NC STATE UNIVERSITY College of Design

TRANS FORM ATION

New perspectives on design methods and processes

VOLUME 35

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Letter from the Editor

Throughout this publication, a number of different annotations can be found in the margins. These include traditional ones, such as author's notes and image captions, as well cross-references that point to related topics in other contributions, each contributor's relationship to the College of Design at NC State, and lines provided for you to take your own notes on the contributions.

Volume 35 of *The Student Publication* investigates how design methods and processes transform and adapt to new cultural and technological contexts. Contributors in this volume are educators, theorists, and practitioners from various design disciplines that are pushing the envelope in their respective areas of expertise. Considered as a whole, this body of work highlights many similarities present amongst design disciplines that may appear distinct from one another on the surface.

In a time where the demands for soon-to-be designers are quickly changing and the future is uncertain, we have a unique opportunity to step back and think about what design means to us. Although technological change is an important part of this conversation, there are many other factors affecting the way we think about and practice design. With this volume, we hope to create a dialogue not only about the way we currently approach design, but also how we might approach it in the future.

This year's publication, *Transformation: New perspectives on design methods and processes*, reflects the diversity of thought encouraged by the College of Design at NC State University. Lectures, exhibitions, and interactions amongst faculty and students all affect the experiences of students in the College of Design. Obvious or not, these activities and people influence future designers in some way, and also have larger implications for design beyond the College.

We also have to consider the role of *The Student Publication* itself as the contexts and formats we design for transform and change. This publication is accompanied by a more comprehensive website that includes the printed contributions, online open call contributions, and a glimpse into the process behind the making of the publication.[1] We hope you find Volume 35 of *The Student Publication* to be an engaging dialogue that reflects the multifaceted and complex reality of contemporary design practice.

Michael Carbaugh, Editor and Publication Designer

1. *The Student Publication's* website is http://www.ncsu.edu/project/design-projects/student-publication/

Table of Contents

Letter from the Dean

Marvin J. Malecha, FAIA, DPACSA

The consideration of process and methods in any form of decision activity is certainly as old as the ability of the human being to reflect. The exercises of Socrates reported by Plato continue to inspire us to think more deeply. *The Discourse on Method* written by Rene Descartes remains fresh and worthy of argument. The American educator John Dewey has inspired continual reflection on manner by which thought and process are introduced into education. A contemporary researcher, Donald Schön, has posed ways of addressing the education of the creative spirit in his book *Educating the Reflective Practitioner*. These suggestions are based on his observations of the interaction between design students and their instructors. Others such as Nigel Cross in his work *Designerly Ways of Knowing* and Geoffrey Broadbent in his work *Design in Architecture* have explored the subject deriving particular approaches to problem resolution. And most recently there is an explosion in the exploration of this topic including books and articles by authors such as Tim Brown, Bruce Nussbaum, and Hugh Dubberly. The list has grown too long to cite. Even Steve Job's reflection on the creation of the Beatles' song "Strawberry Fields" as reported by Walter Isaacson in the book *Steve Jobs*, is worthy of a lesson onto itself. Seemingly every discipline from engineering to business is now hyper aware of the importance of the creative process. And venerable institutions such Harvard and Stanford have discovered the importance of introducing design thought into business and engineering curricular experiences. All of this is fueled by the sense of inadequacy of the science, technology engineering and mathematics (STEM) approach to maintaining the innovative spirit of the nation in an ever more competitive world.

In our own College of Design we have a rich sixty-year history of exploring and teaching design methods and processes in a range of design disciplines. The earliest publications of the school reference the importance of considering design in an interdisciplinary environment among individuals of diverse perspectives. Individuals including Duncan Steward and later Henry Sanoff, John Tector and most recently Meredith Davis and Art Rice have each brought their own perspective and

contribution to this discourse. Members of this faculty have been among the founders of the Environmental Design Research Association as well as helping to establish the first joint research conference of the Architecture Research Centers Consortium and the European Association of Architectural Educators. And, Alumni of the College were among the founders of the United States Green Building Council (USGBC). Several *Student Publications* have explored methods and processes, from the role of model building to establishing research processes and methods in determining building program and form. These explorations have shown the complexity of design thinking in its many forms. It is a rejection of those who would narrowly define design thinking. It is therefore a fitting subject to be addressed again and again. If this College has within its DNA the pursuit of design thinking as a first principle, then we must continually re-explore the subject to uncover its dynamic quality.

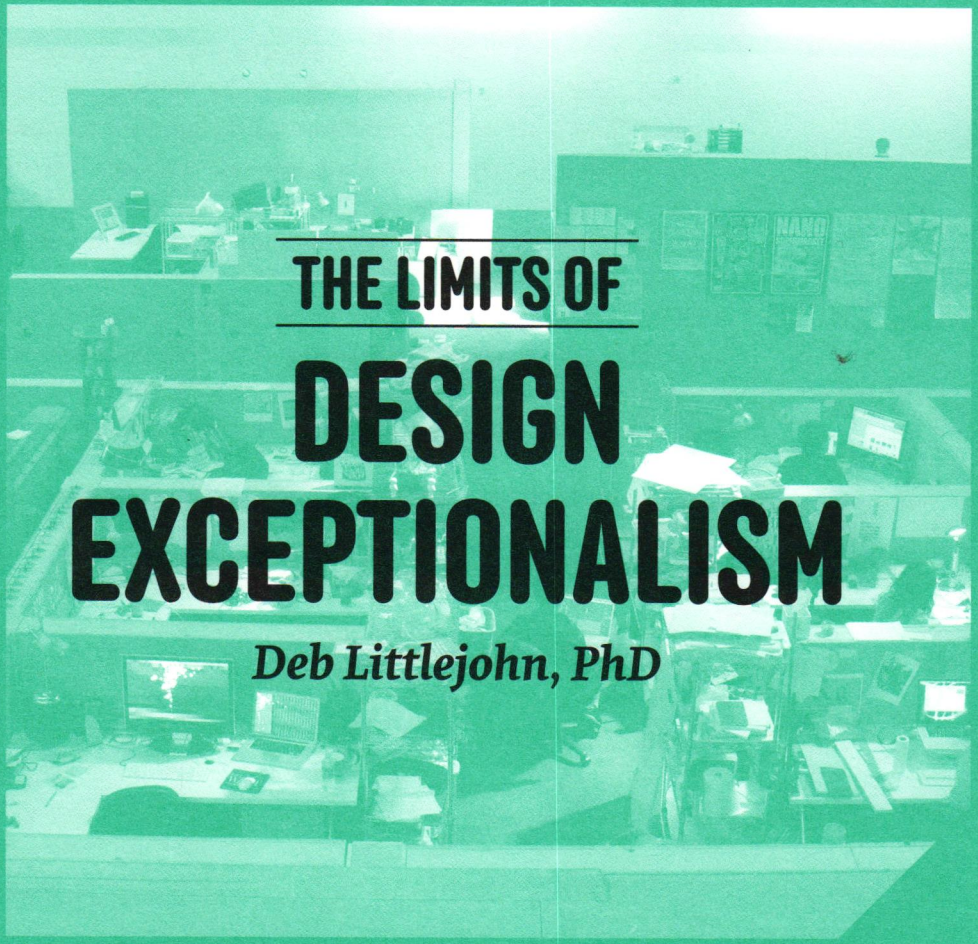
Each generation of designers must pause to consider this topic, if only to question whether the ways and means of one generation are unduly influencing another. Yet, both words, process and method, conjure images of a formally linear approach, largely related to scientific method, that is most likely leading to right and wrong answers. Similarly, the implication is that if it is not particular answers that are being sought out and investigated, then the design process itself is being observed as though from some objective posture keeping distance from the intensity of the creative urge. Kept at an even greater distance is the creative individual—so as not to contaminate the discussion of process and the clarity of the diagrams—to articulate the principles of creative decision-making. Yet it is the messiness of the process, the unmistakable malleability of the methods and the interaction of the idiosyncrasies of the creative personality and the designed outcome that must be the core of this collection of essays. A Southern expression guides this exploration, "the main thing is to keep the main thing the main thing!" The main thing here is the visceral quality of design. Keeping distance is avoiding resolution.

IN THE END IT IS INTENSE OBSERVATION LEADING TO CONNECTIONS AMONG DISPARATE PIECES OF INFORMATION—THE CONNECTING OF DOTS—THAT DEFINES THE CREATIVE PERSONALITY AND INFLUENCES THE CREATIVE ACT.

