

POESIA EXPERIMENTAL

Poesia Experimental Portuguesa
Cadernos e Catálogos

Volume 2

Releituras e
recriações em
meio digital

Rui Torres, org.



Poetic Transformations in(to) the Digital

{Friedrich W. Block & Rui Torres}

Artigo co-escrito no âmbito do projecto *CD-ROM da PO.EX* (financiado pela FCT através do POCI2010), a aguardar publicação nas Actas do e-poetry 2007, realizado na Univ. Paris.

Introduction

In our contribution we will discuss some projects in the field of digital poetics which transform or recreate poetic pre-texts that were not conceived for the electronic space. Our interest is to focus on the question of the site of digital poetics, i.e., on its discursive or systemic affiliation. These projects of transformation imply a justification: We derive digital poetics not primarily from theories or discourses of information and communication technology or the digital media culture, but from theories and histories of poetry and “language art” itself. While doing so, we do not ignore that electronic or computer poetry is turning problems of the actual media and technological culture, as well as its theoretical description, into poetological and artistic categories and categorization. The perspective on art itself means, quoting from Loss Glazier (2004),^[1] “Siting the ‘poetry’ in e-poetry, which means to read digital poetics against its poetological and historical background.”

The examples that will be discussed refer to the tradition and evolution of language art by means of intertextuality. We will be looking at an art which puts on stage, above all, language itself, in a self-referential way. Ever since, poetry has been art with language in all its dimensions. The conceptual concentration on special linguistic aspects has led to specific forms of language art throughout the history of poetics: the poetization of the graphemic aspect in visual poetry, the phonetic aspect in sound poetry, or the poetization of the grammatical aspect in combinatory and algorithmic poetry.

The connection with such “traditional” lines of language art has been recently emphasized by the digital poetics’ discourse. This especially counts for the linking to concrete poetry, thus involving the question of whether continuity or difference and innovation can be registered here. Focusing on the aspect of continuity, Roberto Simanowski (2004)^[2] asks whether certain – in his view questionable – tendencies would have survived such as the tendency to an aesthetics of the spectacle when the pure visual, and in analogy the pure code, would be followed by a loss of meaning. This skepticism towards the spectacle should perhaps be addressed not to codework, but rather to some multimedia interactive installations. Anna Schaffner (2006, p. 17)^[3] follows the short circuit between poetics and the innovation of technology, stating that “concrete poetry seems to have anticipated the new digital medium, where many of its conceptual premises can be literally effectuated and realised.” On the other hand, it is interesting how Manuel Portela (2006),^[4] for example, describes concrete poetry with concepts and terminology of digital poetics, by examining this embracing of electronic media by concrete poets. For more than a decade Florian Cramer has also developed his studies about poetic calculations and the imagination of the self-executing text in this direction from the present back to ancient time.^[5]

By selecting transformations which interpret the language art of predecessors, we understand them as a contribution and a reflection of the aesthetic program of experimental writing as it has developed since the 1950s. This is a period of time that has witnessed the beginning of poetic movements such as Lettrism, Concrete Poetry, and Oulipo, as well as the time of a new era of sound and visual poetry or intermedial poetry.

Framing digital poetics within the program of experimental writing of this period is methodologically starting with poetological semantics. Aesthetic programs consist of certain strategies, principles, values, working attitudes, questions and objectives which single artistic events and manifestations orient and control with pre or post interventions according to poetics. Programs occur in various levels of complexity which may cross each other. They develop intrinsic values and the specifics of these have to be indicated - usually with type or genre titles or, if required, with group or movement names.

From the beginning, experimentation as a program concept has been intended not so much to aid the classification of certain texts, but rather to help us orient in a certain poetic setting repeatedly said to have the following common criteria:

- the interest in a work being with, rather than in, the language, i.e. the concentration on its semantics and material aspects as well as its use in connection with other sign systems;
- the experiment with new perception and communication media;
- to make the processes of producing and understanding aesthetic forms a central theme;
- linkage and integration, and therefore also extension, of media and procedures used in more traditional forms of art;
- the connection of literature with other arts - particularly with contemporary developments in the fine arts and music - and also with science and politics, the reflection on the limits of literature / poetry / art;
- the very rational and cognitively oriented attitude of the producers;
- their cooperation in groups and their international integration.

