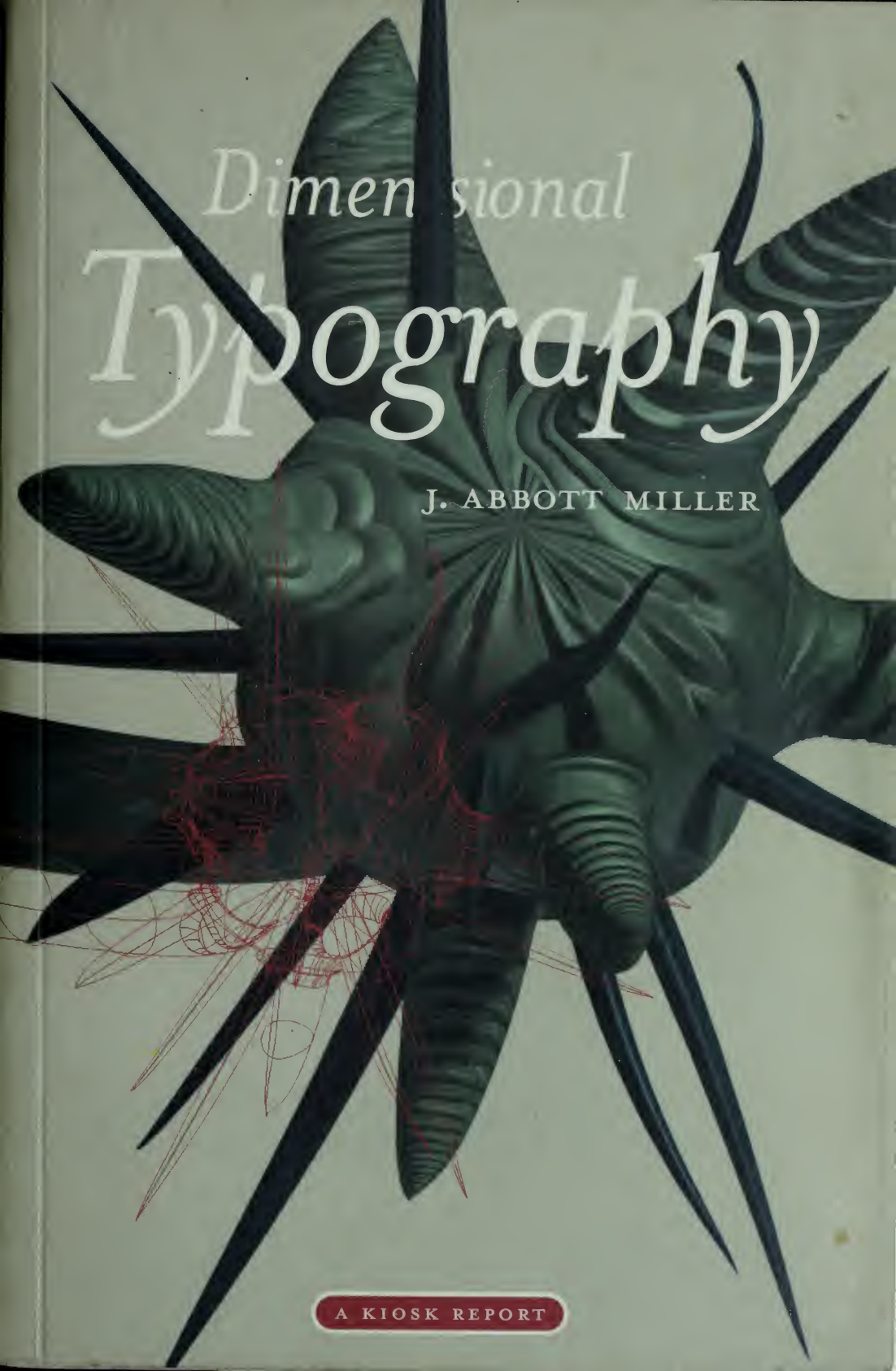
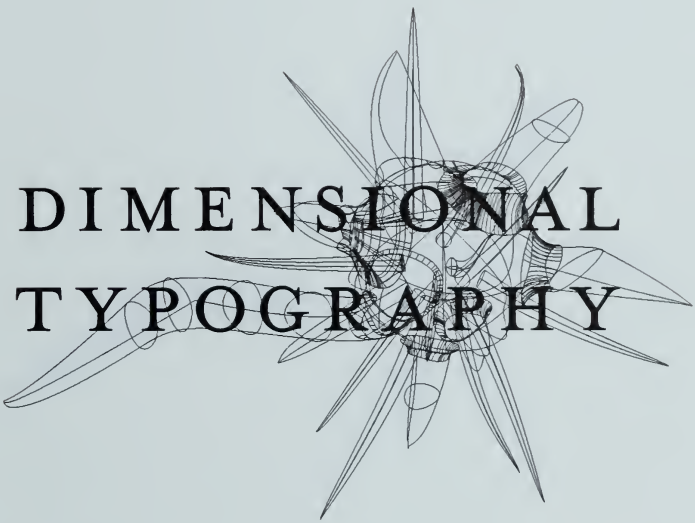
Dimensional Typography

J. ABBOTT MILLER



A KIOSK REPORT

DIMENSIONAL TYPOGRAPHY



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KIOSK: a small structure erected in a public place
for the sale and dissemination of goods;
especially newspapers, magazines, and candies.

DIMENSIONAL TYPOGRAPHY

Case Studies on

THE SHAPE OF LETTERS

in Virtual Environments

J. ABBOTT MILLER

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SUPPORTED BY THE FRIENDS OF GILBERT PAPER PROGRAM

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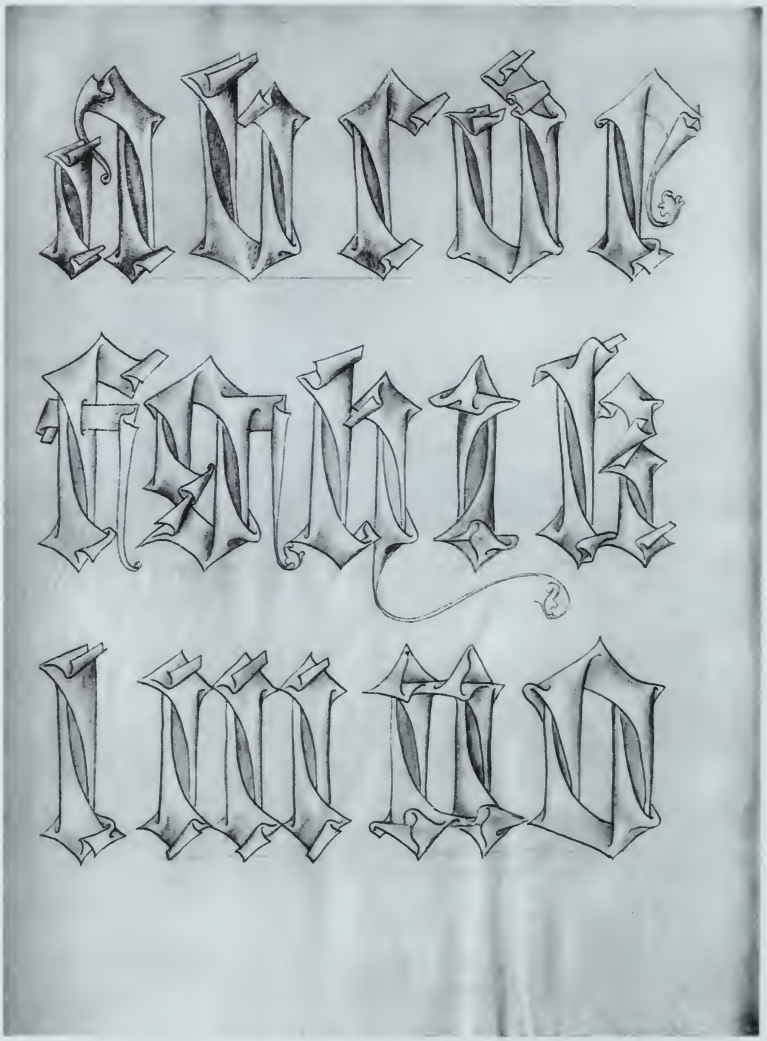


Letters from a 15th-century treatise, *Die Lehrbücher Maximilians I.* Reproduced in Heinrich Fichtenau, *Die Lehrbücher Maximilians I, und die Anfänge der Frakturschrift,* Maximilian Gesellschaft, Hamburg, 1961.