This publication has placed the emphasis on transformation and therefore the improvisation of the individual who is acting in the creative role. What is more likely to be true in this kind of investigation of process and methods in design is the uncovering of those moments when expression and improvisation drive conceptualization. As a result, this frames the work of creative individuals as distinct from one another and intensely interesting for the differences among them rather than the similarities that may exist between them. Diagrams of the creative process give way to a study of behaviors and related outcomes. It is not the "Aha Moment," or the realization that something has been proven wrong that fuels the improvisation of the creative process, it is the sudden realization, "I didn't expect this—isn't that interesting" that sets the fire of human curiosity. Beethoven in a letter refers to "striking fire from the flint of a man's mind" as the ultimate satisfaction to be pursued over all else. Karsten Heuer, in his book *Being Caribou*, chronicles the adventure of following the migration of a herd across Northern Canada and Alaska and comes to a moment of personal discovery when the process and method of the journey become a greater realization. His realization is the articulation of the very moment when the creative spirit is in alignment with the challenge of the question demanding resolution. Every creative individual can describe for you the moment Karsten Heuer describes as "thrumming."

> "Along the way we became aware of a special sensation. First we knew it to be the sound of the pounding hoofs of the running Caribou. Then it became a vibration we felt in our feet as the driving herd forced life to emerge all around it. Finally it came to rest in our spirit, as it was a shamanistic awareness we grew to trust as our true guide to the journey. This was the final lesson of our journey. It is the intense listening that makes us a creature of spirit and soul."

In the end it is intense observation leading to connections among disparate pieces of information—the connecting of dots—that defines the creative personality and influences the creative act. Transformation in project development is the result of the designer's ability to become intensely aware. The exploration that follows from the individual perspectives of a diverse group of authors gives the reader the opportunity to seek out these qualities in each of the selected contributors.



THE LIMITS OF DESIGN EXCEPTIONALISM

Deb Littlejohn, PhD

Littlejohn received her Ph.D. in Design in 2011 from NC State and has recently taught seminar and studio courses in the Department of Graphic and Industrial Design.

A FIELD APART?

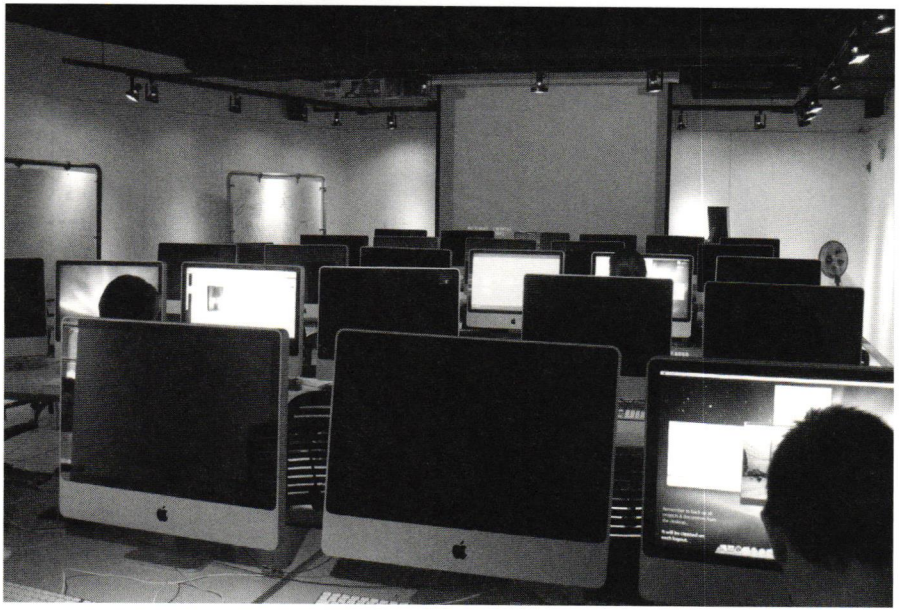
In 1831, Alexis de Tocqueville described the United States as "exceptional," giving rise to the idea of *American Exceptionalism*—the theory that this country is qualitatively different from other countries—a term that has since been rendered by proponents to mean "better," even "superior." Similarly, designers proclaim this mantra about their own field: design is a discipline apart, unlike all others; designers blend the arts *and* the sciences unlike those other "right-brained" fields, often deemed less creative. This essay focuses on three issues, using this narrative as a backdrop: design education's location in the academy; long-standing norms and values in design pedagogy; and the impact of emergent practices and digital technology in the context of new interdisciplinary approaches.

In seeking to understand these issues, it is useful to reflect upon the field's historical roots. In the mid 1900s, design education transitioned into an academic setting as part of a larger process of professionalization that took place much earlier in other professions such as medicine and law. The shift from apprenticeship to becoming an academic field in the university setting certainly has had far-reaching effects on design. Before joining the academy, novices learned their craft through apprenticeship and on-the-job training, however this model was "judged inadequate to the task" by prominent practitioners.[1]

A discussion of the Bauhaus, an early landmark of formal training and a pedagogic benchmark, is also relevant. Situated in the turmoil of Europe, generally, and the early nineteenth-century German Weimar Republic specifically, the Bauhaus was a product of the social, political and technological transformations taking place in Germany. After the school was closed by the Nazi regime, many faculty accepted positions at schools in new locales, thereby spreading Bauhaus ideology around the globe. Bauhaus scholar Rainer Wick has been critical of such attempts to transfer Bauhaus values to other institutions:[2]

1. Thomson, E. M. (1997). *The Origins of Graphic Design in America, 1870–1920*. New Haven: Yale University, p. 86.

2. Wick, R. *Teaching at the Bauhaus* (2000). Germany, Hatje Cantz Publishers, p. 56.



[*fig. 1*] The physical arrangement of the typical design school computer lab does not permit students to work in collaborative teams.

[*fig. 2*] Similarly, spatial plans for the design studio space reflect the traditional notion of the designer working alone in the atelier.

The shift from apprenticeship to becoming an academic field in the university setting certainly has had far-reaching effects on design.

> As a rule, pedagogy in the arts tends to be equally heedless of the extremely complex set of circumstances surrounding the Bauhaus pedagogy and the institutional framework of the school... Bauhaus pedagogy thus drops out of view as a historical phenomenon and its context is unacceptably disregarded... not only overlook[ing] a series of artistic phenomena that are important to the present, but also the very "plan" of the Bauhaus, whose interpretive system cannot be grasped in "excerpts."

Bauhaus ideals in design sought to elevate it on par with the fine arts and promote its social value through a utopian agenda. In reality the school's mission expressed Gropius' commitment to establish "constant contact with leaders" in German industry.[3] In the United States, however, American designers were more associated with advertising and the making and selling of products. They were not conflicted about this association; rather, they sought to operate "within a systematic set of expressions" that could marry Modern art and commerce.[4]

The bifurcation of American design education into two different camps—advertising and graphic design—followed the arrival of Bauhaus *emigrés* and Yale's establishment of a graphic design program in the 1950s.[5] While Yale sought to align design with architecture, most U.S. programs became associated with the studio arts—witnessed today in the location of most design programs in colleges of fine arts. As design programs became established in this art-oriented context, instructors trained in painting, drawing and sculpture taught design as a commercial—i.e., tainted—application of art.[6] The other result of this location that perhaps had the greater consequence, however, was the inculturation of an aesthetic ethos prioritizing original, *individual* creative expression. Design still clings to these outdated associations, despite a fine arts hierarchy that has created somewhat of an "identity crisis" in the profession. One can find evidence for this phenomenon as early as Italian Futurist Fortunato Depero's 1929 heroic manifesto that identified advertising designers as artists, or a few years later, graphic designer Ken Garland's 1967 treatise castigating the profession for its association with the corporate business world.[7, 8]

3. Cross, A. (1980). "Design and General Education." *Design Studies*, Vol. 1, No. 4, 202–206, p. 49.

4. Leiss, W., Kline, S. and Jhally, S. (1997). *Social Communication in Advertising: Persons, Products and Images of Well-Being*. New York, NY: Routledge. p. 85.

5. Kelly, R. R. (2001). "The Early Years of Graphic Design at Yale University." *Design Issues*, Vol. 17, No. 3, p. 3–14.

