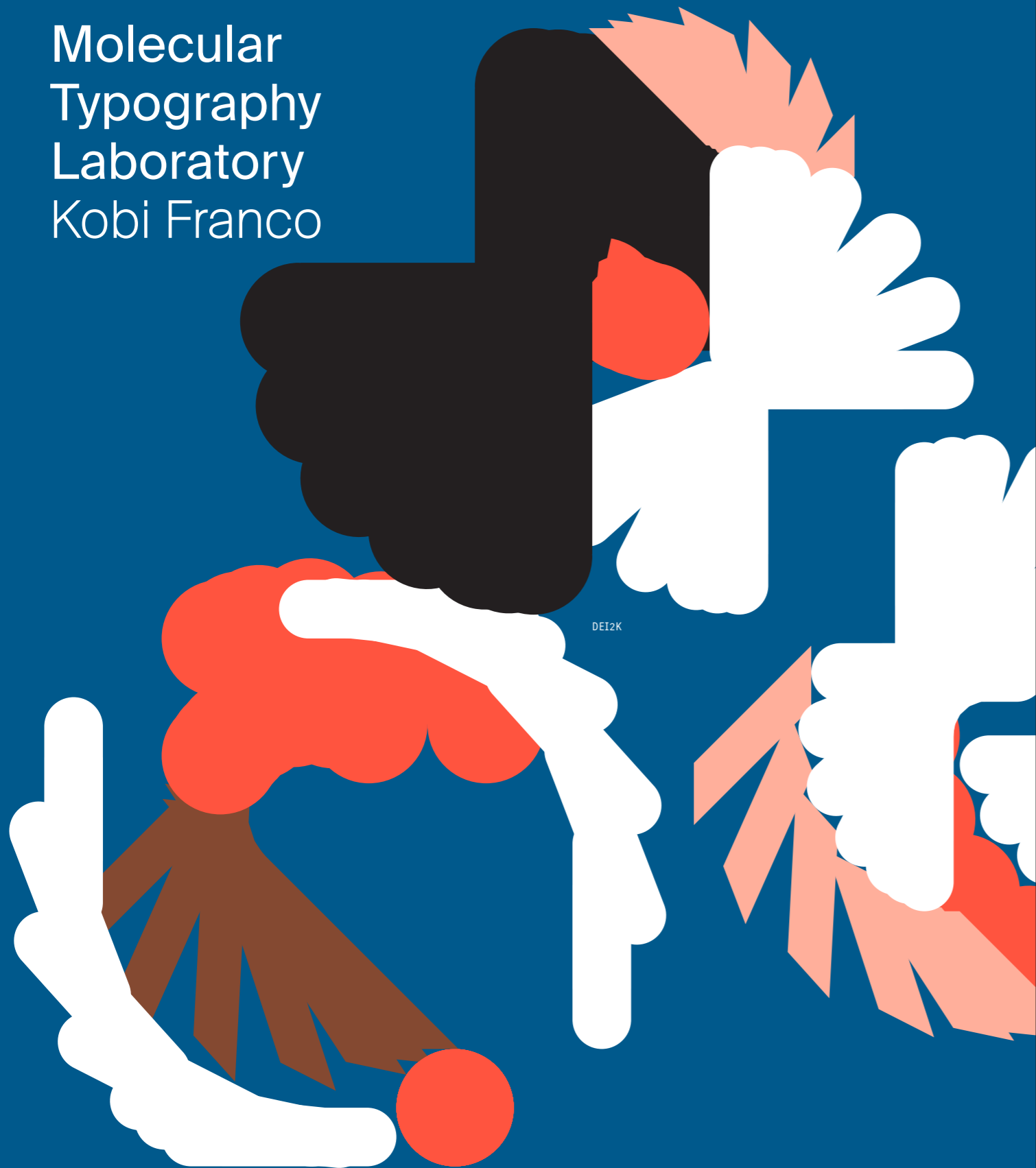


Molecular Typography Laboratory Kobi Franco



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Molecular Typography Laboratory Kobi Franco

The *Molecular Typography Laboratory* is a speculative research project that explores experimental typography along the axes of function versus aesthetics and content versus form. It includes a series of tests that examine the use of molecular typography – a system of “games” for which I determine the rules, set the game board and decide on the players. The tests present the results of each game.