Out of this setting, we suggest five conceptual principles, which have specifically changed or expanded in digital poetics: medial self-reference, processuality, interactivity, intermediality, and networking.^[6]

The particular realization and specification of these relatively abstract concepts offers an orientation for the description and assessment of transformations and recreations in(to) the digital. However, the observation of modifications has to focus on both the gestalt and the underlying idea or concept of the specific project. We have to ask whether certain poetological problems are continuously worked out or whether new perspectives are presented. In short, we aim at asking: Can we state re-evaluations?

This leads to certain questions related to the achievements and functions of poetic transformations:

- Is a certain transformation designed as an artwork or artistic project of its own? If so, would it then be conceived to belong to the poetic program that the pre-text is representing? Or could we instead observe an opposition, perhaps as travesty or parody? Could this new work convincingly claim to be innovative or would it rather mean a trivialization of the pre-text?
- Is the recreation meant to be a translation or transmedialization? In these cases, we could discuss how appropriate it was created as compared with the pre-text.
- Do we have to assess the transformation not as an artistic expression on its own but as a creative reading and interpretation of the pre-text in a new technical environment – be it for research or for didactical mediation?

We will now discuss some examples from Portugal and Germany against this theoretical background. We offer two perspectives: an “internal” one reflects the production aesthetics of recreations (Torres) and an “external” one discusses projects from a reception aesthetic point of view (Block).

Poesia Encontrada by António Aragão

António Aragão (1924-) was the organizer of many publications of experimental poetry in Portugal. He has developed many pioneering experiences with electrography, photocopy, collage, or image-writing, and his work, very poorly published and mostly unavailable, is nonetheless acknowledged by all poets of the group as very innovative and influencing.

In trying to explain his collage-poems, Aragão writes that these cases of “found poetry” come entirely from the newspapers, claiming that the “malleability of the expression allows for several readings.”^[7] He further explains that “We supply one reading (...) [and] we leave also to the reader the possibility to make other readings, in other words, to do, to a certain extent, his/her poem.”^[8] This openness of the original text, as well as its projected fragmentation and accepted indeterminacy, can be well developed in digital media, given that cybertexts can be dynamic, open and randomly generated.

Aragão also predicted that this type of poetry, based as it is on everyday reality itself, “transforms and recreates reality in one another, an implausible one”. And he additionally maintains that “poetry has always varied its expression. (...) The incessant search for new and different expressions, which pervades all the arts, is tremendously provoked by the necessity of knowing and of giving (all) realities of the human spirit. Undoubtedly, the conquest of other expressions, instead of destroying poetry, is its way of passing through time, and it is its continuous and inexhaustible power of metamorphosis that confers it with validity and presence in the world.”



Fig. 1 - Poemas encontrados de António Aragão

We believe that a work with these characteristics – impermanence, openness, indeterminacy – can be developed in a new form of expression, in a new medium, thus representing an interpretation of the pre-text in a new technical environment, in this case, the Internet. In truth, these found poems are based on the incompleteness and the indeterminacy of the text that supports them, because the text would differ according to the changes in the newspapers, in addition to the fact that the spatialization of the text in the collage also creates different readings and combinations.

For the recreation of these found poems we have used Jared Tarbel's Actionscript code of "The Emotion Fractal", "a recursive space filling algorithm"^[9] which places an arbitrarily sized word anywhere within a given rectangular area. In this way, we expect to put forward medial self-reference, in that the visual expressiveness of language is used in random typographic events that occur on the page. In effect, the words and expressions taken from online newspapers are spatialized on the screen in a random manner, imitating the collage aesthetics that seems to be implied in Aragão's project.

