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# The movement of the poem in the 1960s: from circle and line to zero and one, from concretion to computation

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## ABSTRACT

Poetic form in the 1960s in Britain, and elsewhere, was affected by trans-disciplinary and trans-cultural influences that came fully into focus after the end of the Second World War. These were substantially iterated and theorized throughout the 1950s, paving the way for radical experiments in language during the following decade. Drawing on Paul Celan's observation that poetry maintains itself 'at its own extremity' (expanded by Lyon [1983. "Poetry and the Extremities of Language: From Concretism to Paul Celan." *Studies in 20th Century Literature* 8 (1): Article 5. Accessed September 20, 2016. doi:10.4148/2334-4415.1131] and Klink [2000. "You. An Introduction to Paul Celan." *The Iowa Review* 30 (1): 1–18. <http://ir.uiowa.edu/iowareview/vol30/iss1/2>], this article considers movement in the form and language of poetry in the post-war period. It looks at some specific examples of how this became manifest in Britain and at traversal connections to developments within other disciplines, not least in scientific and technological domains.

## ARTICLE HISTORY

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Zero and one is everything – the whole universe – and equally the circle and line, which is the futura typeface, can express everything.<sup>1</sup> (Hansjörg Mayer; [Figure 1](#))



The concrete poet, by leaving the firm ground stepped over and over by abstractions, the traditional solid ground of outward meaning, dives into the mysterious region of the becoming, to return from there, trembling, with new proper names, captive of nothingness. (Flusser [1967] 2013)

We still have to come to terms with technology and poetry.<sup>2</sup> (Jerome Rothenberg)

## Context

After the horrors of the Second World War, the function and role of language was subject to deep scrutiny by many writers and philosophers and particularly those

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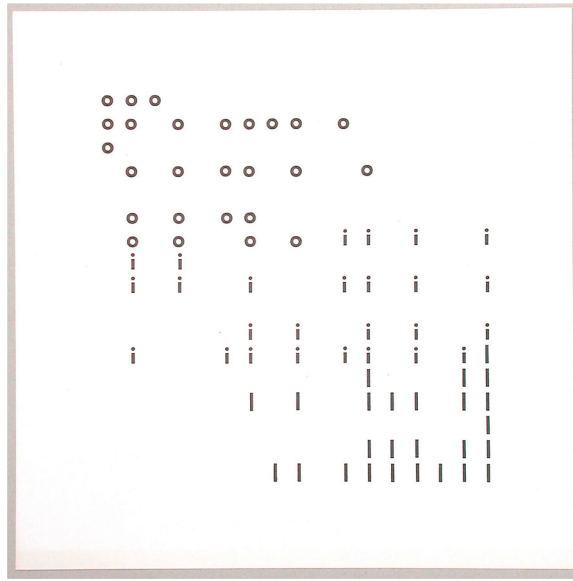
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<sup>1</sup>Hansjörg Mayer in conversation with author. September 2016.

<sup>2</sup>Poet & Polemicist: an interview with Jerome Rothenberg, 2013; accessible at: [www.raintaxi.com/poet-and-polemicist-an-interview-with-jerome-rothenberg/](http://www.raintaxi.com/poet-and-polemicist-an-interview-with-jerome-rothenberg/).

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**Figure 1.** *oil*. Hansjörg Mayer, letterpress. 1965.

living in Germany or working with the German language. Founder of the Frankfurt School, Theodore Adorno speculated whether poetry should still be written in the face of the barbaric (1949). Paul Celan, a Rumanian born poet whose parents were killed in the Holocaust, decided to continue writing in the German language, until death by suicide in Paris in 1970. He outlined his post-war position in a speech accepting the Bremen Literary Prize, in 1959.<sup>3</sup>

Only one thing remained close and reachable amid all losses: language. Yes, language. In spite of everything, it remained unlost. But it had to go through its own lack of answers, through terrifying silence, through the thousand darknesses of murderous speech. It went through and gave no words for what had happened; but it went through this event. It went through and could resurface, 'enriched' by it all. In this language I tried, during those years and the years after, to write poems: in order to speak, to orientate myself, to find where I was, where things were going, to sketch for myself a reality.

It meant, as you see, something happening, movement, being under way, it was an attempt to find direction . . . . (Celan 1986; Fynsk 1994)

As the darkness of the 1940s proceeded into the drive for political and economic reconstruction of the early 1950s, leading figures internationally within the arts and humanities maintained a process of profound questioning. Many struggled to work out their direction, wrestling with important questions of human agency in the face of a growing scientific positivism.

New fields such as cybernetics and information science, that played an important role in the conclusion of the war, required new understanding, calling for trans-disciplinary discourses, such as those activated within the 10 Macy conferences in the United States

<sup>3</sup>This translation of Célan's speech is a modification by Christopher Fynsk of an earlier translation (see citation in references).

between 1946 and 1953.<sup>4</sup> In a series of lectures, Martin Heidegger (whose name became for many irreparably tainted by his failure to speak out directly against the Nazi regime in Germany) speculated on language, poetry, technology and thinking (in a destitute time). Having fled to Brazil from war-torn Czechoslovakia, media philosopher Vilém Flusser consistently warned of the perils of mechanized thought and automated systems in relation to their neutralizing effect on human ethics and individual responsibility (1999). Throughout the 1940s, meetings of the Moral Sciences Club at King's College, University of Cambridge, brought leading philosophers Ludwig Wittgenstein, Karl Popper, G.E. Moore, Bertrand Russell and others together for intense arguments about the significance of language and the transcendence, or otherwise, of philosophy (Edmonds and Eidinow 2001).