DIMENSIONAL TYPOGRAPHY

Typography has historically been conceived as the art of designing letters: DIMENSIONAL TYPOGRAPHY adds a spatial and temporal concern to the traditionally "flat" and static province of the letter. From early carved inscriptions to neon signs, numerous experiments in the history of typography and signage have interpreted letters as physical, spatial entities.[1] With the advent of motion pictures, animation and movie titles have explored the temporal possibilities of letters moving through space and time. By now, the spectacle of the dancing, decorated, and three-dimensional letterform is common in both print and electronic media.

Developments in graphic design and multimedia have suggested two directions for dimensional typography: on the one hand, "normal" letterforms are agents in an increasingly complex layering of information; the pioneering work of Muriel Cooper at the M.I.T. Media Lab is a prime example of this direction.[2] In these experiments, readers navigate textual displays through spatial paradigms that represent depth. This vein of inquiry replaces the small-to-large hierarchy of traditional print media with a near-to-far SPATIAL AND TEMPORAL dynamic—an eloquent transposition that maps neatly onto our sense of reading as a process of moving deeper and deeper into a document. This direction

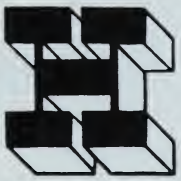
in dimensional typography investigates the spatial disposition of "flat" letterforms: depth is represented through the layering of successive planar surfaces.

Dimensional typography can also be understood as an investigation of the SCULPTURAL AND THREE-DIMENSIONAL FORMS of individual letters.[3] This line of inquiry assumes that the ability to think of letterforms as having spatial and temporal dimension brings with it new obligations and opportunities to augment the visual and editorial power of letters. In its focus on the individual letterform, this direction is akin to the concerns that preoccupy type designers. Rather than looking at how typography is arranged within a spatial construct, this vein of research looks at the formal, visual properties of individual characters.

Yet these two avenues of research need not be thought of as exclusive of one another: presumably, concern for the SPATIAL aspect of *navigation* and the SCULPTURAL aspect of *individual forms* will converge in a new approach to typography that fuses these two spheres of interest. Both directions suggest an expanded field for design. Readers and viewers are increasingly able and willing to navigate texts and negotiate challenging textual and visual environments, whether they are the physical spaces of exhibitions or the virtual environments of new media. Designers accustomed to dealing with the flat, pictorial paradigms of print are now dealing with the architectural, ergonomic, and cinematic paradigms of environmental, immersive media.

Historical precedents in lettering, typography, and signage exert a strong influence on how we think

about what three-dimensionality in letters might look like. Among the ways in which letters have been rendered dimensional, EXTRUSION is probably the most prevalent. It is a direct transposition of the ordinarily flat world of letters into objecthood. The effect is of a letterform multiplied and stacked in depth, like pages in a book. Nineteenth-century wood type explored illusionistic depth through elaborate perspective constructions.[4] Perhaps because of its deep roots in the history of ornamental and display typography, extrusion remains the most enduring strategy of dimensional typography today. Extruded letters signify monumentality, as in the *20th-Century Fox* logo, by rendering letterforms weighty and material. New software programs automatically "dimensionalize" fonts by extruding them and rendering them in simulated stone, glass, and chrome.[5]

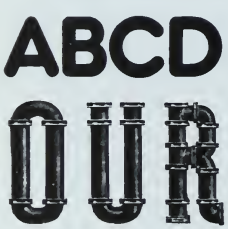


Extrusion is a predictable yet powerful expression of dimensional typography. Its utter obviousness and widespread use tends to occlude the variety of other ways letterforms may become dimensional. For instance, the ROTATION of a letter yields classical forms: spheres, columns, and cones. As a formal operation, performed digitally or on a woodworker's lathe, rotation is as basic as extrusion. But because it transforms the signature silhouette of a letter into a solid, often closed form, it is rarely seen in dimensional typography (even rarer is rotation along vertical, rather than horizontal axes). Rotation generates less

x =

automatically legible forms, yet it suggests ways of introducing three-dimensionality that escapes the conventions of extrusion.

TUBING is related to extrusion and rotation, but it limits the "lathing" operation to the stroke of the letter rather than the overall shape of the character. Novelty fonts like *Frankfurter*, or vernacular letters based on pipes, are figurative versions of tubing. Neon signs are an obvious three-dimensional application of tubing which has, in turn, become the basis for the display fonts like *Neon* and *Electric* and others.



Many letters evoke three-dimensionality through SHADOWING or the use of implied light sources.[6] This was another persistent motif of nineteenth-century wood type. But shadow fonts were also of interest to designers at the Bauhaus, who were attracted to the relationship of shadow letters to the "new vision" offered by photography. The design and photography of Joost Schmidt and Laszlo Moholy-Nagy incorporated the cast-shadows of letters, and Herbert Bayer developed an alphabet which relies exclusively on the cast shadow to delineate the letterform.[7] A similar strategy was used by the American type designer R. H. Middleton in his 1932 font called *Umbra*. Shadows have become such a standard technique that a "drop shadow" option is incorporated into most typesetting and page layout software, accessed as easily as *italics* or **boldface**.

Two dimensional letters resembling ribbons and those created with reference to stitching, threading, and lacing, comprise a genre linked to SEWING. In paintings from the Renaissance onward, curling ribbons are shown bearing letters. In ceremonial documents the letters themselves—rather than a supporting surface—are represented as undulating ribbons. The linked forms of many script fonts, such as Matthew Carter's 1966 *Snell Roundhand*, interpret the stroke of the letter as if it were formed from a continuous strand of ribbon. The possibilities of twisted, folded, and pleated letterforms suggests that the logic of sewing could fruitfully inform the construction of dimensional typography.

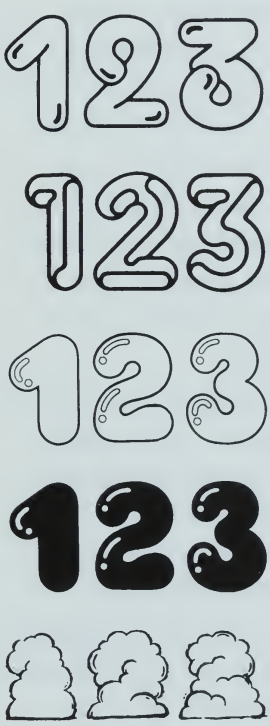
Another strategy with resonance for both two- and three-dimensions is MOLECULAR CONSTRUCTION: letters that are built from similar, small-scale units to form a larger whole. Individual units may be identical—as in the brick-like formation of bit-maps that comprise Zuzana Licko's fonts *Oakland* and *Emperor*—or merely similar in scale.