6. McCoy, K. (1998). "Education in An Adolescent Profession." S. Heller (Ed.) *The Education of a Graphic Designer*. New York, NY: Allworth Press, p. 3–12.

7. Numerous examples are found in professional journals: c.f., Behrens,

AN ISOLATED FIELD: DISCIPLINING THE DISCIPLINE

As it is taught and studied, most view design as an emerging discipline. Disciplines do not arise in isolation, but build upon knowledge from preexisting fields—yet there is not much *discipline* in the design discipline. Great changes have been taking place in the field, exposing many conflicts in maintaining the artist identity. Furthermore, design activities can no longer be segregated into the usual divisions of specialty, and new frameworks for understanding emergent multidisciplinary practices are needed.[9] Whether conscious or not, design has, however, systemically isolated itself from other academic disciplines. Educational theorist Donald Schön's writing is notable with regard to design's disciplinary emergence:

> Just to the extent that a reflective practicum succeeds in creating a world of its own, it risks becoming a precious island cut off both from the world of practice to which it refers and from the world of academic courses in which is resides. If it is to avoid this fate, it must cultivate activities that connect the knowing- and reflection-in-action of competent practitioners to the theories and techniques taught as professional knowledge in academic courses.[10]

As shaped in the academy, design pedagogy adapted to institutional norms such as accreditation, credit structures and an academic calendar comprised of semesters and summer vacation. Students enroll in a curriculum packed full of requirements for their major, learning one aspect of it, and then moving on to another course to learn another. A further consequence of its setting and Bauhaus legacy is a curriculum that presents design to students as a series of fragmented practices—e.g., *Typography*, *Design for the Web*, *Packaging Design*, *Motion Graphics* and *Branding*. The segregation of design into artifactual chunks belies the complex contexts and situatedness of skills in which it is produced. Tensions between formal study and the need to prepare students for professional practice further isolate design and inhibit its development. The discipline has little contact with other knowledge communities; rather, faculty tend to be suspicious of theories from other fields.[11] It is not unusual to find instructors dictating studio agendas based on topics that interest only them or promoting views of practice based on little more than

R. R. (2000). "The Hole in Art's Umbrella: Graphic Design Faculty at Art Schools Still Don't Get No Respect from their Fine-Arts Colleagues." Print, Vol. 54, No. 4, 24–26.; Glaser, M. (2000). *Art is Work: Graphic Design, Interiors, Objects and Illustration*. Woodstock, NY: Overlook Press.; Margolin, V. (1992). "Thinking about Design at the Edge of the Millennium." *Design Studies*, Vol. 13, No. 4, 343–354. Caplan, R. (1999). "Designer, Heal Thy Self," in *Print* Vol X, X, 40.; Landa, R. (2002). "A Cold Eye: 'No Exit' for Designers," in *Print*, Vol. 56, No.2, 22.

8. Depero, F. (1929). "Outline of the Art of Advertising Manifesto." M. Bierut (Eds.) *Looking Closer 3: Classic Writing on Graphic Design* (1999). New York, NY: Allworth Press, 43–44. Garland, K. (1967). "Here are Some Things We Must Do." M. Bierut (Eds.) *Looking Closer 3: Classic Writing on Graphic Design* (1999). New York, NY: Allworth Press, 43–44.

9. Dykes, T. H., Rogers, P. A., and Smyth, M. (2009). "Towards a new disciplinary framework for contemporary design practice." *CoDesign*, Vol. 5, No. 2, 99–116.

personal experience. Studio is the foundation of the designer's training. Studio culture encourages long hours and late nights at the expense of other coursework—and physical well-being.[12] The curriculum isolates students from other disciplines with credit systems requiring three, four, even five hour studios, several times a week. Meanwhile, the policies of many design programs rarely permit outside majors in the studio, or non-design faculty teaching the curriculum. Students are typically graded as the sole producers of their assignments and seldom encouraged to work collaboratively or wear hats other than "designer."

NEW FORMS OF PRACTICE

In the late 1980s, computers became a common sight in the studio—though they were set up in cubicle fashion, a configuration anathema to design practice then and now. It seems ironic today that graphic design schools were early adopters, while most professional discourse lamented the ways in which the computer was ruining the field. Design has now "grown to include the design of processes, services, structures and systems; in sum, a series of activities that could be defined as the design of the contexts within which traditional design operates."[13] Its expansion means that professionals confront more complexity in the things they make: multiple expertise is required to bring an idea to completed state; designers often must work alongside colleagues from other fields as well as project stakeholders, including audiences and end users, in emergent areas such as interaction design, design strategy, digital media design and service design, for example. The computer is not just a production tool, but a communications platform that will continue transforming design. Collaborative technologies let the general public participate in creative activities that have, until recently, been the exclusive domain of designers, affecting "what is designed, how it is designed and who designs it."[14] Software and digital technologies are an essential part of emergent design practices. New ways of working go beyond traditional designer-to-client relationships, allowing for designer-led as well as collaborative and participatory approaches.

10. Schon, 1987 p. 312

11. Blauvelt, A. (1994b). "Disciplinary Bodies: The Resistance to Theory and the Cult of the Critic." *Visible Language*, Vol. 28, No. 3, 196–202.

12. Boyer, E. and Mitgang, L. D. (1996). *Building Community: A New Future for Architecture Education and Practice*. Ewing, NJ: The Carnegie Foundation for the Advancement of Teaching.

Reas demonstrates how code allows artists and designers to think in terms of procedures and systems beginning on page 62.

13. Frascara, J. (2008). "Design Education in the Last Fifty Years: A Personal Perspective." R. Sassoon (Ed.) *The Designer: Half a Century of Change in Image, Training, and Techniques*. Chicago, IL: The University of Chicago Press, 40–50, p. 49.

14. Sanders, E. and Stappers, P. (2008). "Co-creation and the new landscapes of design." *CoDesign*, Vol. 4, No. 1, 5–18.

Edelstein explains how neuroscience can inform architectural design decisions beginning on page 42.