In turn, the work of poets at the leading edges of avant-garde practices in post-war Europe combined new techniques of composition with destabilization of poetic form. Processes of linguistic decomposition came fully to the fore. In Paris, Isidore Isou and Maurice Lemaître, defining themselves as *lettrists*, built on earlier Dadaist experiments (Kac 1991) and sought to reinforce and reinvent the basic elements of language – focussing on the sound and the letter – shamanically casting off the word as if to invent new affordances, to renew language at its roots, to make a tabula rasa.<sup>5</sup>

### Lines to constellations

Swiss poet and theorist Eugen Gomringer played an important role with respect to this experimentation. His manifesto *From Line to Constellation*, written first in German in 1954, was published by Max Bense in his journal *Augenblick*.<sup>6</sup> It was first translated into English by Michael Weaver and published in *IMAGE*, a magazine edited by Philip Steadman in Cambridge (1964). The translation included the lines:

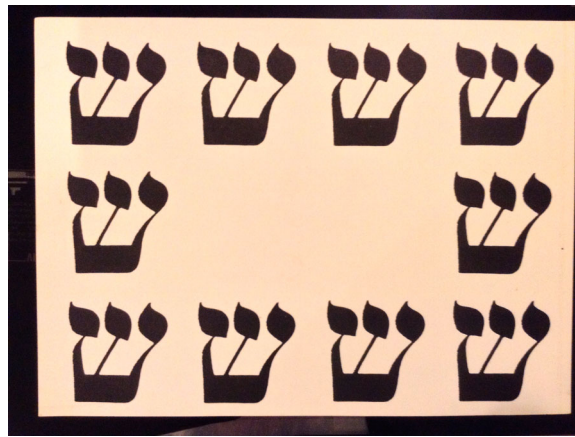
... The constellation is the simplest possible kind of configuration in poetry which has for its basic unit the word, it encloses a group of words as if it were drawing stars together to form a cluster. The constellation is an arrangement, and at the same time a play-area of fixed dimensions. The constellation is ordered by the poet. He determines the play-area, the field or force and suggests its possibilities. The reader, the new reader, grasps the idea of play, and joins in. In the constellation something is brought into the world. It is a reality in itself and not a poem about something or other. The constellation is an invitation.

Gomringer's original text had stated its debt to Stéphane Mallarmé's *Un Coup de Dés Jamais N'Abolira le Hasard*, written in 1896 (Lyon 1983). The words UNE CONSTELLATION had been spelt out in capitals by Mallarmé within his poem. Quentin Mellassoux has argued that Mallarmé's poem was based on a numerological play with the number seven (Mellassoux 2012). Whilst this theory remains in question, the poem was certainly a turning point between nineteenth-century symbolism and twentieth-century serialism and foundational in relation to the spatialist turn in the poetics of the next century (Ferran 2016). Reviewing Marshall McLuhan's *The Gutenberg Galaxy: The Making of*

<sup>4</sup>Macy conferences: further information about these is accessible at: <http://www.asc-cybernetics.org/foundations/history2.htm#MacyPeople>.

<sup>5</sup>Orson Welles interviewed Maurice Lemaître and Isidore Isou in 1955 for the St. Germain part of his *Around the World with Orson Welles* documentary; <https://www.youtube.com/watch?v=uZayMaC4RLo> (accessed 12 December 2016): see also <http://www.mauricelemaître.org/~pfs/what-is-lettrism/> (accessed 12 December 2016).

<sup>6</sup>*Augenblick* was a journal for aesthetics, philosophy and polemics published between 1954 and 1961, edited by Max Bense.



**Figure 2.** *Silencio* Eugen Gomringer. Hebrew characters, trans. Harry Warschauer. Openings Press 16.

*Typographical Man* (1962) for *Encounter* magazine, Frank Kermode described *Un Coup de Des* as ‘the first poem to take full account of the invention of printing’ (Kermode 1963).

Gomringer’s use of graphic space in his own poetry was also formative: one of his best known works, *Silencio*, made in 1952, had a single white space at the centre: like a muted nucleus around the poem was constructed. Steve McCaffery has recently argued that the historical and political context of its making within a decade of the concentration camps has often been underestimated (2013). In the mid-1960s John Furnival’s *Openings Press* in Gloucestershire, England published another version of the poem with the sign for the Hebrew sound for *sh* repeated 10 times around the void at its centre (Figure 2).

