics believe were derived from the Jewish kabbalists of his native Mallorca (Yates 188; Eco 60).[4]

Llull's combinatorics is characterized by a series of diagrams and tables, with concentric circles divided into cells as the dominant device. One figure even features a rotating wheel similar to the moving circles of a code wheel for transposing

[2] For example, given a pair of empty cinema seats, there are two ways that a couple might arrange themselves: AB, BA. For three seats and three viewers, the number of arrangements rises to six: ABC, ACB, BAC, BCA, CAB, CBA.

[3] Because Anglicizations of Llull's Catalan name vary, where I have quoted other authors, it appears as Lull (Eco), Lully (Calvino as translated by Creagh; Calvino's original Italian has "Llull"), and Lullius (Rabelais).

[4] Both writers also suggest an Islamic influence on Llull's thought: Yates points to Sufism (177), and Eco notes that "Majorca during this period was a crossroads, an island where Christian, Jewish and Arab cultures all met" (53).

letters in a simple cipher.[5] The use of these figures is rather complicated—so much so that Llull simplified his own theory during his lifetime in order make it more accessible—and a detailed explanation would be beyond the scope of this article.[6] Jorge Luis Borges's description of the first circular figure should suffice for our purposes:

> The letter A, at the center, signifies the Lord. Along the circumference, the letter B stands for goodness, C for greatness, D for eternity, E for power, F for wisdom, G for volition, H for virtue, I for truth, and K for glory. The nine letters are equidistant from the center, and each is joined to all the others by chords or diagonal lines. The first of these features means that all of these attributes are inherent; the second, that they are systematically interrelated in such a way as to affirm, with impeccable orthodoxy, that glory is eternal or that eternity is glorious; that power is true, glorious, good, great, eternal, eternally powerful, powerfully wise, wisely free, freely virtuous, virtuously truthful, etc., etc. ("Ramón Llull's Thinking Machine" 155–56)

The diagram, in other words, is intended to elucidate the nature of God by taking His nine irrefutable "Dignities" and showing that each may be read as a quality of another: His greatness is eternal, and so on. The idea is that "by exhausting all possible combinations of these categories we are able to explore all the knowledge that can be understood by our finite minds" (Gardner 9).

Similar figures expand the grammar of the system to include, among other things, lists of the virtues, vices, and question words (*Whether* and *In what way*, for example). However, as Eco points out, the information generated by the wheels must not contradict the prevailing theological orthodoxy: "See, for instance, the question 'Whether the world is eternal' ('Utrum mundus sit aeternus'). Llull already knew the answer: negative, because anyone who thought the world eternal would fall into Averroist error" (Eco 63). Any generated content that conflicts with Llull's pre-existing theology is simply discarded. Thus, rather than examine what is meant by, say, *God is greedy*, he suppresses this as a nonsense or bad output. Although Llull's combinatorics is an attempt to fully describe a field—to know it entirely—knowledge that is *external* to the combinatorial system is required to authorize its output. In short, there is an appeal to a second-level filtering based on the user's theological knowledge.

We might well also feel that Llull's *Ars Magna* itself has fallen into the definitional fallacy of assuming that semantic items may be fully analyzed into their constituent categories in the same way that an integer may be expressed by its factors. As Frances Yates puts it, in its rigid enumeration of the essential Dignities of God, the *Art* "claims to know first causes" (175). And there is of course the oddity that this type of constituent category must always contain *nine* elements: God is fully analyzed by His nine Dignities; there are nine virtues and vices (rather than the usual seven); and in the category of Questions, when Llull can think of ten terms but doesn't want to leave one out, *Quomodo* (In what way) and *Cum quo* (With whom) are forced to share the same cell in the table even though they are clearly not synonymous. Llull's method relies on the assumption that "in every branch

[5] For Kittler, the chief influence behind Leon Battista Alberti's invention of the cipher disc, as well as his development of letter-frequency analysis for code-breaking, is Gutenberg's moveable type (39). However, in the case of the cipher disc, Llull's influence can surely be discerned as well.

[6] Bonner (*Art and Logic*) and Eco (53–72) both give good descriptions of the method. The former, at book length, treats the earlier model and its simplified successor separately, while Eco, for brevity, conflates the two, as have I. Paolo Rossi meanwhile quotes a didactic poem by Llull in which he "insists on the miraculous brevity of his combinatorial art and how quick and easy it is to learn and retain" (45).

of knowledge . . . there are a small number of simple basic principles or categories that must be assumed without question" (Gardner 9), and, like John Wilkins a few centuries later, he exhibits a misguided confidence that the categories he chooses will fully exhaust the object under analysis. Indeed, according to Llull, the *Ars Magna* could be used to illuminate the nature, not just of God, but also of the angels, the stars, man, animals, plants, and so on: "Hardly a science or subject matter escapes his analysis by [this] method" (Gardner 14). Some of the examples Llull uses to demonstrate the *Art*'s practical use have an almost algebraic appearance due to their referencing of the tables:

Question: Whether the soul, which is good, is subject to falsehood, which is evil?