I first encountered the combination “molecular typography” while randomly surfing the Internet. The search led to a short video titled *Understanding Molecular Typography*,¹ which documented a lecture by the American designer and artist Woody Leslie. Leslie surveyed a book by this name published in 1992, which he attributed to the philologist and scholar H.F. Henderson. Henderson’s book pursues a scholarly argument dating back to the mid-20th century, according to which the Latin alphabet is composed of atomic units, so that each sign is composed of a combination of several atoms. Henderson identified seven such

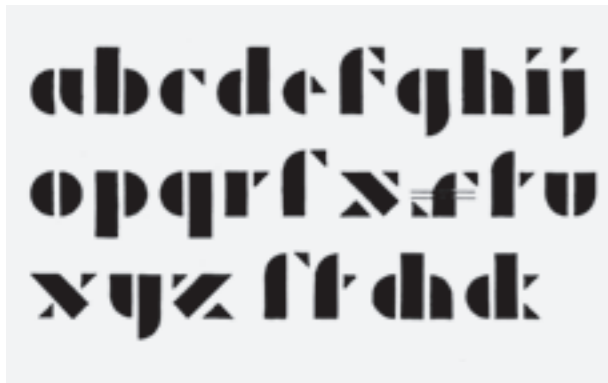
atoms, while assuming that future research in other languages would yield additional atoms or new insights.

The “study” and the “book”² were both revealed to be an artistic project, a figment of Leslie’s imagination. Nevertheless, I became enchanted with the speculative process of thinking about a Hebrew alphabet composed of similar yet different “atoms.” I decided to embark on a journey – an experimental, pseudo-scientific study, based on the assumption that the Hebrew letters indeed had a molecular structure. I sought to examine how this assumption could be applied to the Hebrew alphabet, to Hebrew words and to the Hebrew language. I conducted more than 150 different tests, which crystallized over time into 11 main themes: foundations, language, gender, formula, weight, 3D, gravitation, generative research, color, word play, type and image.

The rhizomatic character of the study, which branched out as it expanded from one

¹ <https://www.youtube.com/watch?v=seM-sJcTh3w&app=desktop>

² H.F. Henderson, *Understanding Molecular Typography*, with a new introduction by Woody Leslie (New York: Ugly Duckling Press, 2019).



1 Josef Albers, *Schablonenschrift* (Stencil script), 1926



2 Jeffery Keedy, *NeoTheo*, 1989

test to the next, enabled me to leap from one theme to another, employing a strategy that could continue operating as long as I was interested in pursuing it.

Typography: A Historical Perspective
 “If writing is but a copy of spoken language,” argue Ellen Lupton and J. Abbott Miller, “typography is a mode of representation even farther removed from the primal source of meaning in the mind of the author. The alphabet, in principal, represents the sounds of speech by reducing them to a finite set of repeatable marks; typography is but one of the media through which this repetition occurs. The letter a might be carved in stone, written in pencil, or printed from an engraved block, but only the last is, properly speaking, typographic.”³ Typography first emerged with Gutenberg’s invention of

3 Ellen Lupton and J. Abbott Miller, “Deconstruction and Graphic Design,” *Design Writing Research: Writing on Graphic Design* (New York: Princeton Architectural Press, 1996), p. 5.



3 Zuzana Licko, *Variex*, 1988



4 Max Kisman, *ZwartVet*, 1988

the printing press in the 15th century, enabling hand-written manuscripts to be replaced by serial production. It enabled the formation of each text in an industrial process so that it could be reproduced and circulated, introducing not only the arrangement of letters on lead plates, but also punctuation and spacing.

In the 16th century, the Italian Humanists cast typefaces based on ancient Roman letters. They sought to design each letter on the basis of a geometric, scientific grid, which would reflect the ideal measurements of the human body and the golden triangle, based on the assumption that such precisely measured letters partook of an absolute moral order. In the 19th century, the allegiance to classical norms was replaced by a quest for innovation and the commercial design of countless typefaces. Modern typography underscored the systemic character of writing and typefaces, and the alphabet came to be viewed as a genetic code giving rise to numerous variations. In the early 20th century, letters began to be assembled into wide-ranging “typeface

families,” which included different variations linked by a genetic connection, such as book, bold, italic, narrow, and many more. This system is still prevalent today.⁴

In the 1920s, letter design preoccupied a number of prominent artists and designers. Typefaces such as *Schablonenschrift* (Stencil script) by Josef Albers,^{fig. 1} *Universal* by Herbert Bayer, and *Het Vlas* by Bart van der Leck were designed in an attempt to do away with the “individuality” of the letter, while underscoring the grid and the method, and often compromising legibility in favor of “egalitarian and democratic” design based on the principles of modern industry.