### Space and time continuum

A major sensitivity among poets, writers, film-makers and visual artists from the mid-1950s to late 1960s was a preoccupation with the idea of a space-time continuum; this was imaginatively explored in various works of art in many media. This took place against a backdrop of the Space Race, when the idea of freeing the human from the earth and from gravity was growing nearer to realization, during the first years when satellites were circling the earth, a monkey was set forth into outer space and many poets simultaneously were seeking to set words free from the meshes of rhythm and meter.

The alphabet, the basis of written and spoken language in Western civilization, became a primary force and site for experimentation: its letters were disassembled, fragmented, grafted, reassembled and scattered in acts of phonetic and typographic experimentation. Performed and visual acts broke the alphabet down into bits and fragments and/or reconstructed it again to become super-signs and icons. As these decades progressed, print, tape and type machines became collaborators in the action. The poetic form itself became the object of attention, undergoing numerous acts of naming and renaming.

### From information to the program

One of the primary theorists of these questions working in Europe in the 1950s whose work had significant impact on poets elsewhere, including in Britain, was Max Bense, a

Stuttgart-based mathematician and philosopher. Bense's theories combined ideas relating to semiotics (after C. S. Peirce<sup>7</sup>) and informational theory (after Norbert Wiener<sup>8</sup>). His pre-Second World War research into mathematics and aesthetics continued afterwards whilst his expertise in mathematics and philosophy infused the experimentation which his publishing, teaching and exhibition activities facilitated. Having taught at Ulm School of Design from 1954–1958 he then set up the Studiengenerale course at the Technischen Hochschule in Stuttgart. There he fostered an extraordinary range of experiments related to the stochastic and algorithmic properties of language and pioneered thinking around the idea of information aesthetics. He invited writers, mathematicians and others to events at the Studiengalerie around which a seminal network formed, with experiments with the form of the poem and poetic language closely embedded in this. On a large Zuse mainframe computer at the Technischen Hochschule in Stuttgart what is regarded as the first computer poem was created by Theo Lutz in 1959. He was a student of Bense who had suggested to him that he might use a random number generator to see what might happen. Lutz wrote up this experiment as the article *Stochastic Texts* published in *Augenblick* (1959). This work brought into the foreground underlying questions rippling below the surface of much poetic experimentation of the 1950s relating to the diminishing position of the singular auteur. What kind of poetry might be written by and with a machine?

Bense's work was exceedingly important in combining a strong theoretical framework with intensive experimentation. Frieder Nake, then a mathematician in Stuttgart, who started to make artwork with early computers, has described how the word 'program' was being investigated, shaped and tested in the Stuttgart context.<sup>9</sup> Now generically and generally applied to the language of computing, it was then only beginning to have traction. Along with *Augenblick*, Bense co-edited a series of small books called *rot*<sup>10</sup> (Figure 3).

Both provided space for circulation and cross-fertilization of theories and practice linking poetry, semiotics and theories of information aesthetics. Such dynamic interplay between theory and practice, research and dissemination was deeply radical. Bense's text *projekte generativer asthetik* published in *rot* 19 (Bense and Walther 1965) coincided with an exhibition of computer-based art work by Georg Nees at the Studiengalerie in February 1965. Within this Bense advanced the idea of generative aesthetics building on the notion of generative grammar, developed by Chomsky (1957, 1965).

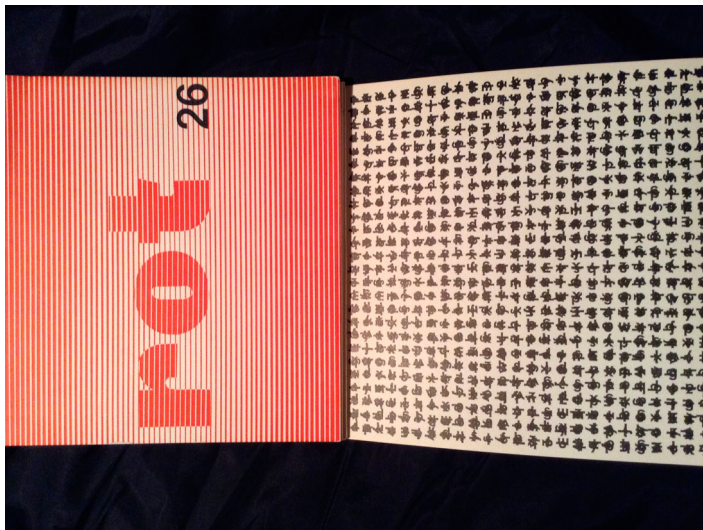
Bense's influence first found its way to Britain through inclusion of his journals in the *First International Exhibition of Concrete Kinetic and Phonic Poetry* held at Cambridge University in late 1964. This was organized by Michael Weaver, a postgraduate researcher in English Literature based at Magdalen College. He was aided by Reg Gadney (co-editor of *Granta* who included the exhibition catalogue as a supplement) and Philip Steadman, who had recently graduated in Architecture and beginning post-graduate studies. Stephen Bann, then based in Paris, helped to find works for inclusion in the exhibition and returned to Cambridge for the opening. It was to Bann that Pedro Xisto, one of the Brazil based

<sup>7</sup>Charles Stuart Peirce (1839–1914) was a logician, pragmatist and founder of semiotics or the science of signs.