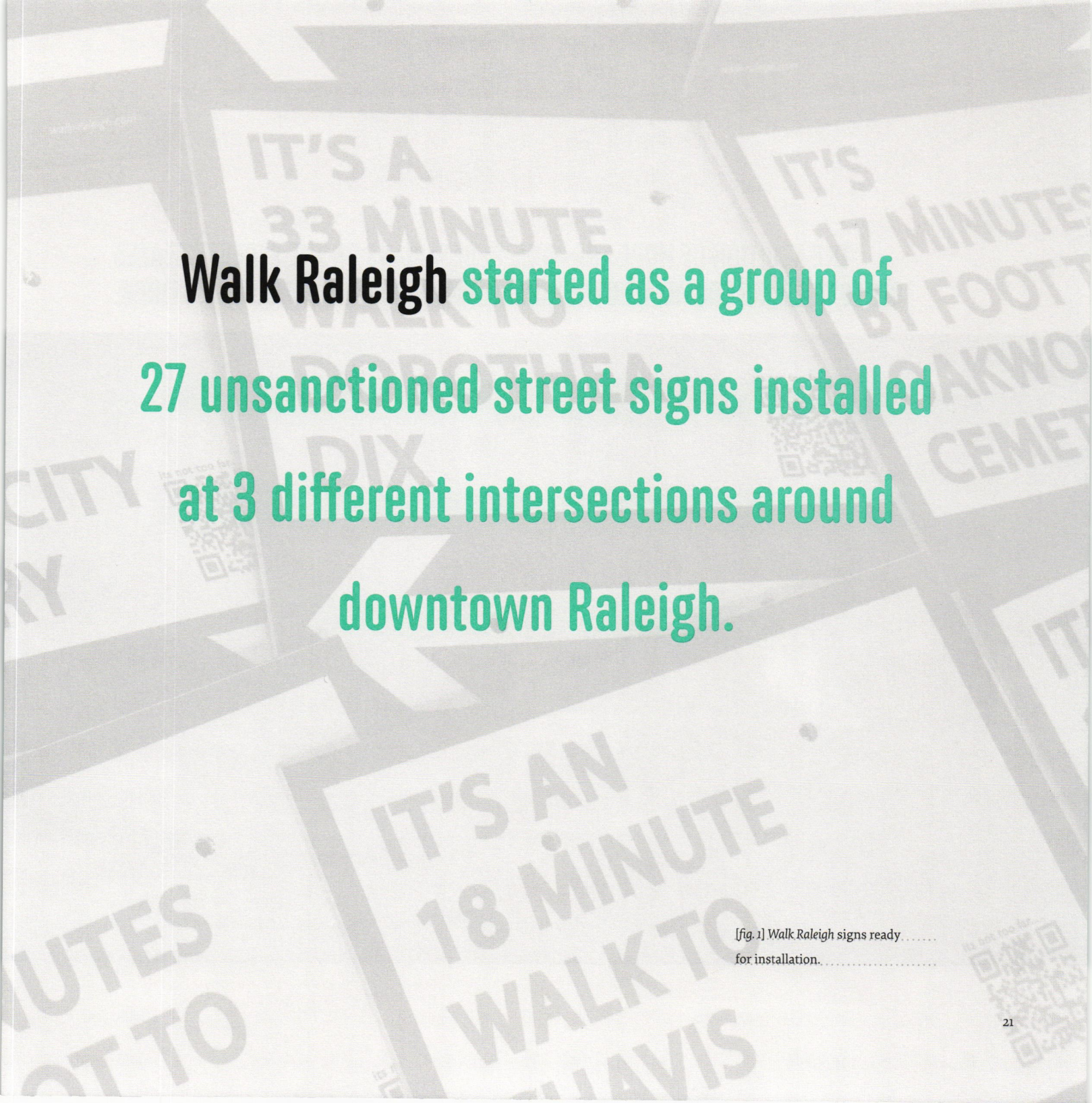
Social, professional and technological shifts have sparked recent debates over the ability of design schools to meet the demands of preparing students for new conditions of practice. The rhetoric of design exceptionalism that sets designers at the center of their work isolates them from the very fields with which they need to collaborate and learn. Programs need to ask fundamental questions over their sole mission to train individual practitioner-form maker. Faculty are asked to teach an unfamiliar set of skills alongside the usual competencies of form and craft. There are numerous challenges to design curricula and the pedagogy through which they are delivered, even though the studio model of critiques and projects has changed very little—even if computers have altered what gets taught. While there is a valid complaint that software instruction subsumes the curriculum and overburdens instructors with "too much to teach," nevertheless, when they seek to incorporate new teaching methods, faculty have been "unable to let go of or even challenge the existing structure."[15, 16] The emergence of new practices—and the new competencies that accompany them—demand an evaluation of what defines a successful life in design. If the field wants to attain disciplinary status, it needs to define that in accord with its university setting. The profession needs a diverse array of people working at all ends of the spectrum—from professional practice and design production, as well as in the production of knowledge, theory and methods.

15. Morin, J. (1999). "Integrating Technology into a Problem-solving Curriculum." *Teaching with Technology Today Newsletter*, Vol. 5, No. 3, unpaginated Web article. Available at: www.uwsa.edu/ttt/morin.htm. Accessed March 2007.

16. Davis, M. (2007). "The Cult of ASAP." Available at: http://observatory.designobserver.com/entry.html?entry=5837. Accessed September 2007.


WALK
RALEIGH
Matt Tomasulo

Walk Raleigh started as a group of 27 unsanctioned street signs installed at 3 different intersections around downtown Raleigh.



[fig. 1] Walk Raleigh signs ready for installation.

THE ADDITION OF MORE AND MORE PEDESTRIANS ON THE STREET CREATES CITIES THAT ARE SOCIALLY, ECONOMICALLY AND ENVIRONMENTALLY HEALTHIER.

[*fig. 2*] Installation of *Walk Raleigh* signs in downtown Raleigh.

The signs are basic: they include an arrow, a color-coded destination, a QR code, and text stating how many minutes by foot it is to walk to a particular destination. Destinations include commercial areas (purple), civic landmarks (blue), and public open space (green). Between January 18 and February 23, 2012, *Walk Raleigh* attracted local, national and international attention, appearing on *The Atlantic*, *NPR* and *The BBC*, among other media outlets.[1]

1. Read more at walk-yourcity.com.

On February 23, as the project exploded onto the national media scene, the signs were taken down by the City of Raleigh because of a complaint that they were not legal. On March 6th, the project was presented before City Council and unanimously approved as an educational city pilot program in coordination with *The 2030 Comprehensive Plan for the City of Raleigh*, and the signs went back up on Monday, April 9. After meeting with the Director of Transportation Planning, the *Walk Raleigh* team is now planning to create and install signs at another 5 intersections by the end of the three-month pilot program.

The wide range of media exposure generated many inquiries about adapting and producing this campaign elsewhere.

WHY WALKING?

Beyond the obvious personal health benefits, the addition of more and more pedestrians on the street creates cities that are socially, economically and environmentally healthier. Socially, more pedestrians means more contact among people, building trust in a neighborhood and yielding safer communities. Economically, more pedestrians means less people driving and fewer infrastructures needed to move people.

Tomasulo's Walk [Your City] *project began in downtown Raleigh while Tomasulo was working towards a Master of Landscape Architecture degree at NC State and in Master of Urban Planning degree at UNC Chapel Hill.*

[*fig. 3*] *Walk Raleigh* signs installed in downtown Raleigh.

We have found that one of the greatest obstacles with walking is actually public perception—i.e. "It's too far to walk!" Analogous to other cities, people in Raleigh might perceive a destination to be much further away than it actually is simply because they are accustomed to another mode of transportation. We strive to positively influence this perception through *Walk Raleigh*.

White uses architectural interventions to strengthen community food systems, another important health factor, beginning on page 54.

Everyone walks. Having a healthy environment (socially, economically and environmentally) provides the option that everyone should have the choice to be a pedestrian.

Walk Raleigh has proven that simple interventions can dramatically influence perception and change policy. The campaign encourages walking by helping residents discover that it really is not that far to walk to places in Raleigh. The signs initiate that "Aha!" moment when a citizen realizes that, "It's only a 10 minute walk to that park!—Really?"

We believe open and positive conversations about how we live can lead to good future decisions. We see these signs as a great tool to help cities experiment with new ideas and tactics for accommodating different transit choices and introducing new civic ideas with minimal risk. A project intended for the greater good should not be limited to any one group, organization or place.

RISE WALK [YOUR CITY]

With the incredible support and demand for the project from all over the United States, we were inspired to devise a way to make this simple wayfinding campaign more accessible and replicable. The production technology should not limit recreating a similar project in one's own city. These ideas ultimately led us to develop the *Walk [Your City]* project as a tool to help facilitate conversations and services about expanding the *Walk Raleigh* project.

[*fig. 4*] Obtaining directions to a destination by scanning a QR code.

In conjunction with my master's project, I launched *Walk [Your City]* via the crowdfunding platform Kickstarter on March 28th, 2012.[2] Kickstarter is an incredible online resource. The concepts of crowdsourcing and crowdfunding are now recognized by mainstream media as acceptable and trustworthy practices. We chose to launch *Walk [Your City]* via Kickstarter because the platform functions successfully as a publicity tool as well as to generate funding. The crowd literally votes with their dollars, mitigating risk and gaining real time market validation if the idea proves worthy.

2. Crowdfunding reaches out to the mass population to collectively donate small amounts of money for a larger project cost—i.e. 1,000 people donating $10 to help make a $10,000 project happen.