The modern avant-garde movements De Stijl, Dada, Futurism, Constructivism and Bauhaus created typographical imagery that challenged legibility, imposing on readers the task of seeing the image, word and text in a new light. Each of these movements catalyzed innovative typographical experiments that overturned the appearance of written signs, whether by undermining the linear structure of the text, or by overturning conventions of printing and habits of reading and writing. Some searched for the universal skeleton of letters; others examined the line separating abstract form from written sign, as later encapsulated by the philosophy of Jacques Derrida, who noted that a form or function are organized according to an inner logic, whose components only have meaning in terms of their mutual connection or disconnection.⁵

4 See Ellen Lupton and J. Abbott Miller, “Laws of the Letter,” *Design Writing Research: Writing on Graphic Design* (New York: Princeton Architectural Press, 1996), pp. 53–61.

5 Lupton and Miller, “Laws of the Letter,” p. 58.

By contrast, neo-modern designers sought formal inspiration in the technological, digital environment of the post-industrial world, far from the democratic idea of equality and liberty.⁶ These designers pinpointed the avant-garde origins of their typefaces, including *New Alphabet* (1967, Wim Crouwel); *Emperor* and *Variex* (1985 and 1988, Zuzana Licko); *NeoTheo* (1989, Jeffery Keedy); and *ZwartVet* (1988, Max Kisman).^{figs. 2–4}

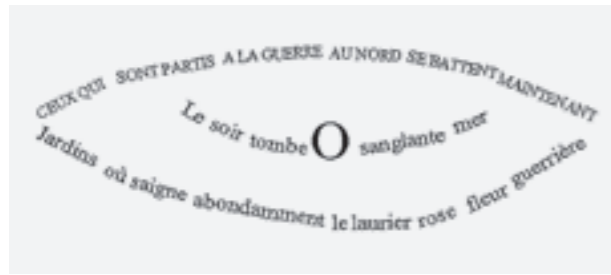
Zuzana Licko and her partner Rudy VanderLans’s design hub, Emigre, played a pioneering role in combining neo-modern design in design programs developed for Macintosh computers in the early 1980s. These typefaces replaced the streamlined, mechanical approach with a new model that combined biology and technology, paving the road for the early 21st century’s generative revolution in typeface design.⁷

Laboratory: Letter as Research Subject
 Walter Benjamin makes reference to Stéphane Mallarmé as the first poet who gave expression to the tension between letters arranged horizontally in a book, and the vertical letters appearing in advertising posters.⁸ In his poem “A Throw of Dice Will Never Abolish Chance” (1897), Mallarmé devoted much thought to the support offered by the page and to the unusual layout of the text, while treating the visual unit as a double rather than a single, on which the text is read from top to bottom, while the lines traverse the page from left to right. This

6 Ibid., p. 59.

7 Ibid., p. 61.

8 Walter Benjamin, *Selected Writings*, Vol. 1, 1913–1926 (Cambridge, MA: Harvard University Press, 1996), p. 456. See: Shir Cholev, “The Advertising Poster: Both Painting and Poem,” in *Bezael Journal of Visual and Material Culture* (issue 6), *Design: Art of the Everyday* (January 2020), in Hebrew.



5 Guillaume Apollinaire, pages from *Calligrammes: Poèmes de la paix et de la guerre* (Calligrams: Poems of Peace and War), 1918

layout allowed for a new experience of reading, with the eye wandering in multiple directions through the space of the page. The text lacks punctuation and is marked by typographical variations, with changes in letters size and weight and the use of capital letters along lowercase ones.^{p. 60} Mallarmé's poem gave rise to a wide-ranging tradition of books that made expressive use of typography: Guillaume Apollinaire's *Calligrammes: Poems of Peace and War* (1918);^{fig. 5} Vladimir Mayakovsky's *For the Voice* (1923), designed by El Lissitzky;^{fig. 6} or Fortunato Depero's book *Depero Futurista* (1927), known also as "the screwed book," since it was bound with two industrial screws. The double character of the written sign continued to preoccupy poets, artists and thinkers throughout the second half of the 20th century, giving rise to what is known as "concrete poetry," which plays on typographical arrangements that contribute to the poem's meaning, and "visual poetry," which adds drawing and collage to typography.⁹