Another formal principle that builds larger forms out of smaller, although not necessarily identical

components, could be termed MODULAR CONSTRUCTION. Such letters are built from a discrete vocabulary of often interchangeable parts, a notion inherited from the language of industrialization. The rationalist ethos of modularity has funded a number of investigations in twentieth-century type design, including Theo van Doesburg's 1919 geometric font, Josef Albers's 1925 stencil font, and Herbert Bayer's 1925 *universal*. Common to all of these approaches is an interest in reducing alphabetic forms to a limited vocabulary of repeatable marks.

A more complex interpretation of modular construction may be seen in the ingenious *Fregio Mecano*, designed in Italy in the 1920s.[8] It reduces the alphabet to a sequence of curved, straight, and transitional forms, a kit-of-parts that can yield a tremendous variety of heights, widths, and thicknesses. *Walker*, a 1995 font by Matthew Carter is not a strictly modular font, but it shares the constructive logic of modularity by employing detachable slab-serifs. Accessed through optional keystrokes, the serifs may be applied as one might add a finial to a post.[9]

Another operation in this expanding, imprecise system of classification that now further challenges the nomenclature of typography,[10] may be awkwardly described as BLOATING. Bulbous, organic, corpulent, inflated, and biomorphic are all adjectives that come to mind when trying to describe letterforms that exhibit mutable, ductile qualities.



Bloated letterforms are reminiscent of both the way skin envelopes a skeletal understructure, and the shapes produced by the expansion and contraction of membranous materials. Thus the associations of bloated forms range from the organic, vegetal, and bodily, to the balloon-like and tensile. A range of display fonts produced in the 1960s and '70s exhibit cartoon-like forms that bear the influence of the Pop appreciation of toys, kitsch, and vernacular objects. Pop art directly engaged letterforms and numbers as part of its inventory of everyday life. The soft sculptures of Claes Oldenburg, which presented letters and numbers as soft, pillow-like constructions, have directly and indirectly informed the sensibility of 1960s and 70s novelty lettering.

In the case studies that follow, "dimensional typography" is explored at the micro-level of individual letterforms. We have interpreted historic and contemporary typefaces by transposing their two-dimensionality into volumetric and planar forms. Thus most of what follows builds on existing typefaces by historic figures like Ambroise Didot as well as contemporaries who have become our unwitting collaborators. The letters represented here are snapshots of "objects" constructed in digital environments: each letter could potentially be "output" as a three-dimensional artifact from the information used to describe them digitally. However, their physical manifestation is not a final objective: their exact role in either physical and virtual environments was bracketed off from their formal and conceptual development.

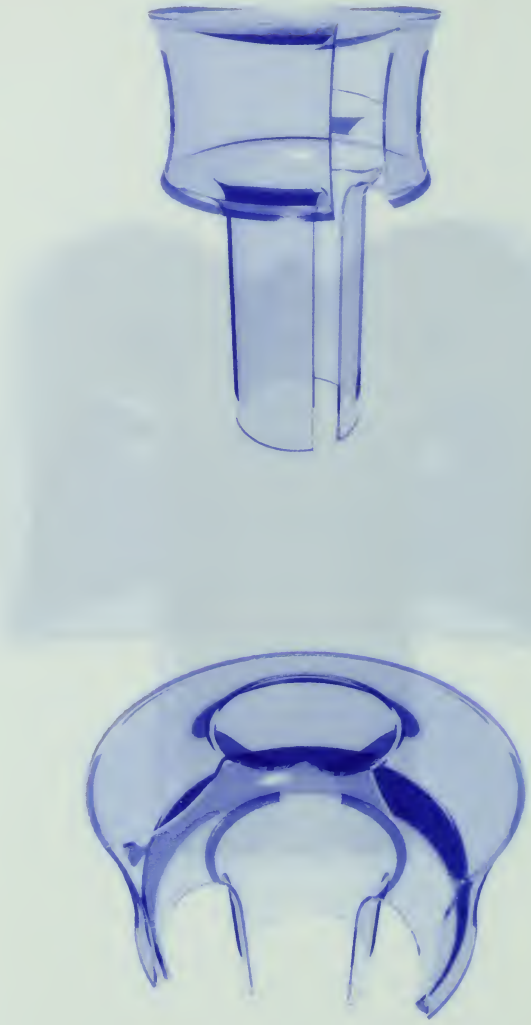
Many people were directly and indirectly involved in the conceptualization, production, and publication of this project. Thanks are due to Paul Carlos, Luke Hayman, Ji Byol Lee, and Jane Rosch of Design/Writing/Research; to Kevin Lippert, Kerry Fitzpatrick, Kim Lee, and Clement Paulsen of Design Systems, who contributed time and ingenuity in realizing CAD-generated images; to Rick Valicenti for his patience; to Gilbert Paper whose generous *Friends of Gilbert Paper* program enabled this publication; to Eduardo Dunphy and Guy Williams; to Claudia Gould, who invited me to show our work at Artists Space in early 1996; to Suzanne Salinetti of Studley Press; and finally to my partner Ellen Lupton and my radiant son, Jay Lupton Miller, my kindred spirits.

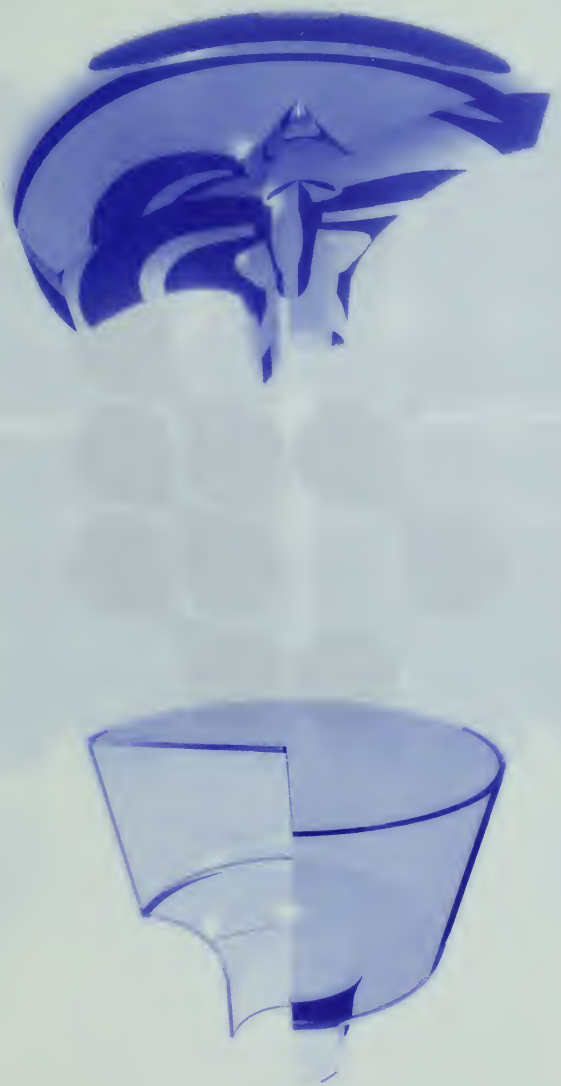
CASE STUDIES

"You have two goblets before you.
One is of solid gold, wrought in the
most exquisite patterns. The other
is of crystal-clear glass, thin as
a bubble, and as transparent...
[an] amateur of fine vintages...
will choose the crystal, because
everything about it is calculated
to reveal rather than to hide
the beautiful thing which it
was meant to contain.
...the virtues
of the
perfect
wine
glass
also
have a
parallel in typography"
Beatrice Warde, *The Crystal Goblet,* 1932

CRYSTAL GOBLINS

Based on a variety of 19th-century wood types (ABOVE), the *Crystal Goblins* rotate the serifs of the letterforms and render them as translucent vessels. In her classic essay, *The Crystal Goblet,* Beatrice Warde argued for the transparency of typography, suggesting that typography should recede in order to foreground verbal content.