Solution: With F^S remembering the fourth and fifth compartments, G^S understands that, just as dryness is the passive subject upon which is carried out the transformation of wine into vinegar as a result of the transformation of heat into cold, so E I N are the subjects in which is carried out the transformation of Y into Z contrary to the red $triangle^T$, there being a difference between S and B C D, as well as between B C D and E I N, to which B C D are subject, beneath which B C D lies S. (qtd. and trans. in Bonner, *Art and Logic* 87)

Llull goes on to give even more obscure examples in which he merely lists the tabular combinations that should resolve the question at hand with no further explanation:

Question: Whether, for a similar crime, a townsman should be more punished than a peasant?

Solution: special nutritive; E I; N R; mixture digestion; being privation; majority minority. (qtd. and trans. in Bonner, *Art and Logic* 91)

Although I have not described some of the other figures used in these explanations, this last example should illustrate clearly enough some of the main problems with the system. First, there is not a clear logic that allows its user to ascertain which combination should be used to answer any given question; that is, the system is not dynamic. The question itself does not contain anything that will map it onto Llull's tables. Instead, Llull simply analyzes each possible combination and decides *a posteriori* that, for example, this particular arrangement would solve the question of whether a townsman is more culpable than a peasant.

Second, and perhaps more damningly, the type of coherent meaning that Llull says can be derived from his system (for example a clear answer to the question regarding the peasant and the townsman) does not in fact proceed logically from the tables without an additional interpretive step. The figures function more like tarots than any logical system, acting as a creative point of departure rather than offering a single, static meaning. When Francis Bacon declares that Llull's method is "much like a Frippers or Brokers Shoppe; that hath ends of everie thing, but nothing of worth" (127; see also Rabelais 48), it is not hard to see what he means: the system proposes exhaustiveness, but tells us nothing, since every combination needs to be interpreted.

This has led some commentators to defend the *Ars Magna*, not as a machine capable of logical demonstration, but as a source of creative inspiration. As Yates notes, the user of the first figure (*Greatness is eternal*, *Goodness is great*, etc.) is intended to "meditate on the complex relations of the Names with one another as they are in the Godhead, before extension into the creation, and as aspects of the Trinity" (181). Thus, a user who chooses, say, the combination KH must interpret what it means that His glory is virtuous. Borges proposes replacing the religious Dignities of the first figure with a kind of creative prompting for struggling poets:

Let us select a problem at random: the elucidation of the "true" color of a tiger. I give each of Llull's letters the value of a color, I spin the disks and I decipher that the capricious tiger is blue, yellow, black, white, green, purple, orange, and grey, or yellowishly blue, blackly blue, whitely blue, greenly blue, purplishly blue, bluely blue, etc. . . . The poet who requires an adjective to modify "tiger" proceeds in a manner identical to the machine. He tries them out until he finds one that is sufficiently startling. "Black tiger" could be a tiger in the night; "red tiger," all tigers, for its connotation of blood. ("Ramón Llull's Thinking Machine" 157–59)[7]

Whether used for religious or poetic ends, Llull's *Art* demonstrates a theologically-based confidence that inspiration is the result of a rigidly observed calculus, and not of a Romantic individualism.

II. Calvino's Literature Machine

The parallel between Llullian and structuralist methodologies should be clear: just as Roman Jakobson's phonology tabulates distinctive features (for example, [+/- voice], [+/- nasal]) to describe the entire repertoire of available phonemes, so Llull believed that the entire universe could be distilled into his tables. In the Paris of the early 1960s, a structuralist narratology, based on Vladimir Propp's analysis of the folktale—or, rather, Levi-Strauss's extended review of Propp's *Morphology of the Folktale*—was gaining influence (see, for example, Barthes's 1966 article "Introduction à l'analyse structurale des récits"), and this approach to narrative makes a notable appearance in Calvino's 1967 lecture "Cybernetics and Ghosts."[8]

Composed after Calvino moved to Paris with his family, "Cybernetics and Ghosts" rehearses some of the themes involving combinatorics that are encoded in his later work. The main conceit of the essay concerns a literature machine, an automaton "capable of replacing the poet and the author" (12). Barthes's "Death of the Author," published the same year, resonates in Calvino's provocative suggestion that the structuralist analysis of narrative could make the author redundant—that a machine working by combinatorics might produce every conceivable text:

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[7] This passage from 1937 takes on a new poignancy when, late in life, the blind Borges explains why he chose the title *El oro de los tigres* (*The Gold of the Tigers*) for a 1972 collection of poems. In a 1976 interview, he recalls visiting a zoo and seeing a tiger as one of his earliest memories. He adds, "I feel drawn to tigers, those first things I saw in life. Later came years of myopia, years of blindness, but there was one color that survived. It was the color yellow. And that's why I entitled a book *The Gold of the Tigers*. Since my first vision was the gold of tigers, the color yellow is the color that stands out. It was the last color that my declining eyes could see as they became lost in a gray mist" (*Conversations* 169).

