The Magical Number Seven and the Early Romance Poetry

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Our capacity to perceive and memorize information is limited to approximately seven (plus or minus two) elements. An element can be defined either as a single bit or as a coherent sequence of organized bits. This article hypothesizes that, even without explicit theorization, such a rule was working on the earliest writers who first handled accentual prosody, i.e. the 12th and 13th century European poets. In their poetry, one can note a general trend to move towards a "seven-unit disposition" of syllables, verses and strophes. Another evidence of my hypothesis is shown by the greater prevalence rate of this disposition in orally-spread poems than in written ones.

1.   The Magical Number Seven

On 1956, George A. Miller published a well-known article that, in the years that followed, influenced many of the basic paradigms of cognitive pyschology. After quoting previous works, Miller reached some important conclusions:

1) Every person possesses a specific "span of attention", i.e. the ability of instantly estimate, without counting, the number of dots they see. A recent experiment[1] showed that "below seven [dots] the subjects were said to *subitize*; above seven they were said to *estimate*"[2].

2) In the same way, everyone possesses a "span of absolute judgment", i.e. "a clear and definite limit to the accuracy with which we can identify absolutely the magnitude of a unidimensional stimulus variable"[3].

3) Finally, we all know that we possess a "span of immediate memory"—or working memory—quantifiable around approximately seven elements (such as telephone numbers or license plates).

These three spans, says Miller, are NOT—as we could suppose—various characteristics of the same mechanism, but three different processes that encode our limitations regarding the elaboration of information.

Miller also noticed our capacity towards "organizing or grouping the input into familiar units or chunks"[4]. We are able to recall seven (plus or minus two) letters randomly selected from the alphabet, but we have exactly the same level of difficulty in recalling seven monosyllables, or even seven words. The individual bits (in this case, letters) are amalgamated to create chunks

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[1] Kaufman *et al*. 1949.

[2] Miller 1956.

[3] *Ibid*.

[4] *Ibid*.

(monosyllables, words) that are always larger: a process called "recoding". What really determines our perceptual-mnemonic capacity is the possibility of organizing information in segments *familiar* to us, as long as they do not exceed the standard length of seven (plus or minus two) elements.

My hypothesis is: if, as we know, early romance poetry was produced, used and diffused essentially with oral modalities, then Miller's Law should have been applied, possibly unconsciously, in many contemporary poems: to wit, in the syllabic organization of the verses, in the organization of the verses of the stanzas, in the organization of the stanzas of the whole poem. Moreover, it should also have generated a real tension between the decrease of mnemonic bits, in order to help learning, and the opposing tendency to increase them to extend the quantity of information: the equilibrium, according to my thesis, would be close to the number seven, plus or minus two (an example of a perfect song is *Lanquan li jorn son lonc en mai*, composed by seven *coblas* each constituted by seven *octosyllabes*). This way would be the more economical for promoting the retentiveness of both the *joglars* and his public.

2.   Six, Eight or Ten Syllables?

From the 1980s, Miller's article began to be appreciated also among philologists. I believe that the first to bring together the two fields was Benoît de Cornulier, who proposed the "loi des huit syllabes", which states that "en français, au-delà de huit, le nombre syllabique exact est inaccessible à la perception"[5]. Beyond this limit, listeners could not perceive the isosyllabism of a specific verse (notice that we are close to the previously defined "span of attention"). Thus, for verses longer than eight syllables, the presence of the caesura, i.e. "la frontière sémantique la plus évidente dans l'intervalle où formellement on peut s'attendre à la trouver"[6], becomes fundamental. If, up to eight syllables, the caesura is an optional, possibly ornamental element, beyond this limit the caesura is indispensable to perceive the relative length (i.e. the equality or diversity of a verse compared with the others) of the verse analyzed.

In 1984, in a review of his previous *Théorie du vers*, Pietro G. Beltrami hypothesizes a corresponding "teoria delle sei sillabe" in Italian, stating that the septenary is "il più lungo dei versi italiani nel quale la disposizione interna degli accenti sia veramente libera"[7]. To support his hypothesis, Beltrami gives the example of the hendecasyllable that, despite the frequent synalepha between hemistichs (with consequent weakening of the caesura), has to be regarded to all effects as a "composed verse", according to Cornulier's theory. The maximum limit in Italian, following this rule, should not be eight, but seven syllables (the definition "teoria delle sei sillabe" is, in fact, deceptive, in its highlighting where the stress is set, but not the quantity of information that, in a paroxytone language, the recipient is able to memorize).