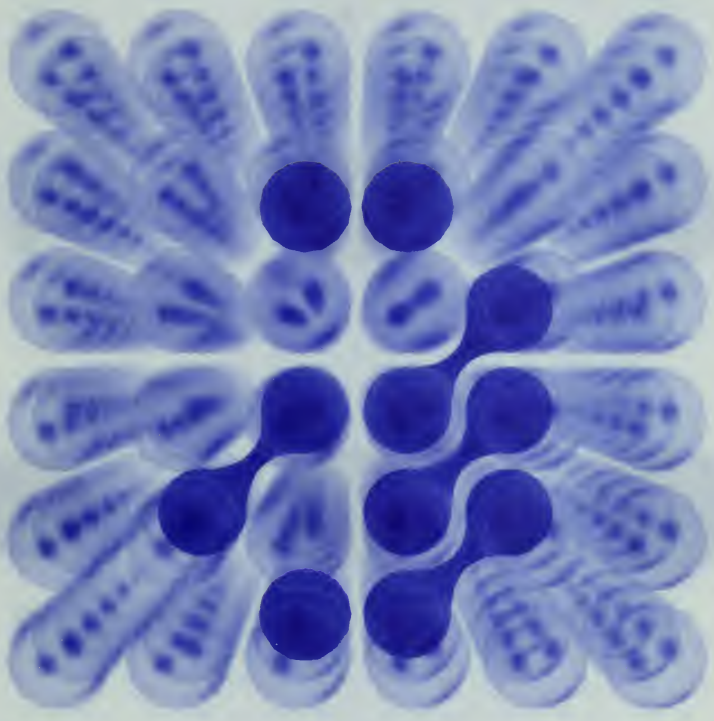




DR. NO-B

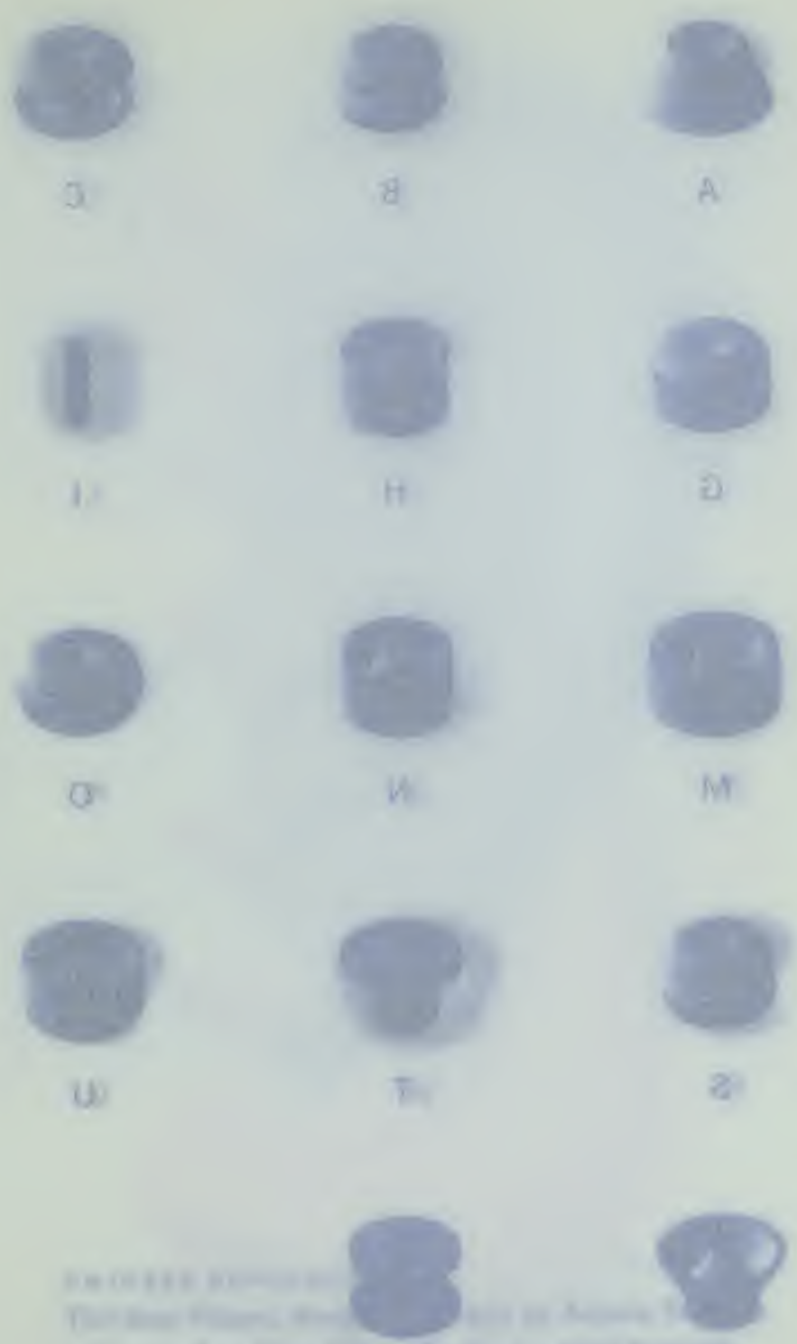
A font called *Dr. No-b*, by Ian Anderson,
first published in *Fuse Six*, 1992.

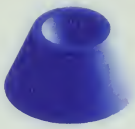
abcdefghijklmnopqrstuvwxyz



MERCURY

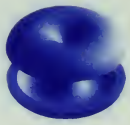
Mercury interprets the connecting-dot structure of *Dr. No-b* as a matrix of spheres in which letters are formed by viscous, lava-lamp-like linkages.





A

B



C

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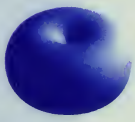

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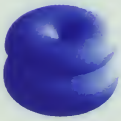

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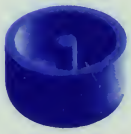

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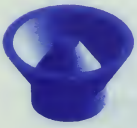