<sup>8</sup>Norbert Wiener (1894–1964) was Professor of Maths at MIT and founder of cybernetics. He wrote *Cybernetics: Or Control and Communication in the Animal and the Machine* in 1948.

<sup>9</sup>Said by Nake in conversation with author. May 2015.

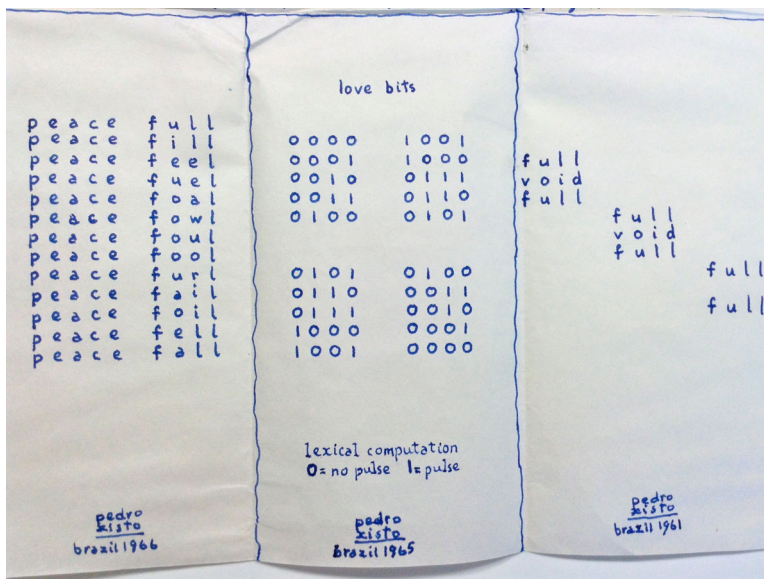
<sup>10</sup>The *rot* series of small books was co-edited by Bense and his second wife, Elisabeth. They published 52 titles including a work by Haroldo de Campos translated by Flusser. On the back of each book was this line: es gibt auch rote geheimnisse in der welt ja nur rote (Ernst Bloch).



**Figure 3.** rot 26. *alphabetenquadrate*. Hansjörg Mayer, letterpress. 1966.

concrete poets included in this first exhibition, and an advocate of Zen Buddhism, sent the manuscript poem below a few years later. (Figure 4).

*IMAGE* offered an extraordinary platform in 1964–1965 for circulation of ideas, theories, primary documents and translations relating to concrete, kinetic and visual poetry. A relatively glossy and colourful magazine for the period, it was changing ownership when Steadman became editor. It had started as a photojournalistic magazine modelling itself on *Paris Match* and Steadman, a self-taught, talented, graphic designer, got



**Figure 4.** Manuscript poems by Pedro Xisto, enclosed in letter to Stephen Bann. 1967. Reprinted with permission of Stephen Bann and the Xisto family.

involved initially as an assistant editor; this allowed him to migrate during a transition of ownership to the editorship and, along with Bann, Gadney and Weaver – to ‘hijack’ it for experimental purposes in true avant-garde fashion. The three issues dedicated to aspects of kinetic and concrete art and poetry produced between 1964 and 1965 are now collectors’ items. Combining theory and practical analysis, they offered extremely important insights into then emerging avant-garde practices. But the new owner hoped to make it a careers advertising journal. The November edition about Parisian kinetic artists had also an ad for a career in the Royal Air Force on the back and one for the Women’s Royal Army Corps on its inside front cover. One could conclude that reading supplementary features on new forms of radar used by the British Aircraft Corporation, etc. might help students decide to go for the arts or sciences. But the experiment ended after three issues as Steadman has recalled recalled: ‘I suspect we then crashed it with the absurd combination of avant-garde art contents and careers advertising’.<sup>11</sup>

The November 1964 issue also had a translation of an article by Pierre Garnier, a poet based in France, where he edited the review, *Les Lettres, Poesie Nouvelle*. This provided an important space for circulation and dissemination of perspectives internationally on where the new poetry was heading. In the text in *IMAGE*, Garnier stated his belief in the radical autonomy of language and his sense of the experimentation, taking place at its roots, as being equivalent to space exploration (1964):

Let it be understood once and for all that language is an autonomous part of the world, including the other universes, as it is included by them; hence its authenticity, and all the poets are aiming towards the ideal point where the verb creates itself.

:

These forms of poetry do not merely explore with the help of linguistic postulates fixed once and for all in the way the surrealists did, first they isolate the language, then they modify it, shuffle it in its very foundations, they even destroy it and thus create the conditions of apparition if not of a new language (therefore of a new thought and a new man) at least a new art which by disturbing the foundations of language modifies man. ... returning, without the obstacle of a language settled and compulsory, to the roots, the energies and working for it with the help of the most modern techniques, like the cosmonaut in space.