On the other hand, as Tarbel explains, the effect of this code is "a region of space completely filled with increasingly smaller type. (...) The actual word placed is randomly determined, taken from a predefined list of English words." In this case, however, the text, instead of being a copy of Aragão's original collages, i.e., instead of being a reproduction of the pre-text, is dynamically pulled from rss feeds of online newspapers on the web. The result of this php script is an ever-changing, dynamic collage, different every time it is accessed: both visually and verbally. At the same time, this recreation reflects the poetological category of networking: the poem is live updated from web servers, being its text dependent on those changes.



Fig. 2 - Digital rewriting of Poesia encontrada, followed by collage taken from The New York Times (18 July 2008)

Máquina de Emaranhar Paisagens by Herberto Helder and Pedro Barbosa

Herberto Helder (1930-) was the co-organizer, with Aragão, of the first review of experimental poetry in Portugal, the *Cadernos da Poesia Experimental* (1964). His initial experimental works are mainly influenced by the combinatory technique. In the postscript of *Electronicolírica*,^[10] he mentions an experience that Italian poet Nanni Balestrini did in 1961, with early computer-generated poetry (“Tape Mark I”). Balestrini, Helder reminds us, “choosing some fragments of ancient and modern texts, has supplied them to an electronic calculator that, with them, organized, according to certain combinatory rules previously established, 3002 combinations, later selected”. Helder could have mentioned the OULIPO experiences as well. In any case, he did not have access to a computer, like Balestrini did, neither did he have a literary context in which to develop his ideas. And so, he practiced this technique in different ways. In his poem “Máquina de emaranhar paisagens”, Helder freely combines fragments of the books of Genesis and Apocalypse, as well as François Villon’s, Dante’s, Camões’ and his own, by using combinatory processes, inter and intra-textual, of a great complexity. And he clarifies that his method of poetic creation is stimulated by a process of transference and combination, one from which springs a similarity with “some magic primitive texts, some popular poetry, some medieval lyricism”,^[11] thus creating a peculiar “ritual magic formula, of which the popular refrain and the medieval parallelism is a trace, as the ballads of the poetry of the *Cancioneiros* seem to illustrate”.^[12] Helder ends up concluding that “(the) combinatory principle is, indeed, the linguistic base of all poetic creation”.^[13]

These works of Herberto Helder were expanded by Pedro Barbosa (1950-) in some of his experiments with computer-generated poetry. Barbosa has been developing poetry with the help of computers since 1976.^[14] A pioneer of computer-generated literature, he has had, for the realization of his virtual texts, the collaboration of several programmers, but in all of his projects the literary algorithms are of his authorship. In harmony with the movement of dialogic relations which we have referred, among his first cybernetic poems one can find links to the experiments abovementioned, namely

the development of the “Máquina de Emaranhar Paisagens”. Pedro Barbosa was proposing a “renovation of the literary experimentalism in computer-generated literature”, envisaging the processes of transformation and transposition that the transition of the printed to the digital entails.^[15]

At the same time, his resulting virtual text is an open work: a work in movement, incomplete and indeterminate. As with all generative literature, the virtual represents the possibility to have many different results from the same code. And there is also a place for the reader to interact with the text-program, by means of an active readership.

Húmus by Herberto Helder

The first publication of Herberto Helder’s Humus has the suggestive subtitle of “Montage-poem”, and in truth this is an intertextual work which uses and transforms the “words, sentences, fragments, images, [and] metaphors” of the homonymous text of novelist Raul Brandão. Helder explains this type of re-writing as archetypal: “there is only one law that includes so much the world of the things as that of the imagination. That law is the law of metamorphosis.” (1964: 5)

This intertextual poem is currently being recreated as a set of virtual texts programmed in Actionscript which are dynamically animated, by means of random substitutions, using the original lexicon of Raul Brandão’s Húmus, a text which was studied and classified in terms of statistical frequency and grammatical position. These lists, which constitute a digital fenotext, are indexed in xml lists of words, which are accessible to the reader in many different ways.