Jacques Derrida's philosophy deconstructs the central pairs of binary oppositions that have long dominated Western culture,

9 See: Gianfranco Crupi, "Mirabili visioni: From Movable Books to Movable Text," *JLIS.it*, 7:1 (2016), pp. 25-87.



6 Vladimir Mayakovsky, *For the Voice*, 1923, designed by El Lissitzky

including reality/representation, origin/copy, body/mind, and speech/writing. This process is undertaken by locating the negative, or lesser valued, among the two terms within the frame of the valued, positive term. In Western culture, writing was always considered a secondary copy, or derivative, of speech, which was seen as emanating directly from consciousness; it was hence considered an abstraction that severed language from its human origin. Deconstruction, by contrast, views writing as an active form of representation that is not merely a corrupt copy of the spoken word, but an idea that infiltrates thought and speech, instigating change in the spheres of memory, knowledge and intellect.¹⁰

Derrida's arguments overturn the above-quoted argument by Lupton and Miller – "If writing is but a copy of spoken language, typography is a mode of representation even farther removed from the primal source of meaning." For writing is replete with non-phonetic elements and functions – graphic markers that elude definition as "signs" since they represent no "signifieds." These include, for instance, various types of accents or the visual distinction between a regular typeface and an italic typeface, or between a capital and a lowercase letter. What is central to these non-phonetic marks is spacing, which indicates a negative gap between the positive signs of the alphabet. This spacing, according to Derrida, cannot be dismissed as a "simple tool" for writing. The alphabet relies on mute graphic servants such as spacing and punctuation, which are perceived as external to the content and the structure of the work, yet are vital for its creation and reception. Like non-phonetic additions to the alphabet, the margins around the text are a combination of image and ground, a positive element and a negative element.

Spacing and punctuation, borders and frames: this is the territory of typography and graphic design – those arts on the margins of writing that render texts and images legible, determining the shape of the letters, their style, spacing, and layout on the page. From its position on the margins of communication, typography further distances writing from speech, much like Derrida himself, whose use of the page departs from the familiar templates of academic publications by introducing different typefaces to denote different modes of writing and different voices.

10 See Lupton and Miller, "Deconstruction and Graphic Design."

In contrast to traditional literary and philological research, which ignores these graphic forms and focuses on the word as residing at the core of communication, a deconstructive study of typography and writing explores structures that make manifest the intrusion of the visual form and of ideas into the written content by means of signs, spaces and graphic characterizations. Spacing, framing, punctuation, choice of typeface, layout and other non-phonetic forms create the material interface of writing.

Molecule: The Speculative Letter

In his book *Understanding Molecular Typography*, Leslie speculates about future studies, which will examine molecular alphabets in different languages and catalyze a revolution in this field. In his opinion, one must first examine the number of atoms that make up each alphabet, after he himself deconstructed the Latin alphabet into seven atoms.¹¹ Leslie based his study on the *Futura* typeface (1927) designed by Paul Renner. In my laboratory, I chose to work with the typeface *Va'ad* (2005), which I developed based on a number of letters designed by Ze'ev Raban for a drawing featuring the facade of Tel Aviv and Jaffa's Beit Va'ad Hakehila (Community Committee House) (1925).^{p. 20}

The *Va'ad* typeface was deconstructed into six variously-sized atoms, designed on the basis of a square grid and tagged with the Latin letters D, E, I, J, K, V. The combinations of atoms that make up the letters of the molecular alphabet are arranged as if composing a chemical formula. Each atom is surrounded by a fixed electric charge that causes an electro-magnetic interaction. The combination of the atoms into

11 H.F. Henderson, *Understanding Molecular Typography*.



7 Zuzana Licko, *Lo-Res*, 1985

letters parallels the combination of letters into words. The atoms are three-dimensional units, whose combination forms letters or three-dimensional signs.^{pp. 204-209}

LETTERS AND LANGUAGE UNDER CONSTRAINT

Take a newspaper.

Take some scissors.

Choose from this paper an article of the length you want to make your poem.

Cut out the article.

Next carefully cut out each of the words that make up this article and put them all in a bag.

Shake gently.

Next take out each cutting one after the other.