[8] It is likely that Calvino had a direct familiarity with Propp's *Morphology*, unmediated by Levi-Strauss. The *Morphology of the Folktale* was published in Russia in 1928, but languished untranslated for several decades, during which time its influence in the West was felt only indirectly through the émigré Jakobson's work in structuralist linguistics. It was eventually translated into English in 1958, but the French version did not appear until 1970. The situation in Italy, however, was somewhat different (see Meijer). First, Propp's *Historical Roots of Russian Fairy Tales* (1946) had been translated into Italian in 1949. Thus, when Calvino came to publish his collection of Italian folktales, the *Fiabe Italiani* in 1956 (several years before Levi-Strauss's review), he was already able to cite Propp in the Introduction (*Italian Folktales* xxvii). Second, an Italian translation of the *Morphology* was published by Einaudi—for whom Calvino worked as an editor—in 1966. This edition went some way to prolonging hostilities between Propp and Levi-Strauss by including Levi-Strauss's 1960 review, along with a rebuttal by Propp, and then a further postscript by Levi-Strauss (see Dundes). Finally, in his 1973 essay "La tradizione popolare nelle fiabe," Calvino refers to the *Morphology* as "an obligatory point of reference" ("Popular Tradition" 58), although he does note that it remained obscure until the Levi-Strauss review.

> 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? (12)

One might discern the influence of Lacan in the analogy of the psychological and the linguistic, the positing of a "grammar [or] syntax" of "our psychological life," and the passage's movement is certainly as much Lacanian as Llullian in its reminder that nothing is conceivable outside "the permutations authorized by language" (Lacan, "Instance of the Letter" 140). Like Llull's wheel, Lacan's unconscious, or Jean Lescure's early Oulipian suite of textual permutations, Calvino's literature machine has neither space nor need for an author-subject.[9] As we will see, however, the same essay also exhibits a rather more traditional—and unLacanian—approach towards the unconscious, treating it not as the transindividual "discourse of the Other" but as the zone of the subjective unsayable.

Calvino's model of narrative analysis is by definition Proppian in that it subjects literature to a compositional analysis. However, its totalizing ambition is distinctly Llullian. Whereas Propp takes into account only plot functions and character attributes and has nothing to say about style—it is all about the tale and not the telling—Calvino's imagined machine has no such limitations: it is an engine capable of describing and producing the entire universe of potential literature. It is small wonder then that, while not yet a member of the Oulipo, Calvino became aware of the group at this stage of his career. This was, after all, the same year in which Einaudi published *I fiori blu*, Calvino's Italian translation of Queneau's *Les Fleurs bleues*. However, in "Cybernetics and Ghosts" Calvino, describing the Oulipo as an "almost clandestine group," refers not to this novel but to another work by Queneau, *Cent mille milliards de poems*, calling it "not so much a book as the rudimentary model of a machine for making sonnets" (12).[10]

If Queneau's "machine" consists of dozens of prefabricated lines of poetry, Calvino's starting point would be a complete categoric analysis of narrative. Just as Jakobson's phonological distinctive features (themselves influenced by Propp's *Morphology*) describe the full range of phonemes, these elements would allow every possible text to be derived. The structuralist/Llullian method implies that once a field has been fully codified, its universe is simply the complete set of possible combinations. In such a manner, given a thorough enough analysis of narrative, Calvino's literature machine could explore every possibility. The output of the literature machine would constitute a third category of automatic writing (automatic simply because it is generated by an automaton) alongside the Surrealists' experiments in automatism and the source-and-substitution methods of the early Oulipo.

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[9] Mathews and Brotchie summarize the Lescurean Permutations as concerning "single parts of speech, such as nouns, as they appear in pre-existing works. [Lescure] suggests subjecting them to four basic manipulations: [e.g.] *Plain permutations*: the 1st noun changes place with the 2nd, the 3rd with the 4th, etc." (168).

[10] Queneau's text "consists of a sequence of 10 14–line sonnets. . . . Its composition was perhaps inspired by the children's game *Heads, bodies, legs*: just as in that game body parts from each section can be interchanged, so any line in any one of these sonnets can replace the corresponding line in any other sonnet. (The rhyme scheme of the sonnets is uniform; grammatical correctness is assured no matter what sequence of lines occurs.)" (Mathews and Brotchie 14).

Aside from the idea that narrative might be entirely anatomized as the product of a certain number of discrete elements—the Llullian fallacy of exhaustiveness—there remains something rather inane about this writing machine. It is a little like the scene from *Gulliver's Travels* in the Grand Academy of Lagado where there is a great wooden frame, "twenty foot square," with iron handles and "bits of wood . . . linked together by slender wires. These bits of wood were covered on every square with paper pasted on them; and, on these papers were written all the words of their language in their several moods, tenses, and declensions, but without any order" (Swift 196). Turning the handles will generate every possible sentence in the language, although this vast task proceeds slowly: "Six hours a-day the young students were employed in this labour; and the professor shewed me several volumes in large folio already collected, of broken sentences, which he intended to piece together; and out of those rich materials to give the world a compleat body of all arts and sciences." By indiscriminately listing everything that is possible to say, the machine will allow "the most ignorant person at a reasonable charge, and with a little bodily labour, [to] write books in philosophy, poetry, politicks, law, mathematicks and theology, without the least assistance from genius or study."[11] Swift's target is of course Wilkins's attempt to create a universal language, but it is also, indirectly, Llull's method of taking readings from his tables only to retrospectively invent the questions to which these could function as the answers. Does not Calvino's literary machine suffer from the same *a posteriori* problem?