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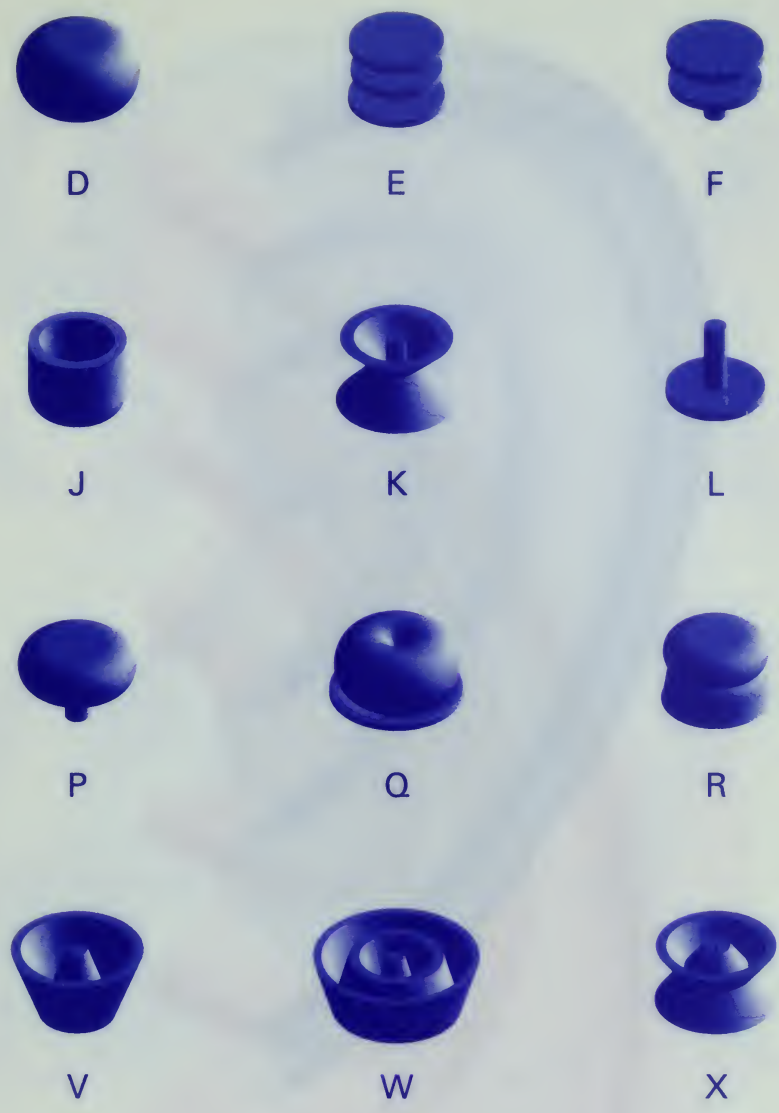
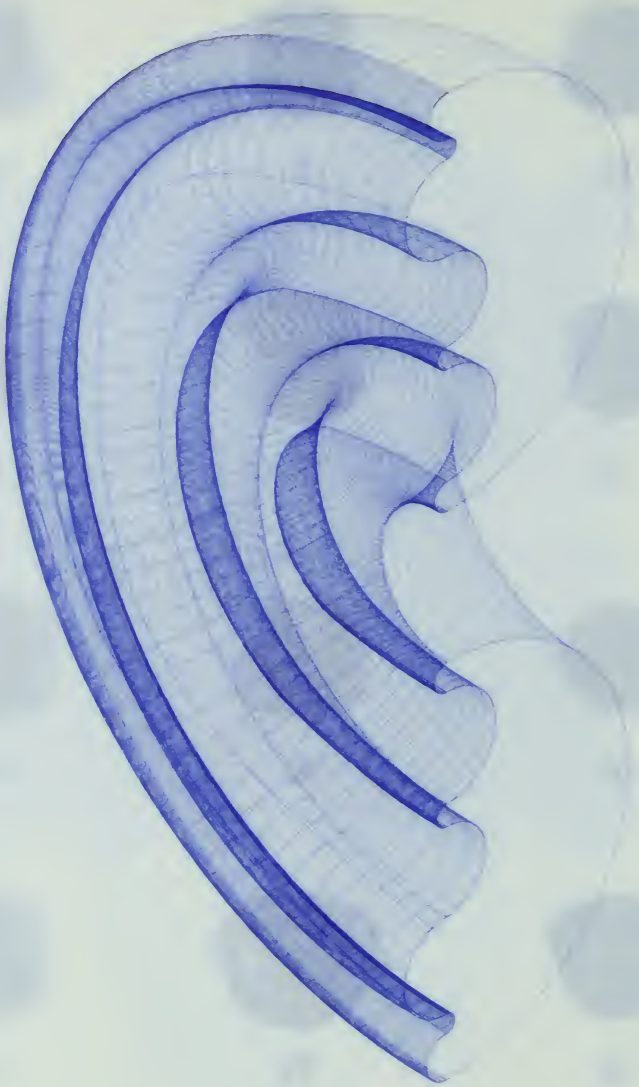
Z



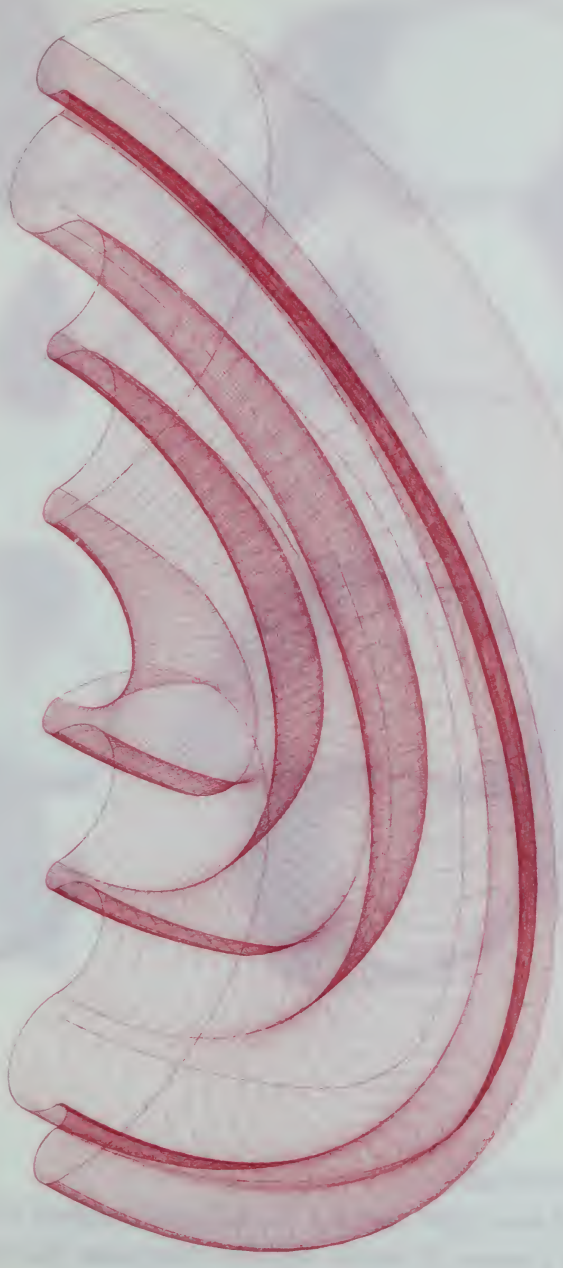
UNIVERS REVOLVED

The font *Univers,* designed in 1957 by Adrian Frutiger, was rotated to form *Univers Revolved,* a 1996 homage designed by Ji Byol Lee.



UR-ONION

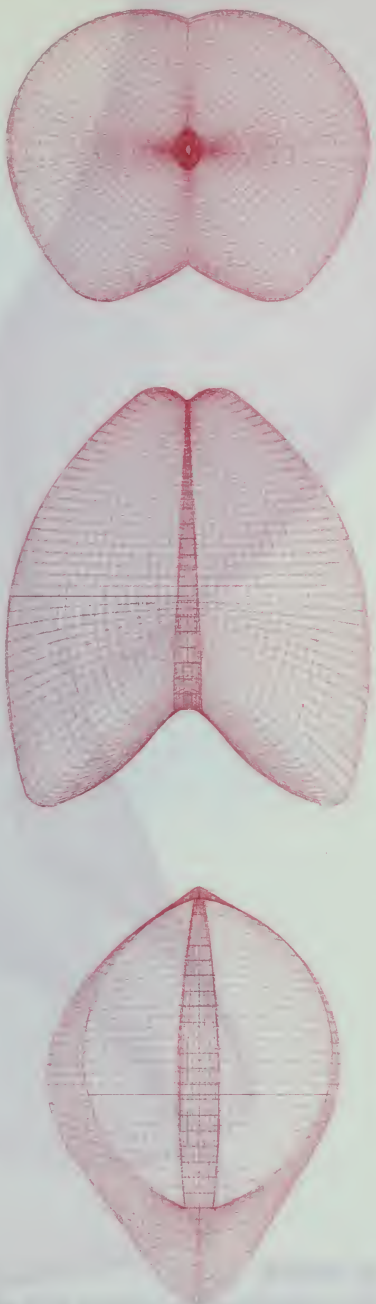
A form in which variations on a single letter *O* are incorporated into one rippled form.