Sansone and Canettieri disagree with Beltrami (but not with Miller); the first finds in the octonary a very mobile secondary accent, which generates an enhanced number of metric combinations, as 2-7, 3-7, 4-7, 1-3-7, 1-4-7, 1-5-7, 2-5-7, 3-5-7, 1-3-5-7. Starting from the novenary, the poetic use selected a more limited quantity of variations (3-8, 4-8, 2-5-8)[8]. Therefore, according to Cornulier, if the caesura takes fixed forms only when we lose the perception of the syllabic quantity, the maximum limit in Italian must be set, not at seven, but at nine syllables (i.e. the octonary).

[5] Cornulier 1995, p. 47.

[6] *Ibid.*, p. 51.

[7] Beltrami 1984, p. 593.

[8] Sansone 1988, pp. 74 ss.

Lastly, analyzing the metric sources of the song *Quando eu stava in le tu' cathene*, Canettieri—more than raising Italian's users's cognitive abilities—declares that the upper limit of this song (apparently moved to a maximum of ten elements) "sia da attribuire alla fattura del componimento in un contesto di tendenziale artificiosità e a una ricezione comunque non 'naturale' più che a una differente potenzialità di percezione metrica fra 'antichi' e 'moderni'"[9].

These are, in synthesis, the most relevant theories on this subject. In the next paragraph, I am going to present the data obtained from the analysis of the metric *corpora* of early romance poetry[10]. It was obvious, for both the early poets and for the modern scholars, that the syllabic quantity was connected with mnemonic proceedings (cf. *infra*, § 4); the novelty of this work consists instead of the application of the same method at the human retentiveness of verses and stanzas.

3.   Some Clarifications

The proceeding I used to obtain the data that we are going to analyze is the following: thanks to the consultation of a private database (ed. Enrico Zimei), I easily made a table including, for each romance lyric *corpus*, the three variables just described. Then I calculated the respective percentages, to not be forced working with absolute data. Ultimately I derived three histograms, needing some visual description to handle easier the data, and to encompass better the three phenomena. Some clarifications are in order:

1) As the histogram is, by necessity, a simplified outline, I have purposely excluded the most noticeable deviations from the norm—for example, the 44 verses of the single *cobla* of *Maint baro ses lei* (cf. Vatteroni 1999, pp. 144-148) or the 33 verses of each stanza of *Roïne celestre* (cf. Koenig 1955, I, pp. 32-36);

2) The general analysis has been conducted on the current metric repertories, that have sometimes been refuted by later studies on specific topics—e.g., concerning the apocryphal stanzas, or the subdivision of the internal verses and rhymes—conducted after publication of the repertories;

3) The same *corpora*, are not only prone to error, but are often also incomplete. The basis for my analysis, despite defective data sampling, is the vastness of the poetic corpus examined, which is why the above-mentioned errors do not condition the results of my analysis in a statistically significant way.

Let me start with the subject that most interested Italian and French philologists: the maximum number of syllables that a single verse can contain.

4.   Syllables per Verse

Nobody, today, would deny that syllabic quantity influences the learning and memorizing processes of a text. It is also clear that, in France, the more suitable verse is the *octosyllabe*, which corresponds, in Italian, not to the equivalent *novenario*, but to the *ottosillabo*. Basically, all the early romance texts—from the *Saint Léger* and the *Passion* of Clermont-Ferrand to Chrétien de Troyes's romances, from the *Tristan* of Thomas and Béroul to the provençal *Flamenca* and *Jaufre*—were written in *octosyllabe couplets*. Moreover, almost all short stories in verses (*miracles*, *contes dévots*, the *Roman de renart* and most of *lais* and *fabliaux)* were handed down in octosyllables . Even some theatrical performances, though with greater metrical variety, present long passages in octosyllables, e.g., *Aucassin et Nicolette*, the *Jeu d'Adam*, or the *Jeu de Saint Nicolas*.