Just as the Llullian wheels need an interpreter to create a narrative from the information they generate, so (in a distinctly Barthesian maneuver) Calvino's machine-authored texts become charged with emotional value by means of the *reading* process, and to make this case he draws on a model of the unconscious that is quite distinct from Lacan's inflections of structuralist linguistics: "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" ("Cybernetics" 19). While this passage contains a great deal of linguistic imagery—*unsayable*, *the land of language*, *the unconscious speaks*, *verbal slips*, *borrowed words*, *linguistic contraband*, *literature redeems*, *the language of the waking world*—it is certainly not a description of the Lacanian unconscious-as-letter. The unconscious Calvino describes is explicitly *non*-linguistic. It is unsayable not because it must not be said, but because it *cannot* be said; when it speaks it must use borrowed words. This is the unconscious-as-meaning, the "hidden experience" singularly attached to its textual translation. The other major metaphor in the passage is geography—*the ocean of the unsayable*, *the land of language*, *territories*, *the waking world*—and we are encouraged to view the unconscious as the zone or region where meaning is contained. And repression and taboo, in the form of expulsion and ancient prohibitions, form the mechanism by which this material is consigned to the unconscious.

[11] Compare Leibniz's comment about his own *characteristica*: "les petits esprits, qui auroient de l'application et de la bonne volonté, pourroient non pas accompagner, mais suivre au moins les plus grands. Car on pourroit toujours dire: comptons, et juger comme il faut par cette voye autant que les *data* et la raison nous en peuvent fournir les moyens" (Couturat 118n; lesser minds, those with the will and the application, might, not accompany, but at least follow greater ones. For one could still say, "Let us calculate," and judge correctly, as far as reason and the data are able to furnish us with the means).

In the case of Calvino's literature machine, meaning is supplied not by the author-subject, but by the reader. The mystery of literature, Calvino suggests, lies not in its production, but in the shock that occurs when its elements unexpectedly chime with the reader's unconscious. He writes that "Literature is a combinatorial game that pursues the possibilities implicit in its own material, 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" ("Cybernetics" 22). Although the passage mentions an *author*, it is the *reader's* unconscious that endows the text with meaning: "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." There are strong echoes here of Yates's and Borges's defense of the Llullian Art as a poetic/meditative device that cannot be programmed to provide clear meanings but rather catalyzes the interpretive faculties of its user.

This leaves Calvino, in 1967, occupying a position somewhere between the arch-automatists of the early Oulipo and the second wave to come. A disdain for notions of the author-subject is clearly discernible in the early output of the Oulipo, both in their descriptions of procedural methods for creating texts—the Lescurean Permutations, for example, or *S*+7[12]—and in pronouncements such as this one from Lescure: "Je veux dire que ça n'est pas intéressant de savoir pourquoi et comment je veux parler. Romantisme tout ça, psychologie, bricolage" (151; I mean it isn't interesting to know why and how I want to speak. That's just Romanticism, psychology, *bricolage*). "Cybernetics and Ghosts," which envisages a future in which the author has been expunged entirely, sits easily alongside these experiments. In fact it goes further than they do, since Calvino's literature machine does not even need to be fed a source text, whereas the Oulipian procedures are ultimately transformations: whether it be Hamlet's "To be or not to be" or Wordsworth's "Daffodils," a starting text must still be chosen. By drawing on combinatorics, Calvino daringly suggests that proceduralism might go beyond the narrow confines of *S*+7 and ultimately surpass any form of literary Turing test.

Yet Calvino at the same time is careful to preserve the human—the "empirical and historical man"—at the center of the literary experience, and he draws on a psychoanalytic model of the unconscious as individual, subjective zone of meaning that is deliberately opposed to, rather than aligned with, the systematization of the textual mode of production. In the following section I will examine how, six years after "Cybernetics and Ghosts," Calvino would put a simplified version of his literature machine into practice to create the short story "The Burning of the Abominable House." Describing the background to this story, however, he states that combinatorics is not sufficient in itself for the creation of a literary text and that there are additional processes involved in writing in which the author is, of necessity, present.

[12] In Queneau's description, the *S*+7 method consists of "taking a text and replacing each substantive with the seventh following it in a given dictionary. The result obviously depends on the dictionary one chooses. Naturally, the number seven is arbitrary" (61).