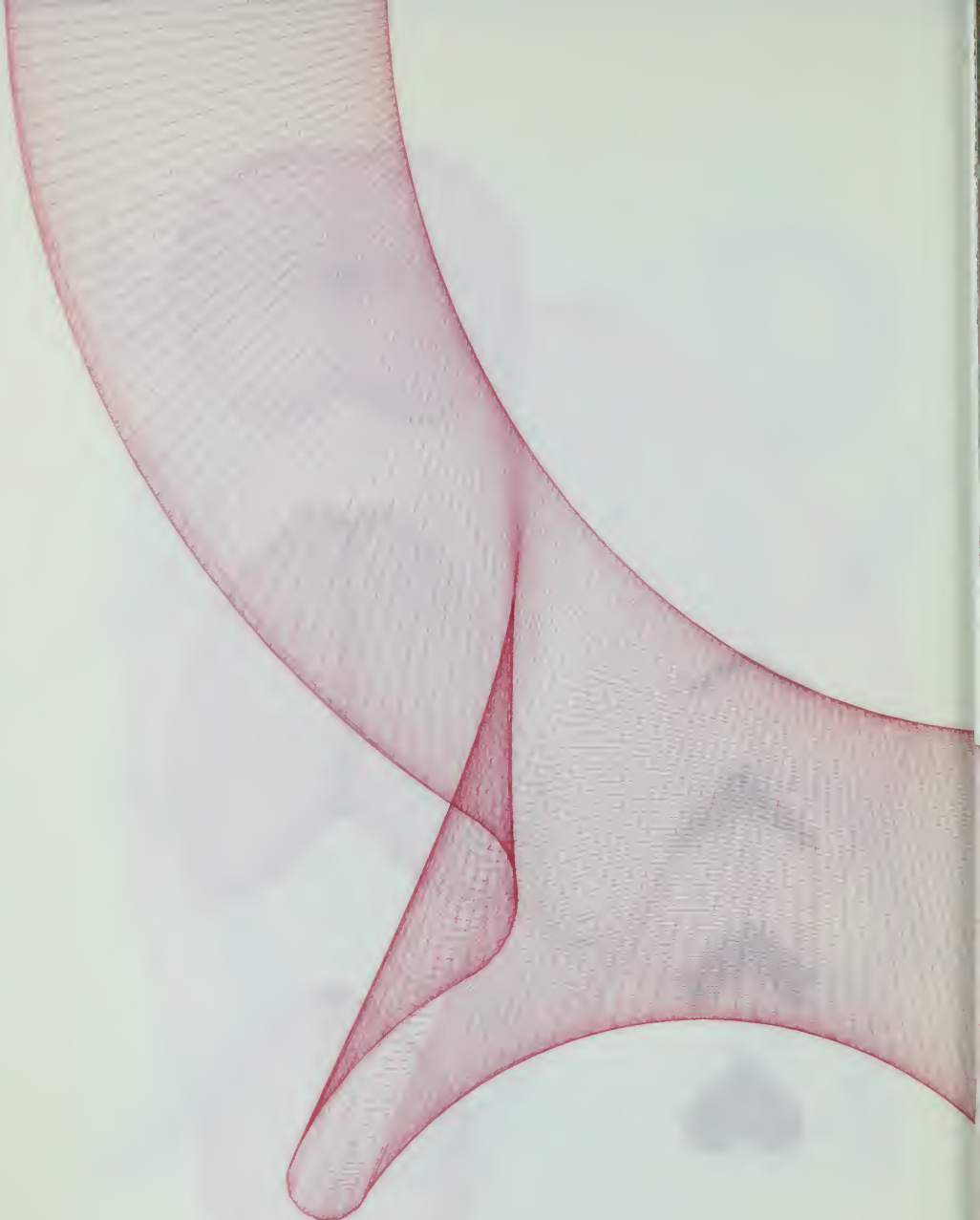


TAPEWORM

Based on a 15th-century round gothic capital *s* formed from a series of circles, *Tapeworm* interprets the circle as a sphere on which the letter is wrapped.

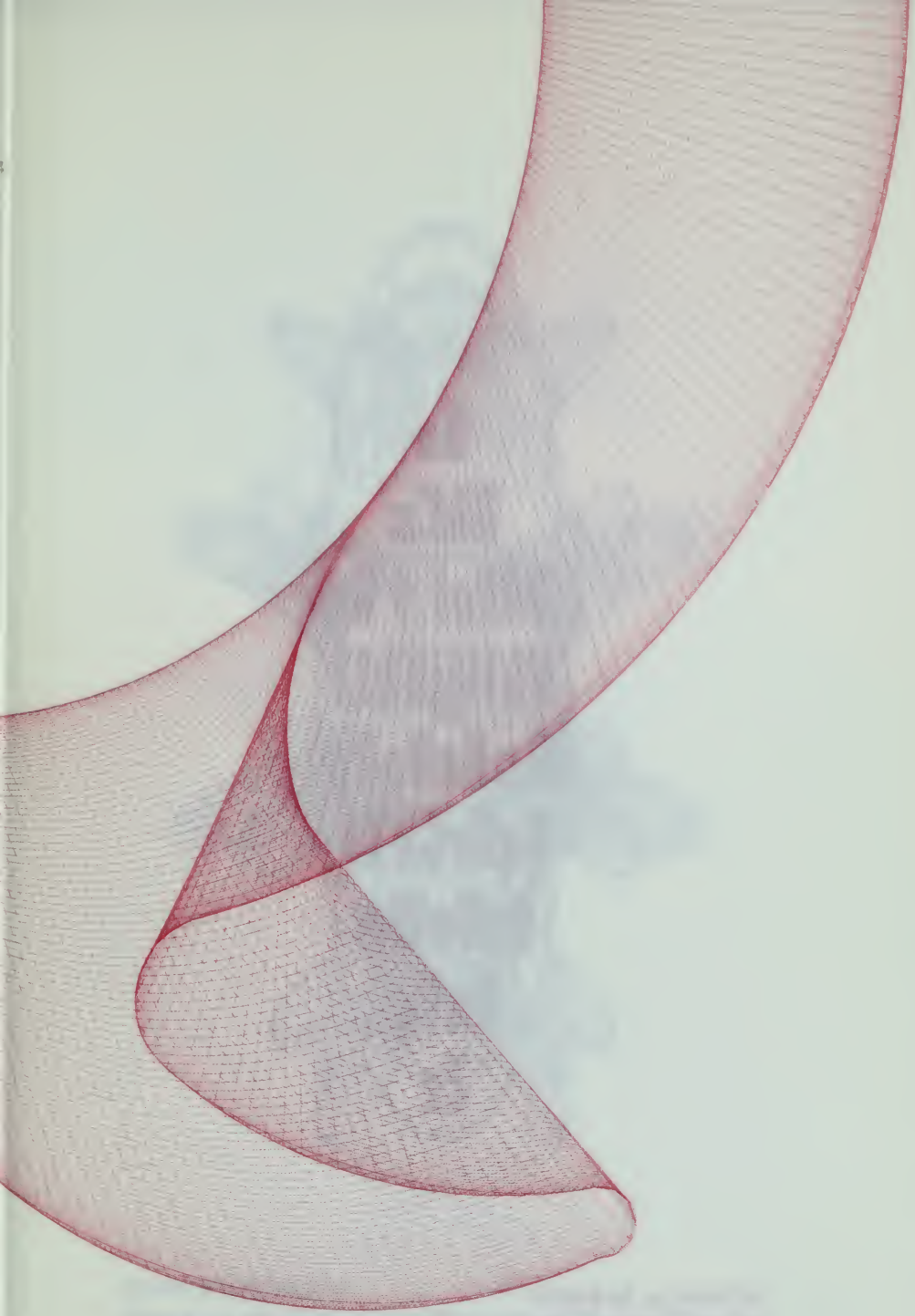
CIRCUM(FLEX)
The circumflex and the circumcision are both forms of marking. The three-dimensional extrapolation of the circumflex reveals a distinct homology.