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[9] Canettieri 2002, p. 151.

[10] The metric repertories utilized are indicated in bibliography.

One, noticeable exception are the *chansons de geste*, which use predominantly monorhyme laisses of decasyllables (and, rarely, of octosyllables and alexandrines). This can be seen as contrary to my hypotesis, but may be explained by Fassò's suggestion to consider almost all the *chansons de geste* as later reshuffles of ancient versions composed in *octosyllabes*, orally diffused and nowadays lost[11]. The confirmation of this theory would bear out the pre-eminence of the octosyllable for orally-diffused texts.

Following this general overview of medieval literature, including the narrative, I would like to analyze lyric poetry in more detail.
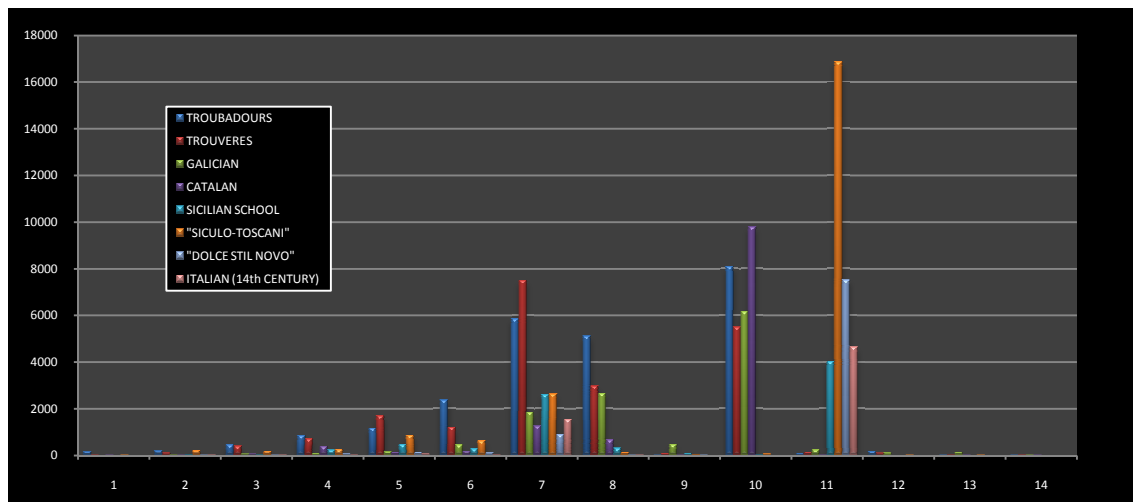
This histogram, concerning the number of syllables per verse, is apparently easy to read, but holds some snares. We can immediately notice that, except for the *trouvères*, all the *corpora* show a marked tendency for verses to be accentuated on the tenth syllable; a phenomenon even more detectable in Italian and Catalan poetry. This is in contrast to the "seven plus or minus two" rule and I will discuss this in depth in section § 7. For the moment, le me state that they are not an obstacle to my hypothesis; but, on the contrary, will serve as critical cross-check.

In the remaining part of the table, including verses in which the caesura is not indispensable to make the isosyllabism perceptible (cf. § 2), we notice that troubadours, trouveurs and Galicians show a similar allocation for the different metres. The apex is at seven for the troubadours and trouveurs, and eight for the Galicians. This is the highest limit set by Miller's Law, and also in line with my hypothesis that the attentive and mnemonic processes could not be extended beyond that limit.

In conclusion, let me explain that novenary/ennéasyllabe and alexandrines are deliberately missing from the chart. The first was regarded as an "ugly" type of verse, aesthetically imperfect, as can be seen by Dante's comments regarding Italian ("Neasillabum vero, quia triplicatum trisillabum videbatur, vel nunquam in honore fuit vel propter fastidium absolevit"; *De Vulgari Eloquentia*, II, V, 6) and the *Leys d'Amors* with regard to Provençal ("E devetz saber que lunhs bordos no deu esser de .ix. sillabas quar non ha bela cazensa"; ed. Gatien-Arnoult, I, p. 102; notice that the two metres are not equivalents, as the stress is positioned differently). The quotations do not express a personal point of view, but a conviction generally held in the era

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[11] Fassò 1989. The scholar justifies his conjecture with cultural, metric and syntactical proofs.

they were written. This is clearly a case where cultural convention prevails over instinct, where *nurture* triumphs over *nature;* therefore, it is not surprising that such general censure for this type of verse prevented its adoption. [12].