However, this is not merely a combinatory recreation of the literary algorithm conceived (or imagined) by Helder, given that the permutation of the text is also inscribed in the sound generation and in the visual matrix. Every time that a word changes on the screen, a sound and an image are also transformed into their algorithmic equivalent new self, thus becoming a triple layer process: a calculator of interconnected possibilities of text, sound and image. This medial self-reference is an appeal to the concrete materiality of language, and the verbivocovisual expressiveness of language

is explored by hypermedial means. But, perhaps most importantly, this recreation aims at being an immersive experience, exploring intermediality, through its extensive usage of integrated multimedia data within interface programming.

The reader can recreate these lists of words, adapting the poem to his/her own taste; s/he can also send, whenever desired, the achieved realisations to a php server, where they are recorded. This process of interactivity is based on networking, granting the recreation with a possibility of collaborative writing and consequently of collective knowledge. Moreover, as the several variations and versions of virtual readers are archived on web servers, it is possible to send this data to rss feeders, PDAs, cellular phones, instant messengers, or through podCasting.

Oskarine by Ulrike Gabriel and Oskar Pastior

In 2003 software artist Ulrike Gabriel (1964-) created the Oskarine, a project which takes in the poetry of the Romanian-German writer Oskar Pastior (1927-2006). Oskar Pastior counts as one of the most fascinating poets of German language of the 20th century. The dominant principle of his writing is the restricting rule of a poetic algorithm which Pastior conceived to be textual generator. Accordingly, he renewed various old and partly forgotten forms of combinatory poetics such as the anagram, the palindrome, the sonnet, the sestina, the pantum or the villanelle. It isn't a surprise that Pastior was the only German speaking member of the international OULIPO group. As a complement of the scriptural aspect of his work, there is also sound: Pastior's poems develop in a quite specific way by oral presentation, and Pastior's voice, with its Romanian-German accent and its individual rhythm and melody, has distinctively coined the reception of his oeuvre.

All these aspects play an important role in the Oskarine project which Ulrike Gabriel developed in close collaboration with Oskar Pastior. Oskarine is a poetry machine which generates virtual Pastior poems and displays them with his voice. Gabriel selected several of his poems with strict algorithms. These are especially the forms of

the pantum, the sestina, and the sonnet which were programmed in Java. The pantum, for example, is a poetic form that came from Malaysia to France about 150 years ago. It has an open amount of stanzas of four lines each. The second and the fourth line of a stanza appear as the first and the third line of the following stanza, while the last stanza of the poem includes line 1 and 3 of the first stanza as line 2 and 4 to complete the permutation. Pastior recited his particular poem which was recorded and then cut into the units for permutation, that is to say, into audio samples. Following the respective algorithm, the program creates numerous variations of the poem, as well as its reading, respectively. At the same time, the program displays each selected text unit on the screen as a nearly transparent animated line being joined by the following lines. As the permutation continues, this visual text becomes denser and more opaque, thus transforming itself into a scriptural image.

The interest of Gabriel and other software artists in Pastior's poems is obviously caused by an impression of affinity. This concerns both the self-reference and the processuality of the self-executing text. Another crucial point is the old question of how close the machine could come to the poet, and in exactly which respect we have to realise the differences. The simulative aspect of the Oskarine appears to be remarkable in the first moment. However, we have to state important differences concerning both the methods and the concepts.