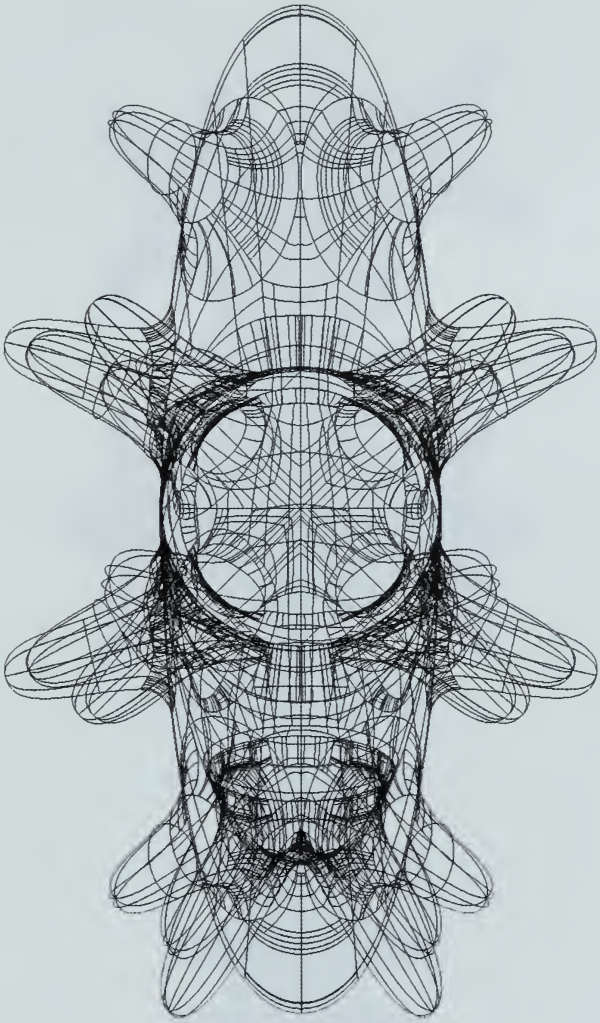
Q-MESH

The relationship of the tail of the capital *Q* to its O-shaped body is one of the most widely varying points of connection: Q,Q,**Q**,Q,Q. Here it is shown as a diaphanous mesh that wraps from inside out.



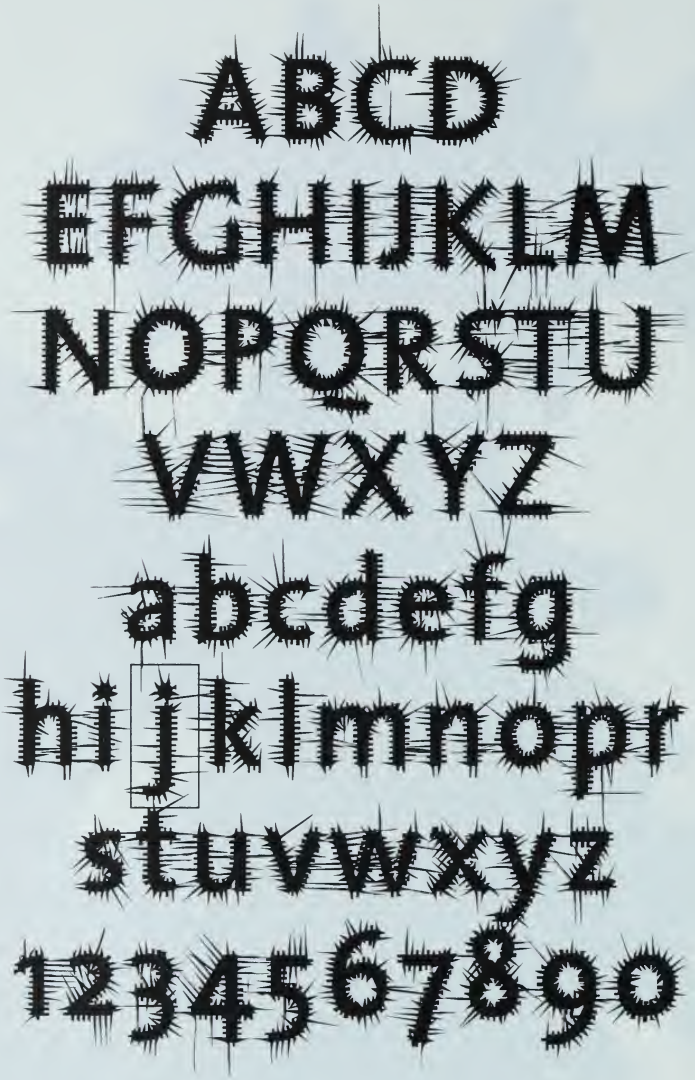
MODULA RIBBED

The font *Modula Ribbed* was designed in 1995 by Zuzana Licko.



POLYMORPHOUS

Based on the distinctive silhouette of *Modula Ribbed, Polymorphous* was designed for heightened reading pleasure in intimate settings.



JESUS LOVES YOU

Designed by Lucas de Groot in 1995, the font *Jesus Loves You,* and its companions, *Jesus Loves Your Sister and Jesus Loves Your Brother* exhibit an agitated crown-of-thorns-like complexity.

RHIZOME

A secularized adaptation, *Rhizome* exchanges nature for religion and interprets the prickly silhouettes of *Jesus Loves You* as a botanical motif. Above, the lowercase letter *j* is seen from overhead.