Garnier captured here one of the primary poetic impulses of the period, that is, to explore the ‘roots’, or the ‘movement of language within’ a phrase used by Ian Hamilton Finlay in a letter to Garnier from September 1963, also printed in the same issue of *IMAGE*. In this Finlay said:

I wonder if we are not all a little in the dark, still as to the real significance of ‘concrete’ ... . For myself I cannot derive from the poems I have written any ‘method’ which can be applied to the writing of the next poem; it comes back, after each poem, to a level of ‘being’ ... . Just so, ‘concrete’ began for me with the extraordinary (since wholly unexpected) sense that the syntax I had been using, the movement of language in me, at a physical level was no longer there ... so it had to be replaced with something else, with a syntax and movement that would be true of the new feeling (which existed in only the vaguest way, since I had, then, no form for it) ... .

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<sup>11</sup>Said by Philip Steadman, in conversation with author. January 2017.



This has echoes of Celan from his speech in Bremen about poetic language as ‘movement, you see, something happening, being en route, an attempt to find a direction ...’ (Klink 2000). Garnier had asked Finlay for his views on the benefits of theory within a context where experimentation in poetry was leading into spaces that were seemingly without boundaries or clear definition. Finlay’s response above conveys a phenomenological feeling of transition as well as resistance to overlaying any constructed theory. Nevertheless he did, in the end, agree to Garnier including his name in the list of those supporting his proposal to use the term *spatialist poetry* as a common heading for the following:

concrete poetry: working the language-matter freed from all representative duties

visual poetry: the word object and centre of energy

objective poetry: poem made object through the active collaboration of painters sculptors and musicians

mecaniste poetry: or poetry of permutations

phonic poetry: direct composition on a tape therefore an objectivation through mechanical means.

phonetic poetry: based on the phonemes, sonorous elements of the language uttered by the vocal organs of man and that are interpreted on the tape recorder.

Defining each of these in his own way, Garnier described these as ‘trends’, all of which involved ‘*objectivations of the language-universe*’. His text published in *IMAGE* also refers to poems as vibrations; earlier he, with his wife and partner in poetry, Ilse, had written of how they were ‘like waves, shooting about in the universe’.

Garnier’s ‘manifesto’ for spatialist poetry as a banner over all the other genres and sub-genres had been published earlier the same year in *Silâns*, a weekly magazine edited and produced by the artist Barry Flanagan at St Martins School of Art in London. Flanagan dedicated *Silâns* to ‘concrete poetry and its relations’. The text of the spatialist poetry manifesto reached his magazine via Henri Chopin, another French poet, who interestingly had told Garnier he would not sign the manifesto. However, the article in *Silâns*, headed INTERNATIONAL REVOLUTION IN MODERN LANGUAGES, is under his name, translated by Arlette Jackson. Chopin moved to live in England from 1965 and became a well-known figure in the network of relations around poets Bob Cobbing, dom Sylvester Houédard and many others in the experimental generation. Professor Jo Melvin at Chelsea College of Art reproduced *Silâns* in facsimile in 2011. In this she describes how Flanagan joined ‘a department with a strong interest in experimentation and enquiry’ and that the magazine ‘provided a vehicle to circulate concrete poetry within an art arena’. Flanagan managed to persuade the administrative staff to help with cyclostyling the copies. Sixteen issues were produced between October 1964 and June 1965. She cites John James, a poet and friend of Flanagan, on how ‘his circle of friends and associates’ reacted to receiving it every second Monday:

copies of *Silâns*

circulate from hand to hand among the poets

his influence & practice

touching and shaping the form of the work

a consequence a continuum

a writing outside literature. (Melvin 2011)

This idea of writing being *outside literature* is a very powerful one, reflecting the state of mind of many of those who were busily making experimental poems in visual, graphic and poetic form, for publication and exhibition in autonomous, self-organized, self-generated contexts, rather than following established routes or pursuing traditional outlets. This, if it was literature, was literature at a generative extreme.

## Poem as material

Traversing these extremes, was poet, typographer and publisher Hansjörg Mayer, who moved from Stuttgart to London in 1966 and began to teach typographic design at Bath Academy of Art in Corsham. Mayer's work was already combining typographic expertise at a very high level with alphabetical, mathematical and aleatory processes, so evolving concrete poetry into highly original territories.

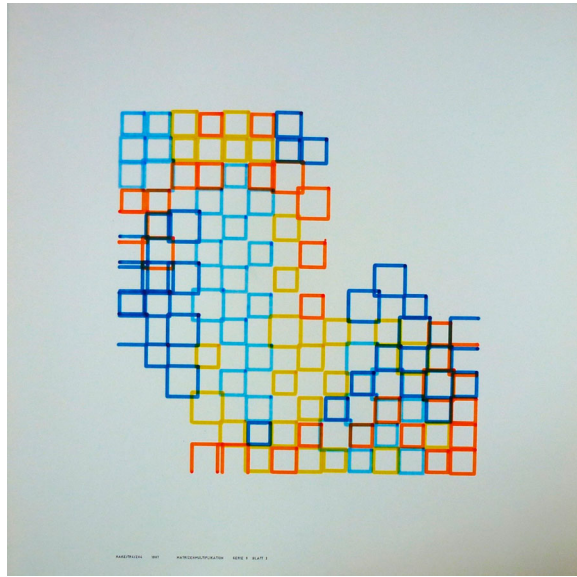
He became a significant crossover figure, traversing developments in England and in Germany and between graphic design and concrete poetry. His work reflected aspects of the controlled information aesthetics of Bense (which he had imbibed when studying informally with him at the Technische Hochschule in the late 1950s and early 1960s) and an experimental poetics that he pioneered on his own, combining exemplary fluency in typography with chance and random processes. Aged 22 in 1965, at Bense's Studiengalerie, he was given his first solo exhibition. It was named *typoetry*, a term generated by Haroldo de Campos, a member of the Noigandres group in Sao Paulo who had met Mayer there in 1964 and who subsequently christened him a *typoet* and his work as *typophagous*. In his letter printed in the catalogue for the exhibition de Campos said of Mayer, 'he eats reality with type'.