We observe an autopoetic mechanism inscribed into the pantum, the sestina, or the sonnet. Pastior is interested in exposing himself as a subject (in the ambivalent sense of being self and submission) to this auto-activity of language and text. Under such constraint, his writing process aims at finding formulations which are as fine and ingenious as possible. This is part of the play between determinacy and indeterminacy. As distinct to the machine concept, it is not decisive for Pastior to program the algorithm correctly. By using this algorithm, he rather tries to find and combine letters, sounds, and words – often neologisms or new elements of the individual Pastior's language – in such a way that they fit together tonally, visually, and semantically. This process results in the creation of surprising relations and tensions. For example, while the Oskarine has to polish the cuts between the samples as clean as possible, Pastior concentrates on such cuts in order to put them into tension and reflection. While the

Oskarine is constantly and strictly or stubbornly permuting the units which were been pre-fabricated by Pastior, such a process certainly belongs to the creating process of the author, but for him it is just a method to achieve a consistent and unique result. He rather uses the algorithm with the intention of inventing various different poetic forms, and by working with additional rules within a cycle of poems. In brief, the machine has a lack of imagination and it is missing the unique modulation of an individual reading.

However, to offer such a reflection on differences proves the impressive aesthetic value of the Oskarine. Conceptually, the project doesn't just want to simulate the author, but to stage a game between the similarity and difference of two different generative processes, between program and poem, between machine and author as precise as possible. The visual poetry of the Oskarine is symbolising this game like a commentary, by intermedially changing between word and image, chaos and order. Compared to Pastior, Gabriel's artistic concept is situated on another, more abstract level of observation, but it has to do with similar questions. In the hypermedial composition of various codes, it also presents a great mastery. In our view, this conceptual, as well as formal, density proves this project to be a first-rank artwork on its own. And beyond, it is an exceptional reading and interpretation of Pastior's poetry.

Stochastische Texte by Theo Lutz and Free Lutz by Johannes Auer

The very first computer generated text was presented in 1959. Theo Lutz (1932-), a young student of informatics at the University of Technology (TH) Stuttgart, created what he called Stochastische Texte (Stochastic Texts) using the Zuse Z 22 electronic mainframe. Lutz published the result of his project as an essay in *augenblick*,^[16] a journal of aesthetics edited by his professor Max Bense (1910-1990). Bense was a professor of philosophy and science theory as well as a writer. Since 1950 he published pioneering contributions to a rationalistic theory of art based on semiotics and information theory.^[17] His text aesthetics from 1960 present the conceptual context in which the Stochastic Texts were developed: the turn from idealistic subjectivity to rationalism and objectivity of art, to a programming of the beautiful, the turn from mystic creation to statistic innovation by "a realisation whose existence and perception is

based on throwing dice, on a selection of frequencies. One does not change from nothing into being but from the disorder of high entropy into the order of high information.”^[18]

These poetics were concretely realised by Theo Lutz. He programmed the “throw of dice” as a random generator for the Z 22 which produced grammatically correct “elementary sentences” from a storage of linguistic variables. The machine stores a certain number of subjects, predicates, logical operators, logical constants and the word “IST” (engl.: “IS”), coded as binary numbers. In several steps the program calculates various random numbers which determine the selection of stored variables to generate each sentence. The sentences were first coded as ticker tape and then printed on a telex machine.

The nouns and adjectives stored in the machine were taken from Franz Kafka’s famous novel *Das Schloss* (The Castle). It is quite interesting that neither this pre-decision was reflected conceptually nor the fact that Lutz had corrected some miss-spellings of the telex printout for the publication in *augenblick*. We suggest to call this blind spot a latently subjective and romantic factor.

Here we see the starting point of the Free Lutz project (2005) in which net-artist Johannes Auer (1962-) transformed the *Stochastic Texts.php*. The processing of elementary sentences as they were generated on the Z 22 can now be followed on the Internet.^{[19][20]} Auer conceived a series of extensions. The project allows the generation of sentences with or without the mistakes that Lutz had corrected. Additionally, the audience can interactively invent and write nouns and adjectives and select their gender to be integrated in the program’s writing process. As a result, the mentioned pre-decision which had not been reflected by Bense or Lutz becomes a conceptual part of the Free Lutz project. Hence two different forms of random generation are opposed and networked: the calculating program and the incalculable writing activity of the participating internet users. This aspect is supplied with another feature: Search entries which Internet users enter into the search engine *Fireball* are fed into the vocabulary of the generator in real time. Thus another text generator – the search engine including its users and the Internet as an open writing process – is self-referentially integrated into

the project. As follows, the project presents itself as complex networking of different forms of text generation. Finally, Auer conceived another interesting extension when he invited an actor to recite the sentences as soon as they appear on the screen during a performance or a live radio broadcasting. In this way the processuality is extended to an interaction between actor and audience, especially if the users would enter words with a special phonetic or semantic aspect like, for example, words with a difficult pronunciation or an obscene meaning. First of all Auer exactly re-programmed the generator in *However, for Free Lutz*