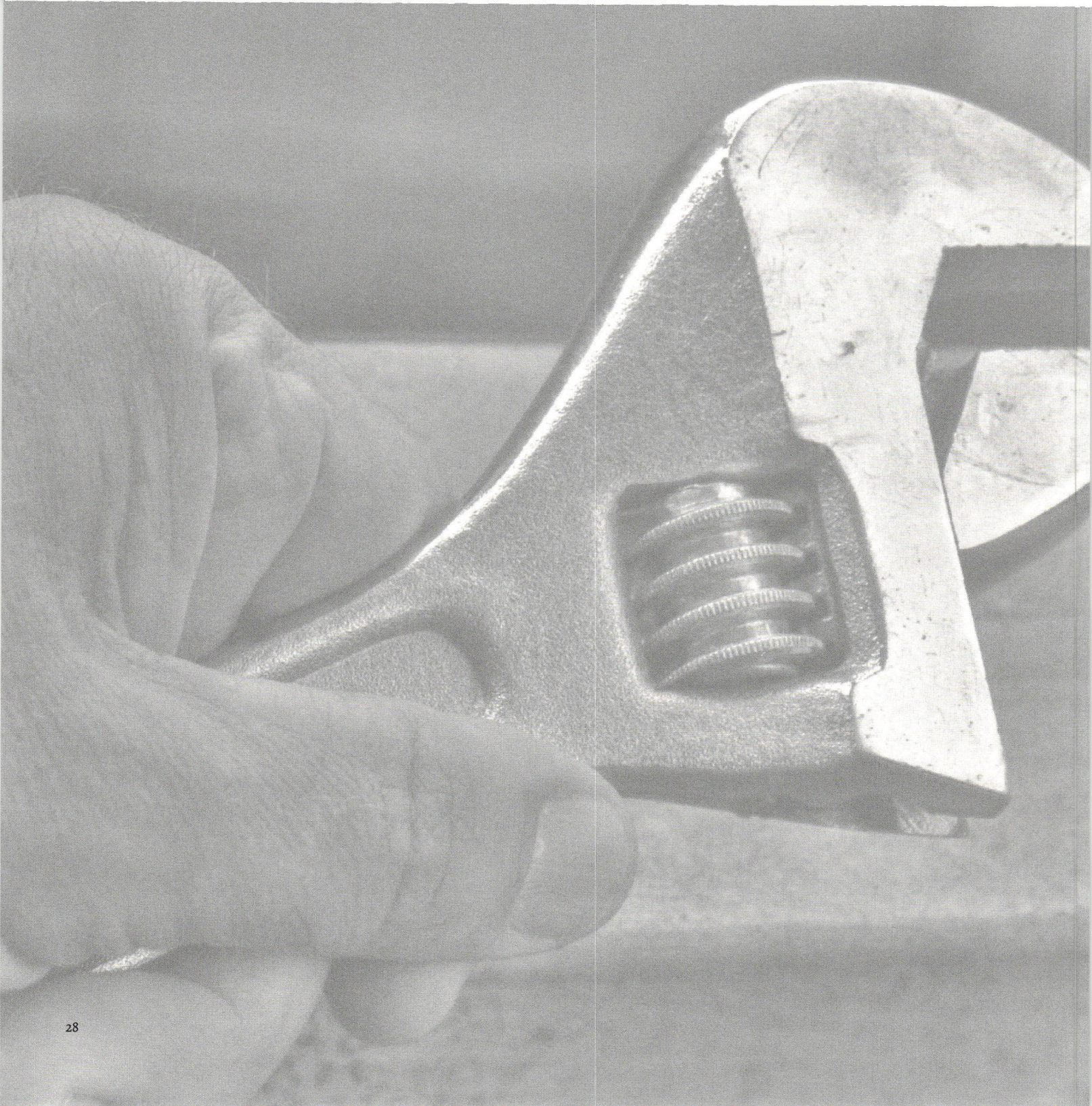
THE BIG IDEA

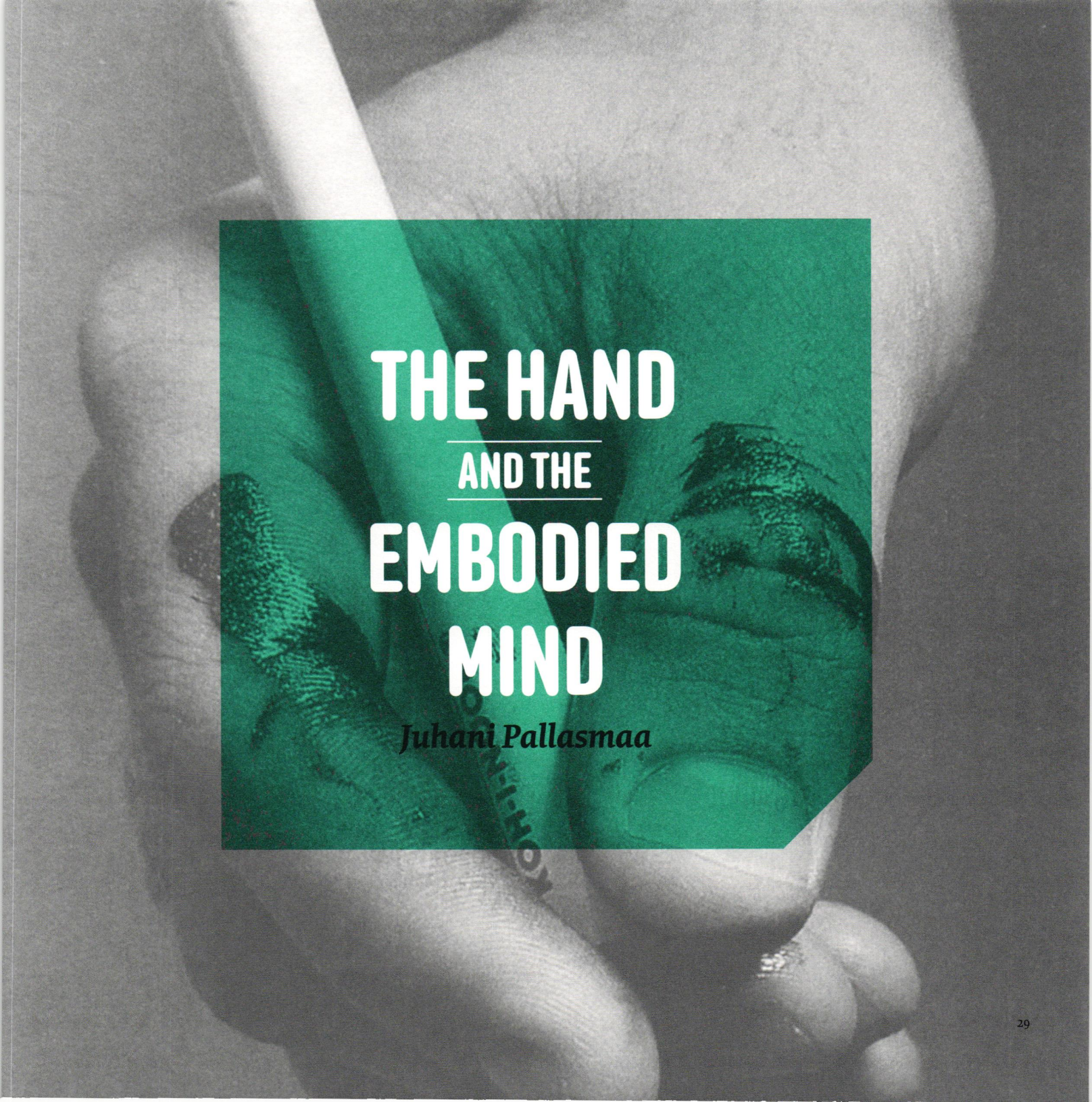
Walk [Your City] is an online, open source platform that will seamlessly integrate the different tools that we used to create the *Walk Raleigh* signs. This "website" will allow anyone with internet access to create their own walking signs in just a few clicks, auto-magically downloading a group of *Walk [Your City]* signs, "how-to's" and support materials (all for free!).

Walk [Your City] is a direct response to demand from other cities and organizations wanting to adapt and incorporate the campaign into their own city. Chattanooga, TN is adopting the signs at the end of April, Durham, NC over the summer and Hoboken, NJ has incorporated the project into their comprehensive city signage and wayfinding plan. There are a number of health and advocacy organizations that plan to help scale the project as well. Since the launch and successful funding of the Kickstarter project, a humbling amount of other cities and citizens alike have expressed their excitement about launching their own project via our platform.

WHAT DOES ALL THIS MEAN?