Adept in creating works that explored the material interfaces between ink, language, paper and the machinery of print, much of Mayer's work can be seen in the lineage of construction and constructivism, with an inventive interplay between language of form and technical experimentation. Simultaneously he had shown an intense interest in deconstruction, decomposition and in the live space between the work and its making. This has contributed to positioning him uniquely in between what has been called 'clean' or purist concrete poetry and hybrid or 'dirty' intermedia forms associated with fluxus artists often using text and improvisatory performance. Among these was leading fluxist poet Emmett Williams, with whom Mayer worked closely on several publications that sit in the interface between poem and artists book (Ferran 2017).

Work by Décio Pignatari was also included in the Cambridge 1964 exhibition. He was a designer as well as a poet and had also met Mayer during his visit to Brazil at the end of 1964. In an article called *The Concrete Poets of Brazil* published in the *Times Literary Supplement* (TLC) (1964) Pignatari declared that the poet was also 'a language designer'. He also said 'the alphabet is a computer'.<sup>12</sup> In this he was conceptually close to Mayer who regards the language of computation and the language of poetry as closely related. Mayer's typoeical works often deployed mathematics where he would work within a

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<sup>12</sup>Information provided by former student of Pignatari in emailed correspondence with author. August 2016.



**Figure 5.** From *matrizen multiplakationen* Frieder Nake. Letterpress, computer plotter, program. Edition Hansjörg Mayer. 1967.

numerical constraint, usually linked to the number 26, the number of letters in the alphabet, or with subsets of 26. An early work from 1962–1963, 26 prints called *alphabet* have been much reproduced.

The radical conjunction of computation, typography and print was at the heart of a portfolio Mayer published under his *edition hansjörg mayer* imprint in 1967 with Frieder Nake. Mayer recognized that aleatory processes were at play in drawings made by the computer plotters used by Nake and so suggested they make a print portfolio together that would combine for the first time ever, letterpress typography, computer plotter drawings and a print out of a computer program. The end result was *matrizen multiplakationen*, the significance of which as an early meeting point between art, typography and computation has rarely been appreciated. At the time of writing it is on display at Tate Modern in London (Figure 5).

Mayer's imprint was an important publishing outlet for concrete and visual poetry and his use of the Futura typeface was influential on other poets who adopted it for the setting and design of their work. Stephen Bann, in his introduction to *Concrete Poetry: An International Anthology (London Magazine Editions 1967)*, referred to Mayer as having developed a *grammar* of Concrete Poetry, bringing into clearest prominence the elements with which the poet must work. Mayer himself has spoken of Futura's uniqueness as a typeface pared to a modernist minimum, constructed of only line and circle. A related series of poem prints called *futura* were published between 1965 and 1968 featuring 26 works by various artists. Nake's *futura* was called *computer grafik*. Scottish poet, Edwin Morgan, made a work for the series called *emergent poems*. Mayer also worked on a poem print with Xisto, entirely composed of lines and circles, published as part of the *13 visuelle texte* portfolio (1964)<sup>13</sup> (Figure 6).

<sup>13</sup>This work by Xisto will be on display in Spring 2017 at the Getty Institute in Los Angeles along with two other pieces from the *13 visuelle texte* portfolio.