Alexandrine verse, on the contrary, was largely used in early literature, especially in epic French poetry, but I have focused my attention on the lyric corpus, i.e. the poems of the trouveurs, which is why the alexandrine is absent my table. However, if the alexandrine is viewed as the sum of two *hexasyllabes* (another metre easy to memorize), this would indeed support my hypothesis.

5.   Verses per Stanza
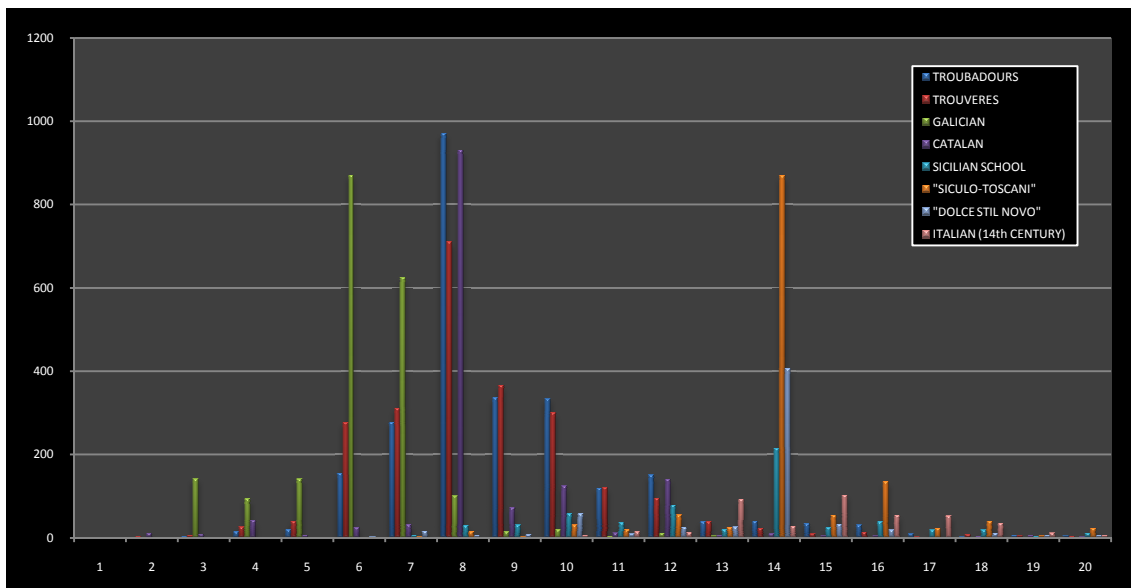
This table is based on a dichotomy: on one hand troubadours, trouveurs, catalans —though less so—Galicians, where the total number of the verses seldom exceeds ten; on the other, the whole Italian corpus, based on the sonnet's fourteen verses. However, as mentioned before, deviations from the norm will be discussed in paragraph § 7; for the moment, I would like to analyze the first group's data.

In this case, the "seven plus or minus two" rule is kept to so strictly that it could be defined as "seven plus or minus one". In fact, the use of six, seven and eight verses per stanza is considerably greater than the use of all other verse structures. In addition, both Galicians and Catalans clearly prefer one (or maximum two) strophic structures, whereas every other possibility essentially disappears in poetic use. On the contrary, the data are less coded for troubadours and trouveurs and their use of the stanzas forms a near Gaussian function with apex of eight, as can be seen in the next chart.