Copy conscientiously in the order in which they left the bag.

The poem resembles you. And there are you – an infinitely original author of charming sensibility, even though unappreciated by the vulgar herd.¹²

This arbitrary strategy, in the spirit of the guidelines for writing a poem in Tristan Tzara's *Dadaist Manifesto*, resembles the self-imposed writing constraints formulated by the members of the group OuLiPo – a circle of mostly French writers, poets and mathematicians founded in 1960.¹³ The group's purpose was to create new literary structures and models by imposing various restraints or algorithms. Necessity is the mother of invention, or, in the words of group member Georges Perec, functions as "a machine for stories." Existing literary forms such as the lipogram or palindrome, as well as new forms invented by the group, were largely based on mathematical equations.¹⁴ The reliance on this type of constraint appeared at first to be a spectacular tool, yet in fact stemmed from the belief that linguistic constraints liberate consciousness and give rise to new and original ideas, defined by Amotz Giladi as "the paradox of the liberating constraint."¹⁵ My project has been deeply influenced by the creative activity of the OuLiPo group.

THE VISUAL LETTER

The use of linguistic templates such as the anagram, palindrome and panagram accelerates a form's capacity to add to verbal content, to camouflage it and to act as crude visual matter. My own tests have examined the formal, aesthetic and symmetrical appearance of letters and words, in the spirit of post-structuralist interpretation, which views the text as a weave of interrelated signs in an expanding

network of meanings. Derrida himself noted the etymological connection between text and texture, conceiving of a text whose materiality resembles that of a cloth. An additional argument made by Derrida, "There is no outside-text," underscores the materiality and bodily character of language. The text always exceeds its frame, which changes in accordance with different interpretations and encounters with textured weaves composed of other signs.^{pp. 84-115}

THE DIMENSIONAL LETTER

J. Abbott Miller details several manifestations of dimensional typography: extrusion, shadowing, rotation, tubing, the voluminous, molecular construction and modular construction.¹⁶ The molecular structure is composed of similar small-scale units, which together form a larger whole. The typefaces *Oakland* and *Emperor*, designed by Zuzana Licko and later unified as the typeface *Lo-Res*, are one example of using smaller units, or bitmaps, to compose each letter. The modular structure similarly constructs large forms out of small units, yet ones that are not necessarily identical.^{fig. 7} The modular principle has been studied throughout the history of letter design beginning in the early 20th century – for instance, as noted, in Bayer's *Universal* typeface and in Albers' *Schablonenschrift*, in which the Latin alphabet is composed of ten different modular forms. What they all have in common is the restriction of design templates and the limitation of the visual language to reproducible units. A more complex pattern is evident in the typeface *Fregio Mecano* (*caraterre scomponibile*) – Mechanical



8 Unknown designer, *Fregio Mecano*, 1920s

Ornament (decomposable typeface), created by an unknown Italian designer in the 1920s: a system of 20 different molecular forms – straight, rounded, angular and so forth, which together make up the Latin alphabet. The forms are placed on a vertical grid composed of four lines, and are each composed of a combination of one-four lines.^{fig. 8} The molecular alphabet that I created is composed of six basic forms designed on a square grid.^{p. 16}

THE GENERATIVE LETTER

In the late 1980s and early 1990s, a number of designers and computer programmers experimented with programming typefaces that change their form with each use.¹⁷

12 Tristan Tzara, "To Make a Dadaist Poem" [1920], *Seven Dada Manifestos and Lampisteries*, trans. Barbara Wright (New York: Riverrun Press, 1984), p. 39.

13 The group's name is an acronym for *Ouvroir de Littérature Potentielle* (Workshop of Potential

14 See the entry OuLiPo in Wikipedia. Literature).

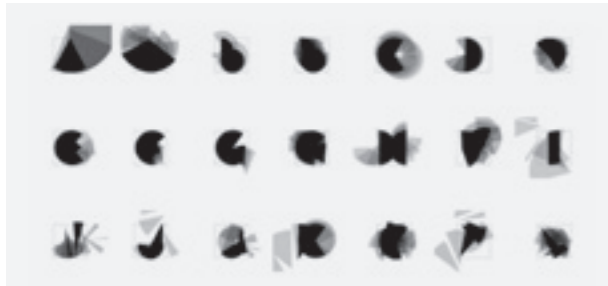
15 Amotz Giladi, "Getting Language to Speak," *Ho!* 3 (February 2006), p. 262, in Hebrew.