III. The Literature Machine in Practice

Umberto Eco's description of Llull's method could hardly be more apt for Calvino's combinatory machine: "A procedure . . . for inventing a variety of possible 'scenarios.' In semiotic terms, we are in front of an expression-system . . . so that the arrangement of the expression-items can automatically reveal possible content-systems" (55–56). This is also a useful description of many Oulipian constraints, which, by performing functions at the level of the signifier, can produce interesting conjunctions at the level of the signified, generating narratives that will be suggestive in original ways. In "Rule and Constraint" Marcel Bénabou provides a diagrammatic schema of the Oulipian method—entitled *The Three Circles of Lipo* (47)—that is clearly based on Llull's *Art*. It consists of three concentric circles, each divided into sections. The inner circle lists linguistic elements (the group would call these syntactic elements) that may be subject to constraint or manipulation: letter, phoneme, syllable, and so on. The middle circle lists narrative elements (or semantic elements, in the group's terminology): for example, character, décor, and event. The outer circle contains operations such as displacement, substitution, and deduction. The circles rotate independently, so that any alignment of the three layers—syntactic object, semantic object, and operation—is possible. The syntactic and semantic are thus related by the constraints suggested by the wheel (for instance, *words* concerning *emotion* will be subject to a *substitution* operation). The diagram thus represents, in an explicitly Llullian form, the closest the Oulipo have come to realizing Calvino's proposed machine.

Calvino himself uses a far simpler system to demonstrate the use of combinatorics in storytelling. Unlike the vast narrative codification proposed in "Cybernetics and Ghosts," in "Prose and Anticombinatorics" he draws on some rather smaller sets of narrative elements and proposes the following template for creating detective stories:

> 4 characters: A, B, C, D.
> 12 transitive, nonreflexive actions (see list below).
> All the possibilities are open: one of the 4 characters may (for example) rape the 3 others or be raped by the 3 others.
> One then begins to eliminate the impossible sequences. In order to do this, the 12 actions are divided into 4 classes, to wit:
>
> appropriation of will
> to incite
> to blackmail
> to drug
> appropriation of a secret
> to spy upon
> to brutally extort a confession from
> to abuse the confidence of
> sexual appropriation
> to seduce
> to buy sexual favours from
> to rape
> murder
> to strangle
> to stab in the back
> to induce to commit suicide. (145–46)

With a few extra rules—for example, each character will figure three times as perpetrator and three as victim—and substituting the names Arno, Baby, Clem, and Dani for the letters A, B, C, and D, Calvino can now mechanically derive a set of plots such as the following:

> 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. (150–51)

It is clear, he admits, that the algorithm requires further refinement, since in its current version it allows Clem to buy sexual favors from Dani even after the latter has had her throat cut. But just as Llull rejects combinations that contradict his pre-existing theology, so Calvino chooses not to resort to awkward devices (Dani survived the attack; it wasn't really her but a case of mistaken identity; she comes back as a ghost; the narrative is non-linear) when a combination places too great an interpretive burden on the author. (Borges, in "The Garden of Forking Paths," is far more open to the play of impossible permutations: "In yet another, I say these very same words, but am an error, a phantom" [*Fictions* 91].) Nevertheless, the potential for generating a vast number of narratives from the combination of a small number of elements should be obvious.

In fact, Calvino uses precisely this schema in "The Burning of the Abominable House," which appeared as "L'incendio della casa abominevole" in the February/March 1973 edition of Italian *Playboy*. The story, which is narrated by a computer programmer named Waldemar, concerns an arson attack on a boarding house that has left four people dead. The only clue to the nature of the incident is a copybook, largely burnt but for a label on its front—"An Account of the Abominable Deeds Committed in this House"—and an index on the back cover with "twelve entries in alphabetical order: Blackmail, Drugging, Incitement to Suicide, Knifing, Prostitution, Threatening with a gun, Tying and Gagging, Rape, Seduction, Slander, Snooping, Strangling" ("Abominable House" 156). In a passage that recalls the mathematical precision of Queneau's introduction to the *Cent mille milliards de poems*, in which he calculates exactly how many millions of years it would take to read every one of the book's possible sonnets, Waldemar, who has been hired by Skiller, the insurance agent, to investigate the incident programmatically, outlines the problem of using combinatorics to investigate the crime:

> Even if we accept that each of the twelve deeds was committed by just one person and inflicted upon just one other person, reconstruction would still be a tall order: given that there are four characters to be considered, then taken two by two we have twelve possible relationships for each of the twelve kinds of relationship listed. The number of possible combinations is thus twelve to the twelfth, meaning that we shall have to choose from a total of eight thousand eight hundred and seventy-four billion, two hundred and ninety-six million, six hundred and seventy-two thousand, two hundred and fifty-six potential solutions. It is hardly surprising our overworked police force has chosen not to pursue its enquiries. (157)

Much of the story then consists of a description of the filtering system that Waldemar applies to his model, a system that recalls Llull's exclusion of certain combinatorial possibilities based on information external to his *Art* (for instance, the idea that the world might be eternal). Unlike Arno, Baby, Clem, and Dani in "Prose and Anticombinatorics," however, the four suspects in this narrative are given both names and backstories: Widow Roessler, the boarding house landlady; Ogiva, Roessler's fashion model daughter; Inigo, a dissolute young lord; Belindo Kid, an Uzbek wrestler. These details in turn provide the basis for excluding certain combinatorial possibilities: "[strangulation] would be an action of which [Belindo] could only be the subject and not the object: I'd like to see the other three trying to strangle the middleweight wrestler; their puny fingers wouldn't even go round his tree-trunk neck!" ("Abominable House" 160). As Waldemar puts it, "F/ollowing this method allows me to rewrite my flow-chart: to establish a system of exclusions that will enable the computer to discard billions of incongruous combinations" (161).