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[12] It would be interesting to verify if the aversion to the novenary could be found in its odd position, half-way between the easily memorisable octonary (without caesura) and the formally-structured verse hendecasyllable. Canettieri maintains that "per l'apprezzamento estetico del ritmo da parte dell'uomo è fondamentale la percettibilità di esso: quindi che la *durata* del verso non ecceda la capacità della memoria"; cf. Canettieri 1998, p. 152.
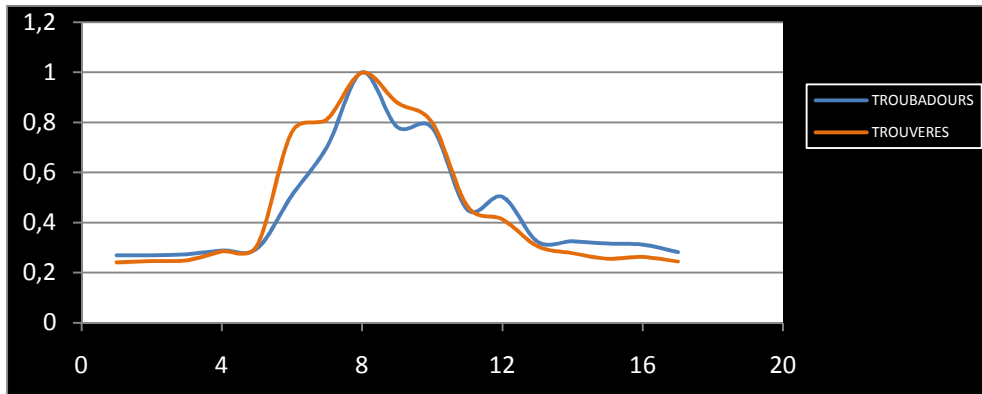
What do these data indicate? My hypothesis is that initially, when the early vernacular poets had to handle a new kind of metre—accentuative instead of quantitative—experiments towards finding the best form multiplied, sometimes reaching unusual results, which were quickly abandoned[13]. However, after the trouveurs and troubadours, a strophic structure with eight verses per stanza, plus or minus two, prevailed, as per Miller's Law. Later, following the experimental phase, the poets could make full use of their predecessor's results, directly utilizing the strophic forms they regarded as best and ignoring the others. The Catalans adopted eight verses as their ideal best stanza, the Galicians , six or seven.

6. Stanzas per Composition
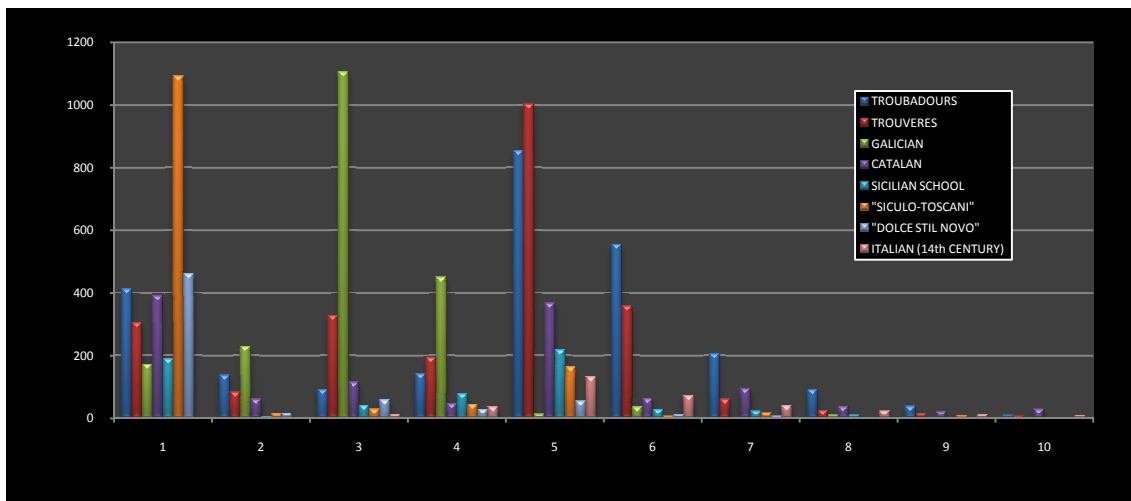
The last chart presents the greatest hermeneutical problems. Based on the well-known Italian preference for the sonnet, a consequent preference for one stanza poems can be seen (this will be discussed in the following chapter).

The analysis of the remaining compositions will be divided into troubadours, trouveurs and Catalans on one side, and Galicians on the other.