16 J. Abbott Miller, "Dimensional Typography," *The Graphic Design Reader* (London: Bloomsbury, 2019), pp. 369-379.

17 Jason E. Lewis and Bruno Nadeau, "Post PostScript Please," *Digital Creativity*, 21:1 (London: Routledge, 2010), pp. 18-29.



9 Tobias Frere-Jones, *Reactor*, 1993



10 Peter Cho, *Type Me, Type Me Not*, 1998

Erik van Blokland and Just van Rossum's typeface *Beowulf* (1990) is one example of a randomly created typeface, whose edges change each time the letter is printed. This groundbreaking typeface made use of digital technology as a means of introducing a dimension of chance and uncertainty into the immutable world of typography, offering a glimpse of what the future holds for us.¹⁸

Additional examples include the typeface *Reactor* (1993), created by Tobias Frere-Jones for Neville Brody's experimental design magazine *Fuse*, in which the typing of each new sign creates some visual "noise" in the previously typed signs;^{fig. 9} or the typeface *Type Me, Type Me Not* (1998) developed by Peter Cho at MIT's media lab, which creates an interactive-animated transition between each letter and the following one, thus endowing the writing of a text with a dynamic appearance.^{fig. 10} The letters are based on a circular form, and the

animative transition employs the circle as a genetic characteristic embedded in the typeface's visual DNA.¹⁹

My laboratory experiments explored two generative directions, in three dimensions and in two dimensions. As noted, every letter in the Latin molecular alphabet is composed of combinations including two–eleven atoms, which are arranged as a chemical formula, with a digital catalyst developed in the laboratory creating different three-dimensional variations for the formula pertaining to each letter of the alphabet. Since the number of combinations in each formula is, in principle, infinite, I decided to limit the combinations of atoms by determining a specific width and height for each letter, so that these limits are not exceeded. The result is a generative system of letters characterized by the identical characteristics of a visual DNA.^{pp. 34–38} The catalyst also enables a perspectival, three-dimensional view of each letter and of different combinations derived from the formula.^{pp. 154–157}

The two-dimensional tests gave rise to a system that independently rotates the atoms composing each letter. The rotations were examined according to three parameters: the angle of rotation, its centering, and the number of repetitions (the replications of the rotated atom), which at this stage were studied manually rather than through the programming of a code. As a result, the visual form of each letter is deconstructed into fragments. The larger the angle of rotation, the more it impacts the letter's legibility and our ability to identify it.^{pp. 50–55} Additional tests isolated the atoms in the formula, enlarging each according to different proportions. Later on, I examined the

19 To use this typeface: <http://www.tytopopo.com/typemenot/index.html>

18 Lupton and Miller, p. 61.

transformation of a given atom's size during use. With the typing of each character, certain atoms grew by 5% – a generative change that led to the chipping of the letter and impacted its legibility.^{p. 56}

A self-reflexive gaze at my work as a designer serves to identify a dialogue between three prominent axes: print, perspective, and "discovery." Each of these axes expands to include additional meanings: print encompasses technique and template; perspective encompasses point of view, dimensions and time; and "discovery" encompasses exploration, chance and generativity. Each project gives expression to a different combination of these three axes. Above all, however, my projects are dominated by the central axis of typography. Typography fascinates me not necessarily as a type designer, but rather as a designer who uses letters as a visual tool for communicating ideas. In my research, I am interested in how the transformation of a letter, word or sentence relinquishes its function as a tool for communicating a verbal message, so that it may acquire a new function, that of communicating a visual message. In other words, I am interested in the point at which letter becomes image.^{fig. 11}

In the project *Molecular Typography Laboratory*, the three above-mentioned axes extend, like a triangle, around the central typographical axis. The dialogue between these four axes abstracts each Hebrew letter into a formal template, an index to a system as well as a formula, combining chance occurrences and invention from different thematic perspectives. The product of this project, the molecular alphabet, is dynamic, limitless, and free of constraints, obeying a set of rules while often



11 Kobi Franco, *Jacob Vs. Kobi*, poster, 2019, digital print on paper, 128 × 89.5 cm

rebelling against and changing them. The molecular typeface prides itself on its colorful plumes, offering a visual spectacle that obscures its identity, while simultaneously donning an ascetic gown and returning to its traditional function as a black book-letter.