"The Burning of the Abominable House" thus situates itself halfway between a pure and exhaustive combinatorics and a set of external factors that suggest a more traditional model of authorial decision-making. Furthermore, because it is a text that describes its own construction under the guise of staging a *re*-construction, it is hard not to conclude that Waldemar's words are sometimes as true of Calvino as they are of his narrator: "Half I'm concentrating on constructing algebraic models where factors and functions are anonymous and interchangeable, thus dismissing the faces and gestures of those four phantoms from my thoughts; and half I am identifying with the characters, evoking the scenes in a mental film packed with fades and metamorphoses" (161). As a result, Calvino appears here to be moderating the strictness of the position he took up in "Cybernetics and Ghosts." The systematic production of the literature machine now constitutes only half of the creative process.

IV. Lucretius and the *Clinamen*

"Prose and Anticombinatorics" concludes with the following statement: "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" (152). This position is of course something of a retreat from the one assumed in "Cybernetics and Ghosts," since Calvino now speaks of writing with the *aid* of a computer, rather than as the product of a completely autonomous machine. Furthermore, although Calvino continues to assume that writing is always a combinatory search—this is the necessary slavery of the creative act and, as such, it can at least be delegated to a computer—the *clinamen* alone can make a true work of art.

The *clinamen* is a concept borrowed from the Epicurean philosopher Lucretius, who lived during the first century BCE. His long poem *De rerum natura* is partly concerned with conveying the Atomist philosophy that the universe comprises atoms and the void, both of which are infinite, and that atoms, of which all matter is composed and which give each object its character, belong to a

small number of categories. Punning on the Latin *elementa*, which signifies both letters and atoms, Lucretius frequently calls attention to the way the structure of the universe provides an apt analogy for the derivation of a vast lexicon of words from a limited alphabet:

> Moreover, it is important in my own verses with what and in what order the various elements are placed. For the same letters denote sky, sea, earth, rivers, sun, the same denote crops, trees, animals. If they are not all alike, yet by far the most part are so; but position marks the difference in what results. So also when we turn to real things: when the combinations of matter, when its motions, order, position, shapes are changed, the thing also must be changed. (Lucretius 2.1013–22)[13]

It is easy to see how this argument would appeal to Calvino. It is an extension of combinatorics, not just to literature, but to the entire material universe, and it even uses a literary analogy to make its point. And, indeed, Calvino praises *De rerum natura* as "the first great work of poetry in which knowledge of the world tends to dissolve the solidity of the world, leading to a perception of all that is infinitely minute, light, and mobile" (*Six Memos* 8), drawing special attention to the passages where the "atomizing of things extends . . . to the visible aspects of the world": "it is here that Lucretius is at his best as a poet: the little motes of dust swirling in a shaft of sunlight in a dark room (2.114–24); the minuscule shells, all similar but each one different, that waves gently cast up on the *bibula harena* (the 'imbibing sand') (2.374–76); or the spiderwebs that wrap themselves around us without our noticing them as we walk along (3.381–90)" (*Six Memos* 9). In the same passage, Calvino also alludes to the concept for which Lucretius is perhaps best known, and which constitutes the Dionysian element in Calvino's Oulipian combinatorics. "Even while laying down the rigorous mechanical laws that determine every event, [Lucretius] feels the need to allow atoms to make unpredictable deviations from the straight line, thereby ensuring freedom both to atoms and to human beings" (8). Calvino is here thinking of the concept of the *clinamen* (often translated as *swerve*), which Lucretius introduces in Book 2:

> while the first bodies are being carried downwards by their own weight in a straight line through the void, at times quite uncertain and uncertain intervals, they swerve [*depellere*] a little from their place, just so much as you might call a change of motion. For if they were not apt to incline [*declinare*], all would fall downwards like raindrops through the profound void, no collision would take place and no blow would be caused amongst the first-beginnings: thus nature would never have produced anything. (2.217–24)

Lucretius then suggests that "swerving" also underlies free will:

> if all motion is always one long chain, and new motion arises out of the old in order invariable, and if the first-beginnings do not make by swerving [*declinando*] a beginning of motion such as to break the decrees of fate, that cause may not follow cause from infinity, whence comes this free will in living creatures all over the earth, whence I say is this will wrested from the fates by which we proceed whither pleasure leads each, swerving [*declinamus*] also our motions not at fixed times and fixed places, but just where our mind has taken us? For undoubtedly it is our own will in each that begins these things, and from the will movements go rippling through the limbs. (2.251–62)

Finally, as he restates the latter argument, he introduces the term *clinamen*: "what keeps the mind itself from having necessity within it in all actions, and from being as it were mastered and forced to endure and to suffer, is the minute swerving [*clinamen*] of the first-beginnings at no fixed place and at no fixed time" (2.289–93).