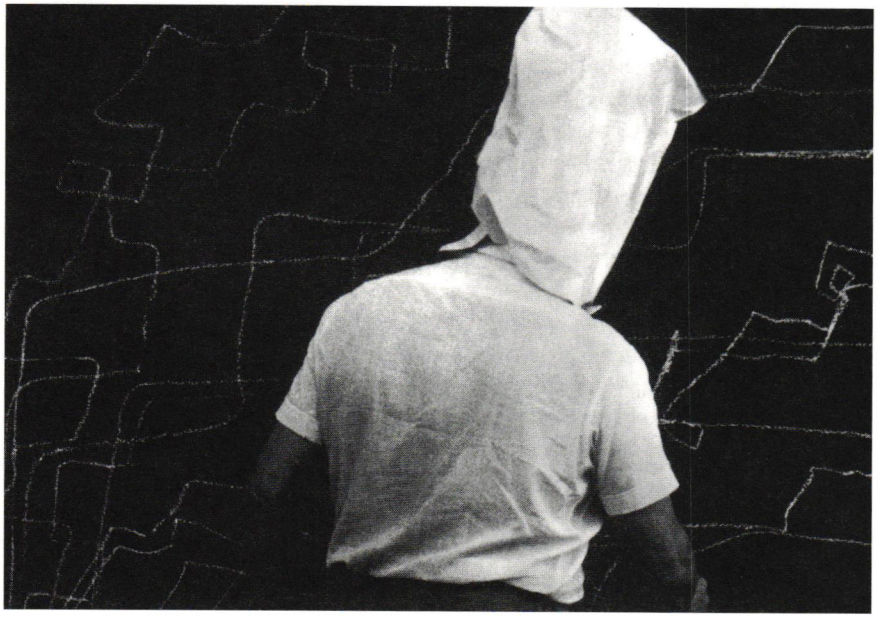
Opportunity is now. Literally, all barriers to entry in any industry have been lowered and anyone can take an idea to market and build a community around that idea.





THE HAND AND THE EMBODIED MIND

Juhani Pallasmaa



[*fig. 1*] Professor Aulis Blomstedt drawing on the blackboard at the Helsinki University of Technology with his eyes blinded by a bag, presumably in the early 1960s.

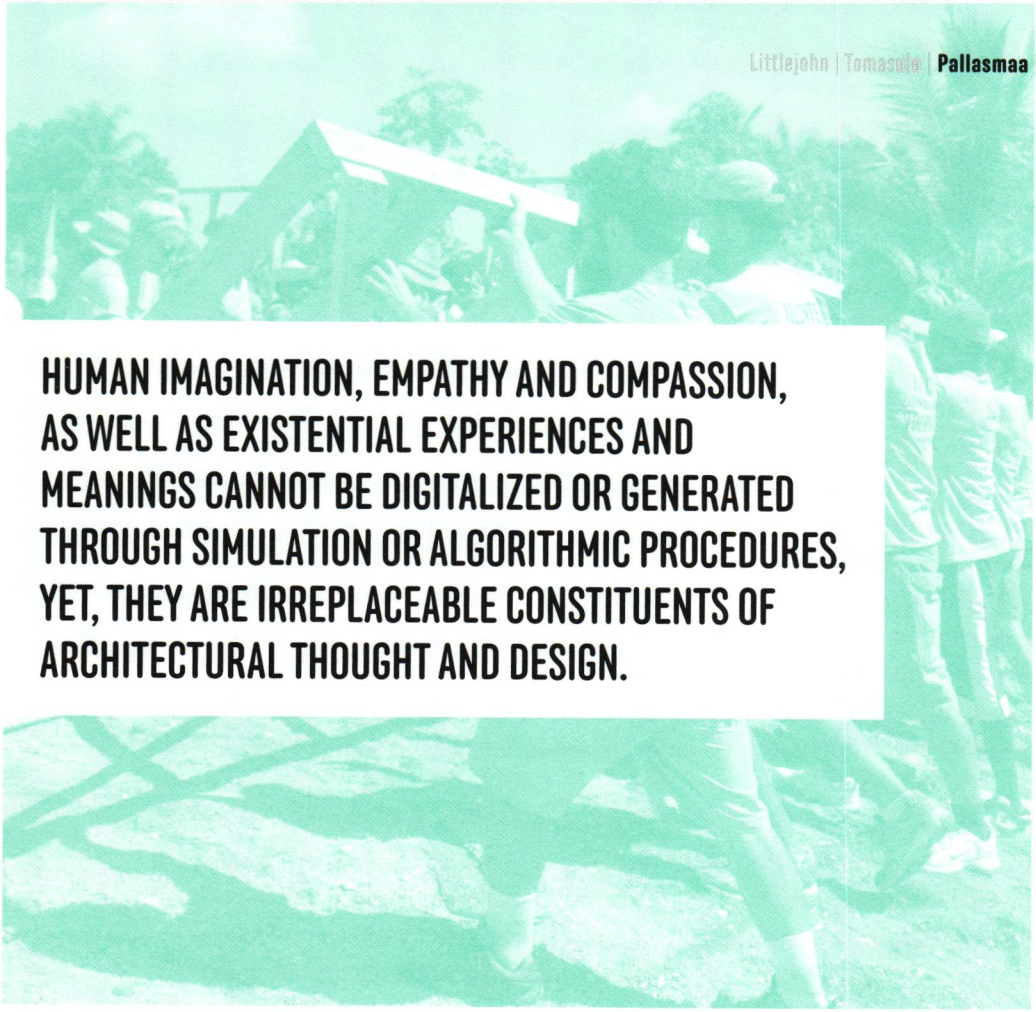
Pallasmaa delivered a lecture titled "Space, Place and Atmosphere – Peripheral Perception in Architecture" at NC State in January 2012 as part of the School of Architecture and AIA Triangle joint lecture series.

During the past century and half, the mechanized and automated processes of industrial manufacture have largely eliminated the presence of the human hand from our daily objects and settings of life. This gradual distancing from the embodied and tactile world of the hand has been heightened in the past few decades by the computerized methods of drawing, modelling and designing. This digital development is actually detaching the human processes of thinking and imagination from their essential connection with memory, body, and the sense of existence and self. The gradual accumulation of the built life-world historically took place in direct and concrete interaction with the processes of life, action and use, both collective and individual, but in our time cities for millions of inhabitants emerge through processes detached from the unity and integrity of lived experience and human work.

This concern of mine can be nonchalantly pushed aside by arguing enthusiastically that we have simply entered a truly modern society with its unforeseen and efficient methods of turning matter into form, objects, and dwellings of daily use. What is forgotten, however, is the fact that as biological beings we are products of tens of millions of years of evolutionary adaptation through constant interaction with the real-life world. With our technologies we are alienating ourselves from our biological historicity and essence. The most authoritative representative of the biophilic ethics, Edward O. Wilson, suggests: "All of man's troubles may well arise [...] from the fact that we do not know what we are and do not agree on what we want to become".[1] Our entire physical, and mental constitution, the singularity of the human being with its fabulous capabilities, the complexities of which we can so far only partially grasp, is the consequence of this unimaginably long biological process of hidden causalities.

Since ancient Greek philosophy, rationality has been regarded as the highest quality of *Homo sapiens*. The body, senses, emotions, and metabolic processes have been regarded as secondary aspects of human existence. Yet, recent philosophical investigations, as well as neurological theories and research, have shown that embodiment plays its

1. Edward O. Wilson, *Biophilia*, Harvard University Press, Cambridge, Mass. And London, England, 1984, 20. Here Wilson is actually referring to the view of Vercors (Jean Bruller 1902-91) in his book *You Shall Know Them* (1952).



HUMAN IMAGINATION, EMPATHY AND COMPASSION, AS WELL AS EXISTENTIAL EXPERIENCES AND MEANINGS CANNOT BE DIGITALIZED OR GENERATED THROUGH SIMULATION OR ALGORITHMIC PROCEDURES, YET, THEY ARE IRREPLACEABLE CONSTITUENTS OF ARCHITECTURAL THOUGHT AND DESIGN.

crucial role even in the most rational and conceptual aspects of our mental activities, and that all our reactions to the world are first immediate, preconscious and prereflective emotive responses. In fact, the entire notions of rationality and intelligence need fundamental re-evaluation; recent psychological studies suggest a dozen categories of intelligence besides the one measured by the standard IQ test.

To defend the significance of the hand in human work—labour, crafts, skills and art—is not only a nostalgic attachment to traditions; it is a question of defending our unique bio-cultural singularity and the essential and all-encompassing body-mind interaction. It is a matter of defending the very foundation of human creativity. Indeed, it is nothing less than defending our very humanity.

Dotin discusses technology's role in typography on page 41.

Magallanes reflects on drawing as a tool to understand and remember beginning on page 48.

Today's dispute of whether architects should draw by hand or using digital tools is pointless, in my view. Both approaches are surely needed, but we need to understand for which aspects of the often-complicated processes of thinking and design we should use them. Human imagination, empathy and compassion, as well as existential experiences and meanings cannot be digitalized or generated through simulation or algorithmic procedures, yet, they are irreplaceable constituents of architectural thought and design. Thinking and creative search are not merely capacities of the brain; they call for our total embodied and mental identification and existential wisdom.