By his project Auer not only honoured and made accessible the Stochastic Texts, but he also offers to reflect the first computer text in relation to present Internet culture. The project conceives the contemporary complexity of digital culture by the recursive networking of several different forms of text generation and presentation. Aesthetically we realise a conceptual fusion of algorithmic and net poetics. It is interesting that Auer consciously integrates the subjective factor again. In doing so he raises a similar reflection like Ulrike Gabriel's *Oskarine*. In *Free Lutz* this reflexive subjectivity is realised when text is generated by the performance audience or the Internet users or, increased, as say "authentification" by the physical, vocal presence of the performing actor. This can also be interpreted as a critical, even deconstructive reading of Bense's aesthetics, as a re-evaluation: The radical calculation and statistical determinacy of the beautiful is opposed by indeterminacy and individuality. This link to Romanticism is dialectically outlined as a latent subtext of Bense's poetics.

Conclusion: Siting the "poetry" in e-poetry

Our discussion on achievements and functions of transformations in(to) the digital results in two perspectives:

Firstly we can observe how principles and methods which have been formulated within the experimental poetics program really urge to be continued, extended, experienced in electronic space. This means that forms and strategies of medial self-reference,

processuality, interactivity, intermediality, or networking as outlined by the pre-texts offer to develop their potential under the conditions of electronic writing. This view especially motivates the works of Barbosa and Torres in their intertextual reference to predecessors like Aragão and Helder.

Secondly we have shown that recreations within the program of poetic experiment lead to new interpretations and evaluations. This counts for the poetic conditions of both the pre-text and the project of its transformation. Assuming the general poetic staging of self-reference of language, or of the technological and cultural conditions of language use, we can notice a displacement of abstraction of meta-observations. And we can further notice a displacement of poetic values. In this respect it is interesting that the “subjective factor” (as reflexive subjectivity) becomes part of the game again. And particularly in digital poetics it is interesting to raise the question again: Who is speaking? Who is writing, programming, reading, viewing, reflecting, perceiving, feeling etc. – and under which conditions?

Thus we can observe both: continuation and change simultaneously and complementarily in the poetic domain. From this point of view, we shall provide some final remarks on siting the “poetry” in e-poetry:

Poetry/poiesis is a unique, flexible and dynamic mode of observation including self-observation. It creatively intrudes on its own general autopoiesis, by presentation, reflection, transformation, recreation, etc. Here, poiesis/poetry is the medium in which any creative mechanisms can be simulated and observed. In this sense, poetics also works self-referentially as technology (poietike techné). Particularly where poetics adapts itself to the culture of technology and relates this to its own means and procedures. It experiments with experiences on how technology literally makes sense between determinacy and indeterminacy, restriction and openness. “Literally” means that poetry, as language art, raises the linguisticity of the technology culture, as well as existing and new language techniques, and acts these out, condenses and recontextualizes them—in short, contaminates them poetically.

Poetry no longer progresses, instead, it constantly extends its possibilities. Attributes

like e-poetry, digital, cyber, visual, sound poetry etc. represent this. These are open concepts of orientation with which art communications organise themselves in factual, social and temporal ways. However, genres, or object areas that are clearly, aesthetically outlined, can hardly be defined by these concepts. Even if their academic use occasionally tries at standardisation and institutionalisation.