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[13] The same image, in largely the same terms, also appears at 1.196–98, 1.823–29, 1.907–14 and 2.688–99.

The *clinamen* is wholly unpredictable, yet without it there is nothing. As Derrida puts it, the *clinamen* represents "a certain interfacing of necessity and chance" (6). For Calvino, of course, it represents the author's exercise of will in deviating from his self-imposed constraints, but it is important also to note the persistence of the theme of necessity: the *clinamen alone* can make of the text a true work of art: it is the sine qua non. Thus true art and subjectivity are indissociable.

Within the Oulipo, the *clinamen* is described by Jacques Roubaud as follows:

> It is obvious, to anyone who has tried it, that writing according to a fairly demanding Oulipian constraint can be exasperating; for beyond the difficulty (which can perfectly well be mastered) of following the strict requirements of the rule, one is filled again and again with disappointment at not being able to use such-and-such a word or image or syntactical construction that strikes one as appropriate but is forbidden. For such situations the Oulipo has therefore introduced the "concept" of the clinamen, whose Democritean origin sufficiently indicates its nature: that of a nudge given to the uniform, rectilinear, and fearfully monotonous motion of the original atoms so that by colliding they can start the world of writing going in all its variety. A clinamen is an intentional violation of constraint for aesthetic purposes: a proper clinamen therefore presupposes the existence of an additional solution that respects the constraint and that has been deliberately rejected—but not because the writer is incapable of finding it. ("Combinatorial Art" 43–44)

There is a proviso here that has been absent from Calvino's writing on the subject, but which is echoed by Mathews and Brotchie: "the clinamen can only be used if it isn't needed" (Mathews and Brotchie 126). They add that "[a] number of Oulipians, notably Italo Calvino, have felt that the clinamen plays a crucial role," and yet "clinamens do not abound."

Mathews and Brotchie go on to claim that "the clinamen was brought to the attention of Pataphysicians and Oulipians alike through the agency of Alfred Jarry, who rescued this obscure principle of classical philosophy and made of it a central tenet of his 'science of exceptions,' 'Pataphysics" (126). There are some questionable assertions in this sentence, not least that the *clinamen*, which makes an appearance in the work of Lacan, Bloom, Serres, Deleuze, and Derrida, among others, should need rescuing as an "obscure principle" (see Lacan, *Four Fundamental Concepts* 63; Bloom 19–45; Serres 135–57; Deleuze 266–79; Derrida 4–17). In fact, Jarry came by it through attending one of Henri Bergson's lectures (Berressem 53), and, before that, Marx wrote about it in his doctoral dissertation (Livergood 77–85). We should also treat with caution the suggestion that Calvino's understanding of the concept was mediated by Jarry, the Oulipo, or indeed any of the others who have adopted it, since he writes explicitly and admiringly of Lucretius, both as a poet and as a philosopher. It is of course possible that Calvino did learn of the *clinamen* from the Oulipo and subsequently traced the concept to its source, where he found much else to admire. However, we need not assume this to be the case, for, as Bloom points out, "the study of Poetic Influence is necessarily a branch of 'Pataphysics, and gladly confesses its indebtedness to ' . . . the Science, of Imaginary Solutions' " (42).

What we can be certain of is that the *clinamen* is absent from Calvino's combinatorics when he describes the writing machine in "Cybernetics and Ghosts" but has entered his thinking by the time of "Prose and Anticombinatorics." It represents a shift from the automatism and reader-oriented stance of the earlier essay and a redeclaration of the role of the author. The strength of the statement that the *clinamen* "alone can make of the text a true work of art" poses a challenge to the status of, for example, *S+7* texts, which, as Bellos points out (597), are often subject to a

discreet bending (or swerving) of the rules. The text must go beyond combinatorics, Calvino declares: it must bear the mark of the presence of an author.

In making this shift, Calvino aligns himself with other second wave members of the Oulipo for whom the authorial subject is not something to be elided—with Mathews, for example, who states that it was the constrained writing of Raymond Roussel that taught him that "writing could provide me with the means of so radically outwitting myself that I could bring my hidden experiences, my unadmitted self into view" (155). Nevertheless, some differences persist. The *clinamen*, by definition, is supplementary to the textual constraint, whereas for Mathews it is through the constraint *itself* that the author writes himself into a work. Furthermore, Calvino's comments on the *clinamen* leave two key questions unanswered: What does he mean by "a true work of art"? What is conferred by the authorial act that elevates the text? For the answer to both, I turn to another of Calvino's rather epigrammatic comments, this time from *The Castle of Crossed Destinies*: "In writing, what speaks is what is repressed" (102).