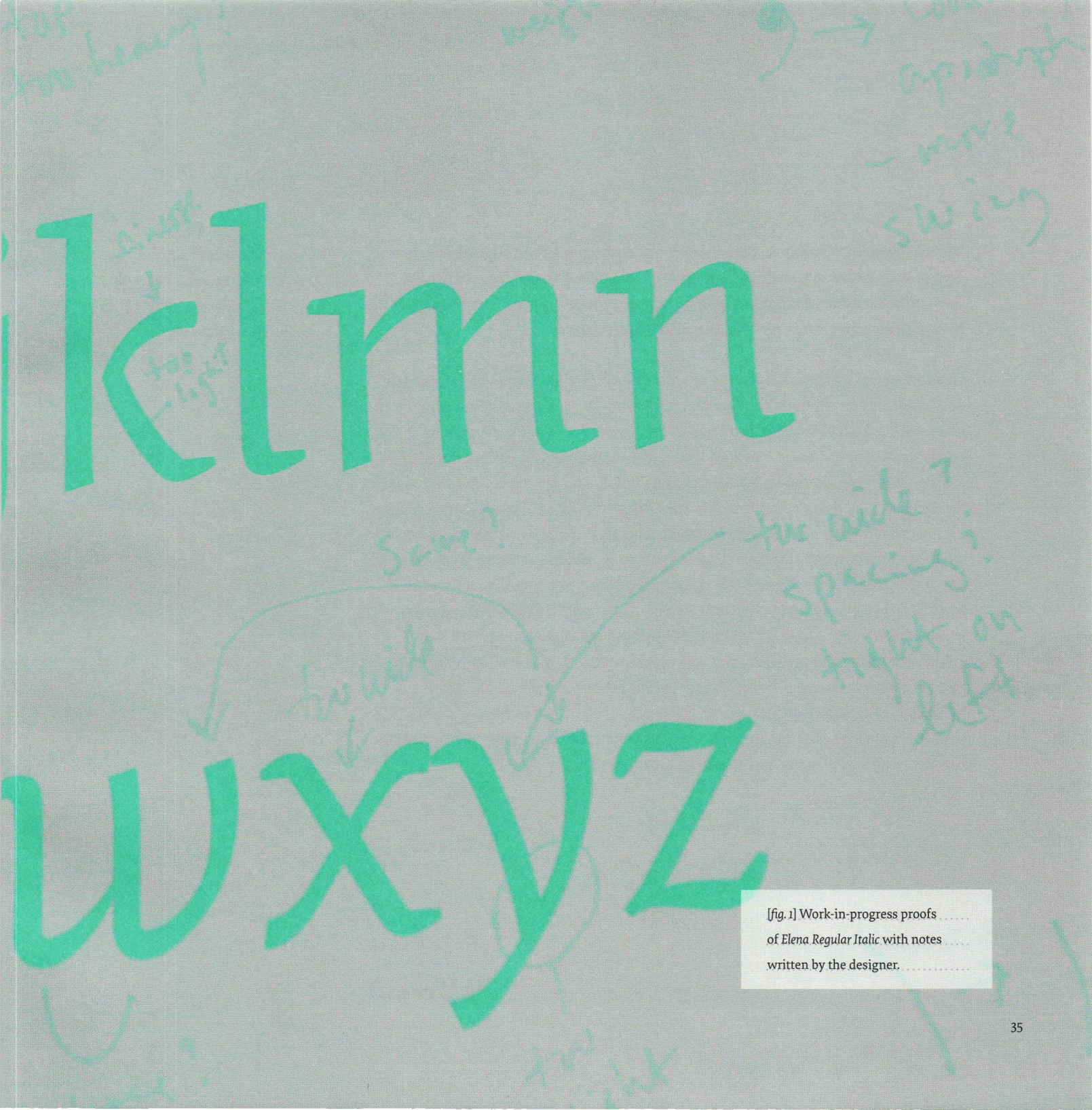
The defence of the integrity of the human constitution is the new collaborative ethical task of artists, philosophers and neuroscientists. It is thought provoking, indeed, that Semir Zeki, one of today's leading neurobiologists, makes the argument, "Most painters are also neurologists [...] they are those who have experimented upon and, without ever realizing it, understood something about the organization of the visual brain, though with techniques that are unique to them."[2] Qualified architects also need to be neurologists in the sense of understanding the complexities of our biological and mental interactions with the settings of our lives. Besides, we need to understand that in our own work, whether drawing, carving, modelling, designing or writing, we are engaged in these processes as complete embodied beings with our memories, desires, and dreams, not only as intellectual and rational beings. But this is the subject matter of my later book, *The Embodied Image: Imagination and Imagery in Architecture.*[3]

2. Semir Zeki, *Inner Vision: An Exploration of Art and the Brain*, Oxford University Press, Oxford, 1999, 1.

3. Juhani Pallasmaa, *The Embodied Image: Imagination and Imagery in Architecture*, John Wiley & Sons, London, 2001.

AN INTERVIEW WITH NICOLE DOTIN OF PROCESS TYPE FOUNDRY

Nicole Dotin



[*fig. 1*] Work-in-progress proofs of *Elena Regular Italic* with notes written by the designer.

TSP: You have had various creative roles—as a photographer, a graphic designer and now a type designer. How do you think these different roles have influenced your current thinking about typography and type design? How has your perception of form and design changed?

Dotin led a workshop for a graphic design studio at NC State and delivered a public lecture about the work of Process Type Foundry in Fall 2011.

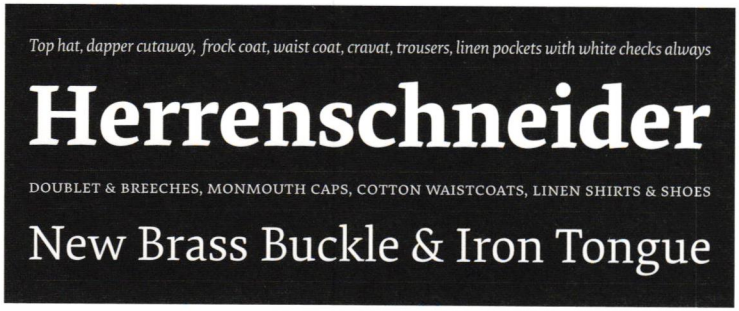
ND: In some ways, I think it's just the opposite. I've taken on those roles for a couple of reasons, but one of them is how I began my life as a designer. My first experience was creating a zine in college and I had nothing constraining my ideas about what design was or wasn't. I created almost all of the content as well as the graphic design, photography, editing, handled the zine's distribution, all of it—there were no distinctions for me between these activities. They were all part of a greater objective. So, my fundamental understanding of design became about goal-based decision making. In other words, that you have something in mind you'd like to achieve and you then make a series of decisions, consciously or not, to hopefully realize that objective. If you accept that process as design, there are few disciplines it doesn't touch. And when you take that to heart, the connections between activities are endless. Learning about one thing is learning about another as well. Approaching something new is less daunting because you've already developed a working methodology to draw from. Of course, you'll have to learn a lot new things, continually reassess and adjust your process, but it allows you to dive in without too much fear. Not knowing exactly what you're getting into doesn't hurt either.

TSP: We learn about typography and typographic design as communicating content (through readability and legibility), having formal characteristics (in the character and manipulation of the typography), and being expressive (in the connotations that typographic form carries). What is your perspective on the power of typography and typographic design through these lenses? Why do you think that it's important to continue to work in typographic design? Do you believe that type goes unnoticed? You have committed yourself to a field of design that oftentimes is taken for granted—what is your feeling about that?

ND: On a subconscious level, users of type are sensitive to its effects—from how it shapes their reading experience to how it changes their perception of goods and services. On a conscious level, however, the average person might not be keyed into why those things are happening or notice what the type is doing. That's probably less of a problem for the type designer as you suggest, and more of a problem for the reader who is experiencing the effects but not necessarily aware they are being manipulated (in the darker scenarios, anyways). For the most part, designers practicing typography don't take type for granted. If they did, they'd never purchase new typefaces! Culture is always rearranging itself. Our reading habits are always changing. We generally like to distinguish ourselves from one another. As long as those things remain the same, we'll want new typefaces to reflect our new circumstances.

TSP: You just designed your first typeface, *Elena*. Can you talk a bit about the process that you went through to design it, specifically if you think your process designing type might be different from other type designer's processes? Has your transition and past experiences contributed to these differences?