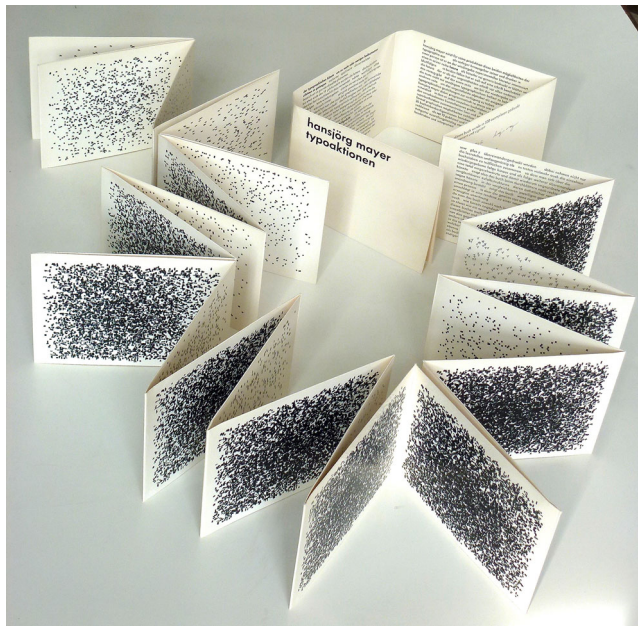


**Figure 6.** Pedro Xisto Print from *13 visuelle texte* portfolio Edition Hansjörg Mayer, 1964.

Mayer made his condition of employment at Bath Academy of Art the purchase by its Directors, Clifford and Rosemary Ellis, of a new large proof press as well as the Futura typeface. Using this, he developed and published the third of his concrete poetry portfolios which innovatively scaled up the size of paper used for production of poems to wall poster size. He encouraged a group of graphic design students to work together with a collection of concrete and visual poets from Britain, Canada and the United States to typeset letterpress versions of poems into one 'edition' (now held by Tate as part of their Mayer collection). Poets contributing to this from the UK were Stephen Bann, Thomas A. Clark, Bob Cobbing, Ian Hamilton Finlay, John Furnival, dom Sylvester Houédard, Cavin McCarthy, Edwin Morgan and John Sharkey. An introductory text was written by Jasia Reichardt.

The work of both Bense and Mayer was included in Reichardt's exhibition *Between Poetry and Painting* held at the ICA in the autumn of 1965 which included lettrist works as well as concrete, semiotic, sound, spatialist and visual poetry. Reichardt invited dom Sylvester Houédard, a Benedictine monk and poet who produced work mainly on an Olivetti typewriter, to contribute an overview text for the catalogue. In the end this was a separate insert. Houédard had attempted the difficult task of a *Between Poetry and Painting* chronology. In this he stressed the primary influence of communication theory.

The work of both Bense and Mayer was referenced in the second of the two special features of the *TLS* published in London in 1964 focussing on literary avant-gardes internationally. Edited by John Willett and extremely wide-ranging in scope, *Any Advance the Changing Guard 2* showed intersections and correspondences between concrete and



**Figure 7.** *typoaaktionen*. Hansjörg Mayer. Letterpress, Leporello Binding, 1967.

visual poetry with ideas from semiotics and emerging information theory. Willett made reference to the ‘text topology’ ‘word-counts’ and ‘text algebra’ of Bense and mentioned books by Diter Rot, with whom Mayer later worked very closely. He gave these as examples of those who were challenging the limitations of linear prose and aiming at a new synthesis between the literary and the visual.

In 1967 a work by Mayer called *typoaaktionen* (Figure 7) was featured on the front page of the *TLS* with a caption acclaiming it as an example of ‘radical superimposition’. In 2016 *typoaaktionen* was installed alongside *random superposition of zeroes and ones*, a new work inspired by Mayer’s original, made by a Cambridge researcher, as part of art and nanoscience exhibition held at the Maxwell Building at the University of Cambridge.

In 1964 the first of the two *TLS* features on avant-garde literatures focussed on UK and US-based writers and poets, including Houédard, who was also singularly interested in connections between computational language and poetry. He was the first in England to give lectures about concrete poetry and links to machines. His own works often called *typestracts* were usually produced on his typewriter in the small cell in the Abbey where he lived in Gloucestershire. He recognized that the movement (—the ‘turns’—) that kinetic poetry offered was a further step into a post-authorial void that Mallarmé had first signalled and that computers in potential offered a chance to take further. A prolific letter writer, he was often invited to provide introductory texts for concrete poetry festival catalogues that he wrote in characteristically hyper-textual, inventive language presciently with respect to the reductionist language now of texting and twitter.

Prompted by being published in the same issue of the *TLS*, Houédard wrote a letter to Margaret Masterman who had founded the Computer Language Research Unit in Cambridge several years earlier (Houédard 1966). His letter was subsequently published in the first issue of a new journal called *Theoria to Theory*, closely connected both to the

Language Research Unit and a group called the Epiphany Philosophers, that Masterman was part of, operating from the same address in Cambridge. Published under the heading – *Poetry Theory and Poetry Theoria*, his letter stated:

... I find all this area still unsatisfactorily mapped in british philosophy ... I mean ... if language is THERE to use ok ... but the need for new words is w/us all the time ... they don't come by analysis ... we can take the words & nonwords quark and antiquark & use them and make means things abt elementary properties ... but I'm thinking about a deeper problem (I think) abt the originating of language and communicating signs ... or does one just have to depend on the given & enlarge it?

Masterman had studied philosophy with Wittgenstein and with colleagues in the CLRU made a pioneering contribution to experimentation within the then emerging field of natural and machine language processing. In his letter Houédard also referred to the challenges of: '... getting machines to write tolerable conceptual and semantic associations & language models &c'. linking this to his experiments at the time in making in kinetic poetry with poets Kenelm Cox, John Furnival and Richard Loncraine:

... our own contribution ... here in the Cotswolds (furnival loncraine cox myself) has been (... ) towards the possibility (via kinetic poetry) of machine semiotic poems in which NO lexical key is provided any more than when nice/nasty/white/&c clouds passes across ?yr sky (have the glosteshire group ('gloop') poets here produced art? Poems? Or a language? ... or is it that the poet constructs the MACHINE ... ie the machine IS the poem? ... (cf pierre albertbirot on the POET as the poem machine in grabinoulor).