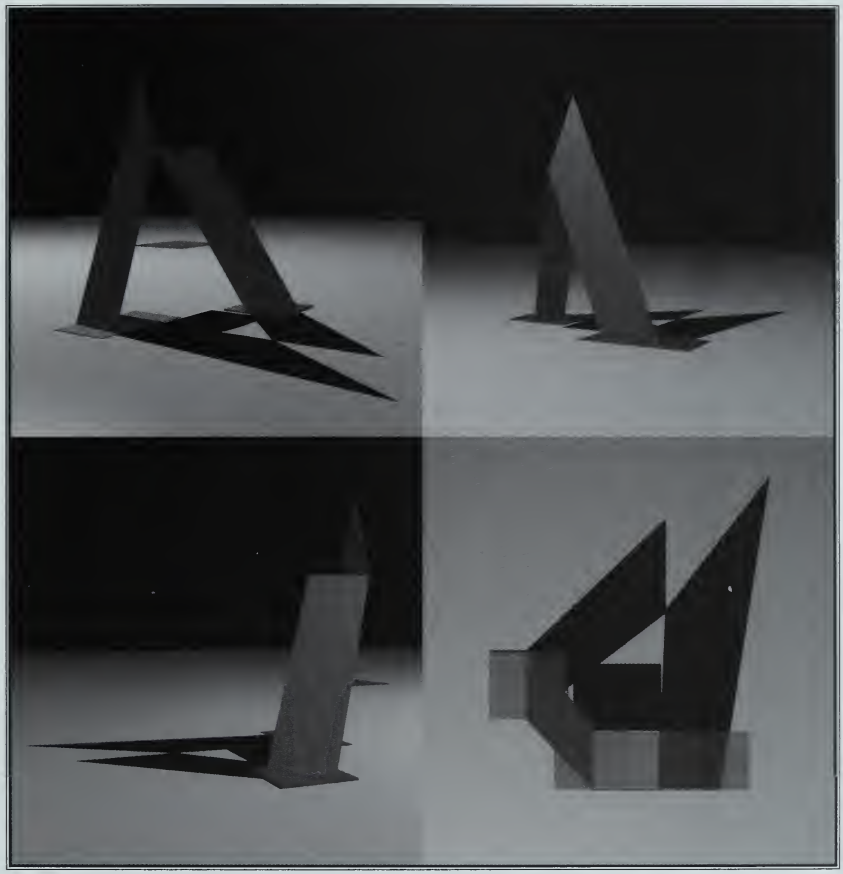
In name and spirit, *Rhizome* recalls the writings of French philosophers Gilles Deleuze and Félix Guattari, who distinguish two logics of the root or radical. The root proper is a singular, linear origin which bifurcates into the ordered, mirroring complexities of both the system of roots below ground and the plant above. The rhizome, on the other hand, is a curly, bulbous network with no single point of origin: "The rhizome itself assumes very diverse forms, from ramified surface extension in all directions to concretion into bulbs and tubers. ...The rhizome includes the best and the worst: potato and couchgrass, or the weed."[16]
From *A Thousand Plateaus,* 1987.

LIGATURE

Designed by Bart Overly in 1995, these forms weld letters into a single form which has alternate readings from different perspectives.

3 - DIDOT

Letter constructions based on the classic font *Didot* (UPPER LEFT), designed by François Ambroise Didot in 1784. The thick and thin variations of Didot are interpreted as functions of perspective and the position of planar elements.



FOOTNOTES

1. For a useful survey of lettering that includes signage and inscriptions, see Nicolete Gray, *A History of Lettering: Creative Experiment and Letter Identity* (Boston: David R. Godine, 1986). *Alphabet 1964: International Annual of Letterforms*, R.S. Hutchings, ed. (Birmingham, England: The Kynoch Press) includes several useful historical articles on letters in the environment.

2. For an interview with Muriel Cooper, see Jan Abrams, *Muriel Cooper's Visible Wisdom*, in *I.D.* Sept.-Oct. 1994 (Vol. 41, No. 5): 48-55.

3. Various artists and designers have explored this terrain, notably in the posters and sculptural constructions of graphic designer Takenobu Igarashi. Related investigations appear in the "word-as-image" approach of Herb Lubalin, Milton Glaser, and others.

4. For an excellent survey of the different types of such 19th-century typefaces, see Rob Roy Kelley's *American Wood Type, 1828-1900* (New York: Da Capo Press: 1977).

5. Three-dimensional type programs are reviewed by David Berlow in "The Shape of Things to Come," *Publish* (January 1993): 34-38.

6. The phrase "implied light source" is from Kimberly Elam, who provides a useful discussion of three-dimensional typography in *Expressive Typography: The Word as Image* (New York: Van Nostrand Reinhold, 1990).

7. For Bauhaus designers, see Hans M. Wingler, ed. *The Bauhaus: Weimar, Dessau. Berlin, Chicago* (Cambridge: M.I.T. Press, 1978).

8. The "Fregio Mecano (Carattere scomponibile)" is reproduced in *Alphabets and Other Signs*, ed. Julian Rothenstein and Mel Gooding (London: Redstone Press, 1991). The text indicates only that it was designed by "an unknown Italian in the 1920s."

9. For a review of this remarkable typeface, see Moira Cullen's article "The Space Between the Letters," in *Eye* (No. 19, Vol. 5) 70-77.

10. Technology is challenging the already difficult system of typeface classification. Catherine Dixon provides a useful discussion in her article "Why We Need to Reclassify Type," in *Eye* (No. 19, Vol. 5) 86-87.

PRODUCTION NOTES

DIMENSIONAL TYPOGRAPHY

Crystal Goblins
Rendered in Alias by Guy Williams.

Mercury
Rendered in Autodesk 3D Studio R4 by Kim Lee.

Univers Revolved
Designed and produced by Ji Byol Lee.

Ur-onion
Rendered in AutoCad by Eduardo Dunphy.

Tapeworm
Rendered in Alias/Wavefront PowerAnimator V7 by Clement Paulsen.

Circum(flex)
Rendered in AutoCad by Eduardo Dunphy.

Q-mesh
Rendered in AutoCad by Eduardo Dunphy.

Polymorphous
Rendered in Alias by Guy Williams.

Rhizome
Rendered in Alias by Guy Williams.

Deleuze and Guattari text from
A Thousand Plateaus: Capitalism and Schizophrenia,
Trans. Brian Massumi. (Minneapolis: University of Minnesota Press, 1987) 6-7.

Ligature
Designed and produced by Bart Overly in AutoCAD.

3-Didot
Rendered in Autodesk 3D Studio R4 by Kerry Fitzpatrick.

PAPER

Cover: Gilbert®, Ultra White, Wove, 80lb. Cover

Text: Neutech®, Ultra White, Wove, 90lb. Text and Gilclear®, White, Heavy

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Mrs. Eaves, Zuzana Licko, Emigré Fonts

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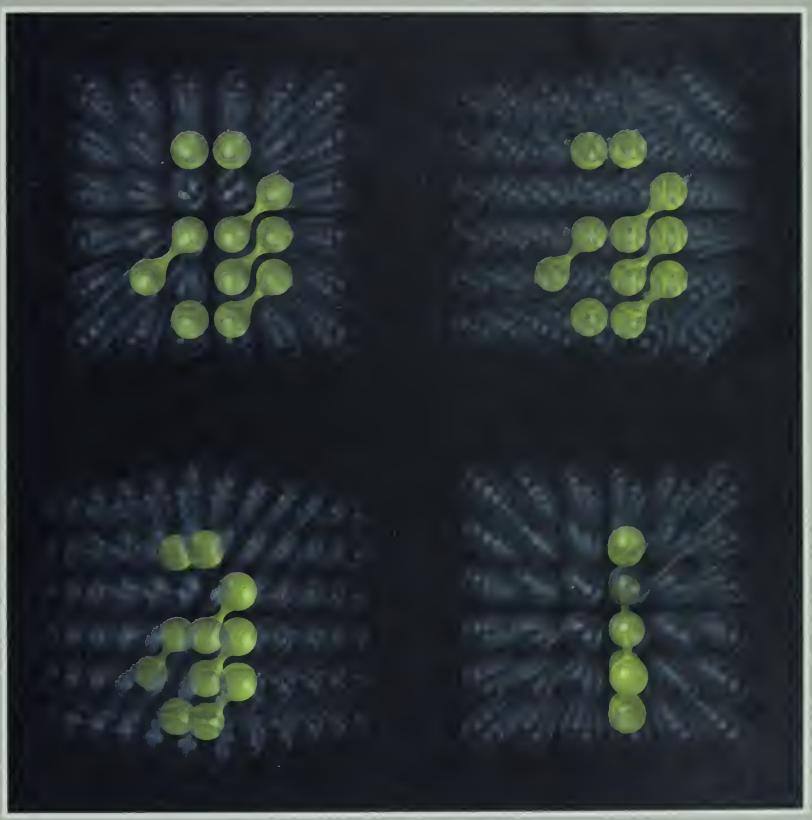

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