The first group shows homogeneity. Songs showing five stanzas are the majority (30-40%), followed by six stanza songs (20%, excepting the Catalans), and they progressively decrease in

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[13] A typical case is that of Guilhem IX, whose verses were probably parodied in the rambaldian *devinalh*.

both directions of the graphic. The number of poems constituted only by one stanza in this group is noticeable, but this can be explained by a large circulation of *coblas esparsas*. The reason why we are beside the lower ranges of Miller's Law is that the information content of a stanza is greater than that of a syllable, or even of a single verse, so that our mnemonic ability tends to be reduced.

The Lusitanian poets seem to prefer shorter *cantigas*, generally composed of three or, at most, four stanzas. If this is partly true, which conflicts with previous data, we can agree with Tavani that this situation was also a result of the "povertà testimoniale e la sterilità della tradizione"[14] of the Galician poems. As the majority of their works were distributed through a sole manuscript, most have come down to us in mutilated and fragmented form. Presumably the total number of stanzas was greater than now known. I hypothesize that there would not be a great divergence from the results in the rest of Europe.

7. The Italian Instance

My premise is based on the cognitive hypothesis that the number of syllables, verses and stanzas would harmoniously tend towards seven to facilitate the perception, learning and memorization of songs. It has also been established that—with few exceptions—this is what happened north of the Alps; whereas in Italy, starting with the Sicilian school, writers took another road. With the "invention" of the sonnet, we witness—compared to the troubadour models—a "dilatazione 'orizzontale'della parola", i.e. an average of eleven syllables per verse, and a corresponding "'allungamento' verticale"[15], with content in the aberrant form of a monostrophic fourteen–verse compound.

I would suggest a simple explanation: at the same way as a positive correlation between Miller's Law and oral fruition can be demonstrated, a *negative* bijection between the same rule and *written* fruition mode should also exist. In other words, when the sonnet took the place of the *canso*; when an irreversible separation between music and poetry took place[16]; when poetry began to be *read* (and not just listened), it became less important to respect the limits of "seven plus or minus two", and poetic speech was released from its mnemonic requirements.

It should be added that, not only the sonnet, but also the *canzone*, having lost its oral features, profoundly changed its structure, attaining a metrical and rhymical complexity that was unusual and impossible to perceive and memorize without the help of a written outline. This last point is in perfect harmony with the hypothesis presented here.

8. Conclusion

So far I have discussed "Miller's Law", or a "seven plus or minus two" rule, which *acted on* the poets, *pushing* them towards the use of specific strophic-metric-syllabic patterns. I believe it is important to underline two points:

1) "Miller's Law" is not a physical law, *acting* on material objects. It can be defined rather as a cognitive process whose general outlines, human beings (in this case, writers of poetry) instinctively tend to follow. In the same way Darwin, with the insight and discernment typical of men of genius, remarked that to state that natural selection "acts" is a mere *linguistic expedient* to state that a series of physical phenomena ensure that the best suited organisms have greater probabilities of survival. His exact words also support my thesis: "So again it is difficult to avoid personifying the word Nature;

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[14] Tavani 2000; cf. also Tavani 1969, particularly § 2.1: *Tradizione povera, tradizione sterile*.
[15] Antonelli 1989, p. 69.
[16] Roncaglia 1978.

but I mean by Nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us"[17].

2) Even though this process happened at an unconscious cognitive level, and not through explicit awareness of an acknowledged tenet, by the time of the decline of the *trobar* this same rule was somehow already perceived and encoded. Thus, the *Leys d'Amors* describe an important phenomenon:

> En aquest bordonetz [*in verses accented on the fourth syllable*] non ha pauza suspensiva. e ges per so non es vicios us dictatz daytals bordos. jaciaysso ques en alqus sia pauza suspensiva. et en alqus no. quar indiferens so. et ayssi meteysh son indiferen. li bordo de. vj. sillabas et de viij.[18]

This is the same mechanism that induced Cornulier to postulate the existence of a "loi des huit syllabes": while the measure of the verse is orally perceptible, the caesura is optional; but when the measure cannot be distinguished, the caesura becomes compulsory. The first theorical system of troubadour's lyric distinctly shows this phenomenon, though without understanding of all the complex neuronic reasons that, in the shadow of this phenomenon, silently acted and contributed to Poetry's advance.

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[17] Darwin (1859) 2003, p. 89.
[18] Ed. Gatien-Arnoult, p. 132.

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