Houédard also wrote a letter to Hansjörg Mayer shortly after meeting him at the *Between Poetry and Painting* exhibition opening. In this he told him about the Cambridge Language Research Project recommending that he make contact with them as they seemed to be the closest equivalent in England to what Bense was doing in Germany.

*Cybernetic Serendipity*, acknowledged by many to be the first major exhibition in the world of computer art, was organized at the ICA in London by Jasia Reichardt, in 1968. Reichardt recalled in the catalogue introduction that she had been inspired to do the exhibition by Max Bense when they met at the opening of *Between Poetry and Painting* at the ICA three years earlier. The exhibited works included *Computerised Haiku* which Margaret Masterman made in collaboration with Robin McKinnon-Wood, who was a founder of another pioneering organization called Systems Research Ltd. In a text published in *Theoria to Theory*, McKinnon-Wood and Masterman gave an extended account of their hypothesis and experiments (1967).

(ii) Algorithms (mechanical tricks) can also be used to produce a fully computerized poem. For instance, in the output given immediately below the machine has been (a) only to chose words beginning with the letter 's' and, (b) when there is a choice among 'S' words, to take the one whose second letter is nearest the end of the alphabet (and so recursively, if there is still a choice of words).

⋮

The fact that some of these algorithms of tricks produce quite good output highlights the known fact that traditional poetry also uses tricks of rhythm, rhyme and alliteration to allow words to combine more freely (because more mechanistically) than would be permitted by the stereotypy of prose.

## VII. The role of the poet in computer poetry

It will be evident from the above that the poet programming a computer must: (i) set up the frame, (ii) create the thesaurus, (iii) devise any mechanical tricks (e.g. rhyming) with which he may desire to operate. ... He can, of course, be vastly more sophisticated than we have in setting up and varying his frame (a sonnet, for instance, is a sophisticated frame). But the ultimate creative act, for the computer poet, lies in writing the thesaurus.

They end with a statement of differences between the concrete and the computer poet:

From the above it would provisionally appear that, whereas part of the motivation of the genuine concrete poet is to stream-line his own mind, so as to make his poem into something as like an algorithmically produced machine output as possible, the computer-poet on the contrary, tends to use the machine to create a profusion of new, surprising and unforeseen combinations of words which, without its help, he would not have thought of.

The editorial direction of *Theoria to Theory* was closely entwined with the interests of the Computer Language Research Unit and The Epiphany Philosophers, who were primarily interested in connections between religion and science. Early covers of the journal resembled visual poems (see [Figure 8](#)). In a text by Robin McKinnon-Wood called *Computer Programming for the Literary Laymen* (1967) he outlined some of the primary challenges facing anyone wishing to work with computer technology effectively in the mid-1960s. From his list he selected language as the most interesting problem and described how:

the first real development of computer languages came about when it was realised that the logic formerly embedded in a plug board by a set of physical wires could be stored in the machine's own store. From this there developed the concept of pure machine code. This is a code which on the very early machines was written directly in binary notation, that is using only noughts and ones, and this was stored in the store of the machine ...

He then outlined the introduction of punch-cards that meant there was now *a written language*, efficient for the machine but drudgery for the person writing it onto to the (then) recent stage of development – of writing assembly languages. He described this brilliantly:

An assembly language is a language in which each statement written corresponds directly with some binary code inside the machine; that is, some instruction which the machine can carry out and which it will obey whenever it is reached. In this sort of language, at least some of the characteristics of a human being are taken into consideration. For example, human beings like to write in symbols, such as sets of alphabetic characters, which can represent larger concepts than those possible in binary notation.

He then continued, explaining the limitations of assembly languages and why he and his colleagues were working on higher level programming languages to try to resemble natural languages, a challenge that is still current in the twenty-first century.<sup>14</sup>

From 1968 onwards computers began to be viewed in art as potential ideation tools, capable of process generation and not just as calculating machines. The computer artist and scientist Ernest Edmonds has written of his move between 1967 and 1968 from

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<sup>14</sup>See Economist magazine, Technology Quarterly. 7<sup>th</sup> January 2017: 'Finding a Voice' on how computers "still don't understand the meaning of language.





## Notes on contributor

**Bronac Ferran** is a curator, writer and doctoral researcher working on Hansjörg Mayer and the ‘typoetical revolution’ of the 1960s, exploring connections between code, design, language and poetry. Formerly Director of Interdisciplinary Arts, Arts Council England and Senior Tutor, Research, Innovation Design Engineering at the Royal College of Art, she has curated exhibitions about concrete and visual poetry, design and software-based art in Cambridge, Glasgow and London. She has written the first monograph about Hansjörg Mayer’s work, *The Smell of Ink and Soil: The Story of (Edition) Hansjörg Mayer* (König Books, March 2017). She guest co-edited this issue of ISR journal with Elizabeth Fisher.

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