Poetry, as language art, is—in keeping with Umberto Eco—art in movement, inspired by a (renewed) performative turn. With this performance, borders within art, as well as other communication and sense systems are constantly moved, and the works of art and their protagonists are process orientated. In this sense poetry is not “progressive” but rather “prozessive Universalpoesie” (‘processive universal poetry’).

Notes

[1] Loss P. Glazer, “The Conditional Text. Siting the “poetry” in e-poetry,” in: Friedrich Block, Christiane Heibach & Karin Wenz (eds.): *Ästhetik digitaler Poesie / The Aesthetics of Digital Poetry*, Ostfildern-Ruit, Hatje-Cantz, 2004, p. 58-77.

[2] Roberto Simanowski, *Concrete Poetry in Digital Media. Its Predecessors, its Presence and its Future*, 2004 <<http://www.dichtung-digital.org/2004/3-Simanowski.htm>>.

[3] Anna Katharina Schaffner, *From Concrete to Digital: The Reconceptualisation fo Poetic Space*, 2006 <[www http://www.netzliteratur.net/schaffner/concrete_to_digital.pdf](http://www.netzliteratur.net/schaffner/concrete_to_digital.pdf)>.

[4] Manuel Portela, : “Concrete and Digital Poetics,” in: “*New Media Poetry and Poetics*” Special Issue, *Leonardo Electronic Almanac* Vol 14, No. 5 - 6 (2006). 25 Sep. 2006, <http://leoalmanac.org/journal/vol_14/lea_v14_n05-06/mportela.asp >.

[5] See Cramer’s excellent compilations of his studies: *Words Made Flesh. Culture, Code, Imagination*, 2006 <<http://www.netzliteratur.net/cramer/wordsmadefleshpdf.pdf>>; *Exe.cut[up]able statements. Poetische Kalküle und Phantasmen des selbstauführenden Texts*, Dissertation, Freie Universität Berlin, 2006.

[6] Cf. Friedrich W. Block, Christiane Heibach & Karin Wenz: “The Aesthetics of Digital Poetry: An Introduction”, in: Block, Heibach & Wenz (eds.): *p0es1s. The Aesthetics of Digital Poetry*, Ostfildern, Hatje-Cantz, 2004, p. 13-36.

[7] António Aragão, “Poesia encontrada”, *Cadernos da Poesia Experimental*, 1, Lisboa, Ed. Autor, 1964, p. 37.

[8] Idem, *ibidem*.

[9] <<http://levitated.net/daily/levEmotionFractal.html>>.

[10] Herberto Helder, “Posfácio”, in: *Electronicolirica*, Lisboa, Guimarães Editores, 1964.

[11] Idem, ibidem.

[12] Idem, ibidem.

[13] Idem, ibidem.

[14] *A Literatura Cibernética 1: autopoemas gerados por computador*, Porto, Edições Árvore, 1977; *A Literatura Cibernética 2: um sintetizador de narrativas*, Porto, Edições Árvore, 1980. *Teoria do Homem Sentado*, Porto, Edições Afrontamento, 1996. *O Motor Textual*, Porto, Edições UFP, 2001; *Máquinas Pensantes: aforismos gerados por computador*, Lisboa, Livros Horizonte, 1988.

[15] Pedro Barbosa, “A renovação do experimentalismo literário na Literatura Gerada por Computador”, in *Revista da UFP*, 2(1), p. 181-188, Maio de 1998.

[16] Theo Lutz, “Stochastische Texte”, in: *augenblick 1959* (1), p. 3-9, <http://www.stuttgarter-schule.de/lutz_schule_en.htm>.

[17] Max Bense: *Literaturmetaphysik. Der Schriftsteller in der technischen Welt*. Stuttgart 1950.

[18] Max Bense: *Programmierung des Schönen. Allgemeine Texttheorie und Textästhetik*. Baden-Baden 1960, p. 55, translation by fwb.

[19] <http://auer.netzliteratur.net/0_lutz/lutz_original.html>.

[20] < <http://copernicus.netzliteratur.net>>.