V. Calvino's Authorial Unconscious

This statement—"In writing, what speaks is what is repressed"—is just one of a number from the chapter "I Too Try to Tell My Tale" that use the language of psychoanalysis. The theme is introduced in veiled terms a few lines earlier when the narrator asks, "is not the raw material of writing all a rising to the surface of hairy claws, cur-like scratching, goat's goring, repressed violences that grope in the darkness?" (*Castle* 101). The densely packed images in this sentence present a spatial model of the psychoanalytic unconscious—a *surface* below which assorted ghouls are *repressed*—without mentioning psychoanalysis by name. However, if the "repressed violences" in Calvino's unnamed unconscious are familiar—*violence*, sexuality (*grope*), ugliness (those *hairy claws*), and allusions to both the satanic (the *goat*) and the gothic (say, Poe's Madeline Usher *scratching* her way out of the tomb), all situated in *darkness*—this is an ersatz, comic-book "horror," in which well-worn signifiers stand in for the real unnameable terrors we repress. Calvino's decision to represent the unconscious in cartoonish terms and his structuring of the sentence as a rhetorical question (*is it not . . . ?*) rather than a bald assertion seems at once unsure and coercive. The coerciveness is a function of the uncertainty: the tentative syntax plays on the reader's sympathy. It draws us into agreement with what is, in fact, a strong and uncompromising proposition: the raw material of writing is *all* [*tutto*] a rising to the surface of the repressed terrors of the unconscious.[14] *Writing* then becomes a term that Calvino uses in an exclusive, even slightly elitist, manner: it is that which addresses the unconscious; all other utterances are outside the present consideration. As a result, the assertion that "In writing, what speaks is what is repressed" becomes a tautology: if the repressed were not speaking, the text would not, in his terms, be considered *writing*. This is the "true work of art," then, and the *clinamen* carries the mark of the author when it draws on his own repressed material. In short, we encounter a very old—and

[14] In the original Italian, the sentence is as follows: "la materia prima dello scrivere non è tutto un risalire alla superficie di grinfie pelose, azzannamenti cagneschi, cornate caprine, violenze impedite che annaspano nel buio?" (*Il castello* 100–01).

very familiar—account of literature annexing the territories of taboo to the language of the waking world, except now, if the text doesn't deal in linguistic contraband, it isn't Literature.

Here is the passage in which the assertion that "what speaks is what is repressed" appears. It comes immediately after a retelling of Sade's twin stories *Justine* and *Juliette*: "All this is like a dream which the word bears within itself and which, passing through him who writes, is freed and frees him. In writing, what speaks is what is repressed. And then the white-bearded *Pope* could be the great shepherd of souls and interpreter of dreams Sigismund of Vindobona" (*Castle* 102). Until this point, images—the illustrations on two decks of tarot cards—have produced, or "borne within themselves," the tales in *The Castle of Crossed Destinies*: the two sections of the work were each composed by laying a deck of tarots in a grid and treating them as a set of pre-existing illustrations for the suite of tales Calvino had to write. In this passage, however, Calvino substitutes *words* for cards: each tale is a "dream which the *word* bears within itself." That is, we are invited to read the work and its method of production—using *images*—as a metaphor for the *word*-play of psychoanalytic free association. Words, he implies, are as polysemic as the archetypes depicted on a deck of tarot, and by analyzing them, by following through the stories they suggest to us at any particular moment, we are "writing," which by definition frees (and frees us of) the material bound up in our unconscious.[15] It is only through this oblique metaphor, the almost imperceptible substitution of word for image, that Calvino addresses how the writer can hope to access the dark materials of the unconscious. It is left largely to the reader to infer that the tales could not have been told without the constraint imposed by the tarot cards, or, rather, that without the constraint the tales would have been banal and thus undeserving of the designation of *writing* as Calvino intends it.

The *clinamen* therefore becomes the perfect analogy for Calvino's concept of writing, as it implies both constraint and deviation. In Lucretius's model of the universe, the *clinamen* has no value unless it occurs within a context of otherwise perfect order. It has no meaning in an anarchic universe or a non-constrained mode of literary production: the deviation must have a *system* from which to deviate. Under Lucretius's influence, then, Calvino throws off the combinatorics of Llull—the complete system with no need of an author—for a new approach: in order to access the taboo material of the unconscious—without which there can be no true art—it is necessary to apply *and overrule* a system of constraint. As Perec puts it, "when a system of constraints is established, there must also be anti-constraint 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*. . . . According to Klee, 'Genius is the error in the system'" (qtd. and trans. in Motte 19–20). For Perec the key is *constraint* and *anticonstraint*, for Calvino *combinatorics* and *anticombinatorics*. The *clinamen* represents the later Calvino's rejoinder to the mocking critiques of authorial expression made by the Oulipo's founding members, not to mention Barthes' sneering rhetorical question from "Death of the

[15] Although at this point (unlike the earlier sentence with its B-movie horrors standing in for the psychoanalytic unconscious) Calvino seems on the verge of mentioning his master by name, it is not to happen. The name of the father apparently cannot be spoken, and Freud's cameo is in disguised form as Sigismund of Vindobona (the Roman name for Vienna).

Author": "Did he wish to *express himself*?" (54). The author, having earlier been replaced by a machine in "Cybernetics and Ghosts," is now welcomed back into the project of *anti*combinatorial writing.

Birkbeck College, University of London

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