ND: It's hard to say. I don't think there is anything particularly unusual about my background or the process I go through to make typefaces. If I remove myself from the equation to answer your question—do I think you can pinpoint, from a process standpoint, why one designer is mediocre and one is good? Yes. There are certainly methodologies that produce better work. But between the good designer and the one who achieves extraordinary excellence? That's a more challenging question with a more complicated answer. Everything about a designer matters, from how they learned their craft to their cultural background to individual quirks. It's not a predetermined set of steps that creates excellent work but rather the sum total of a person. Why is it that Dieter Rams or Zaha Hadid or Adrian Frutiger produced great designs? I really can't answer fully, but I know it's not simply because they practiced their craft really well or made sure to research the market. Their view of design, how adaptable or rigid their ideas, their motivations, their level of persistence or prior experiences, their ability to self-reflect or how they take in the world around them...it all plays a factor. So, I guess my answer to your question is: 'I hope,' and, 'yes.'



[fig. 2] Type specimen of *Elena*.

TSP: In your presentation at NCSU during the fall of 2011, you mentioned the difference between economic models of service-based versus product-based design work. How does this influence the way that Process Type Foundry operates and your particular role as both a designer and business owner?

ND: There are a number ways to earn a living as a designer, but there are two main avenues in typeface design: selling design services to clients or selling products to customers. Of course, most designers do varying proportions of each. For example, we engage in some service-based design work like creating custom fonts for clients, but we primarily sell the typefaces we've made to the general public. Without a client, it's solely up to us to figure out what sort of type to work on next. One result of that could be that our upcoming releases are based on an overview of the existing market and a calculation of what is missing, current or in demand; in other words, we would design only what we think would sell. Our actual process is much messier. We look, collect, think, get excited about something, draw a couple of letters, go back to the drawing board, think some more, look some more and start a couple more letters until we arrive somewhere. To add to that idea, since we put so much effort into the typefaces we produce, we become extremely invested in how they're then marketed and released into the world. When these two philosophies collide, the side effect is a product-based business. Of course, on a practical level it means we spend a good deal of time marketing the foundry and providing support to our customers, for example, and less time dedicated to type design alone. It is worth it in the end, however, to be able to shepherd a typeface all the way from a spark of an idea to its final destination as a typographic tool.

OUR ACTUAL PROCESS IS MUCH MESSIER.
WE LOOK, COLLECT, THINK, GET EXCITED ABOUT SOMETHING, DRAW A COUPLE OF LETTERS, GO BACK TO THE DRAWING BOARD, THINK SOME MORE, LOOK SOME MORE AND START A COUPLE MORE LETTERS UNTIL WE ARRIVE SOMEWHERE.

[*fig. 3*] Years worth of proofing the typeface on paper piles up.

TSP: Digital type design in the 90s created a proliferation of new, digital typefaces that significantly changed how type is designed and produced, and had profound impact on graphic design. Do you think this influx was good for design? What do you think future methods of type design might be and how do you think technology will influence them?

Littlejohn acknowledges the computer's role as a tool and communication platform for designers on page 18.

ND: The advent of personal computing was certainly an important event. But when you add in the invention of the Internet and then move on down the road to easily accessible sales outlets for fonts, you really begin to see an influx of typefaces—which brings us squarely to the present. This certainly has made the field of type design crowded and the competition for attention has increased. In my opinion, it's not necessarily an issue that *more* is happening—more graphic and web designers in the field, more type designers, more typefaces on the market, etc.—but our ability to adapt successfully to the changes. I think we've done okay, but I also think we can do better (and the question is too large to fully answer here).

As for future methods of type design, the way type has been produced has changed relatively consistently since the 1900s. Page through a design magazine from the 70s and you'll find advertisements for all sorts of long-dead type technology rendered completely useless by a successive advancement. It all leaves its mark but technology, as it relates to the production of typefaces, is a fleeting thing. Here one day, irrelevant the next. In the big picture, good ideas and good design survive. Technology is just the means to an end—it's what we decide to do with it that matters.

NEUROSCIENCE AND ARCHITECTURE

THE NEXT GENERATION OF DESIGN

Eve Edelstein, PhD

Edelstein presented to NC State College of Design students and faculty in Fall 2011 about her research involving both neuroscience and architecture.

Our profession is positioned at an unusual moment, when our recently trained designers stand ready to lead a new process of design inquiry. As academic silos erode, students seeking an interdisciplinary approach to design thinking are applying a broad range of technologies to measure the impact of design on human outcomes, including wearable wireless biosensors and global positioning monitors. Graduates who develop their design visualization skills while immersed in full-scale 4D computer simulations test the influence of design more rapidly than can be done by pen in traditional plan and elevation, or in built mockups. It is at this very moment, when economic pressures have reduced staff in many firms, that interns and young professionals may demonstrate the value of such skills, as they stand closer to the shoulders of their leaders. Add the entrepreneurial workplace of the internet, and our recently trained designers are poised to transform the process of design itself.

Yet, the integration of human studies with design has a rich history in architecture. Imhotep and Leonardo daVinci were masters of both architecture and the study of the human body, and Marcus Vitruvius Pollio explored the interaction between form and human function in the *Ten Books on Architecture*. Recent developments in the field of neuroscience now offer deeper insights to the influence of design on mind and body. With the development of electrophysiological and imaging systems, we can now 'see' how the form and function of the brain relate, and how interaction with the built environment influences behavior and the experience of design.

White's architectural work is also informed by research in other areas, particularly food systems, beginning on page 54.

The AIA and the College of Fellows supported the creation of the Academy of Neuroscience for Architecture to explore how rigorous neuroscience may be applied in design. With the NewSchool of Architecture & Design, a curriculum has developed that introduces students to a more rigorous design research that includes the scientific method and translates biomedical research into design principles. In collaboration with the University of California San Diego, students evaluate real projects in full-scale, 3D models in a controlled design lab in the virtual reality CAVE at Calit2.

[*fig. 1*] Dr. Edelstein stands within the virtual reality StarCAVE at Calit2, University of California, San Diego. Full-scale 3D models are viewed from a first-person perspective, allowing designers to analyze sight-lines and views with greater accuracy, while head-tracking is used to evaluate circulation. The synchronous measurement of EEG brainwaves tracks wayfinding and visual attention to design details.

A desire to understand the human response to the environment, and a delight in integrative thinking, is reflected in my journey from the study of anthropology at University California, Berkeley, to doctoral research in clinical neuroscience at the University College London, and clinical practice at the National Hospital for Neurology and Neurosurgery, London. A professional Master of Architecture degree from the NewSchool of Architecture & Design, enables me to 'close the loop,' exploring how buildings influence the brain, body and mind.

Focused on research-based design, I work with clients, designers, architects and researchers, including a deep and broad history of design inquiry that looks to the writings of Piaget and, Gibson and James from psychology, as well as 100 years of recent study in the neurosciences and medicine.

We apply holistic and reductionist thought, explore the intuitive and the objective; and then we leap. We leap from critical analysis of research results to translate findings into meaningful design principles that architects and designers may apply.

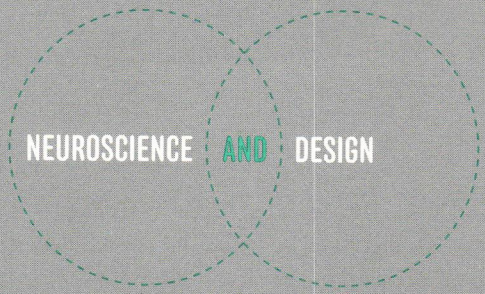
Workshops hosted by the Academy Of Neuroscience for Architecture brought together practitioners, theoreticians and neuroscientists to explore how our disciplines may collide to inform and enhance the design of healthcare, educational, justice, spiritual, and laboratory facilities. Our colleagues in healthcare led the charge, as leaders in evidence-based design, and flanked by hospital boards and administrators comprised of MDs, PhDs and MBAs, they challenged us to "show me the evidence." With healthy skepticism, they asked us to "measure up," and validate our claims.

Thus, the integration of the scientific method of enquiry, technologies that measure the human and the environment at the scale of a design feature, has been developed to create what I call a 'neuro-architectural process.' Best begun at the initiation of a project, the interaction between sensory, motor, hormonal, cognitive and emotional responses are translated into design principles to inform design features that serve building functions for the individual, group, public, and social context.

Although many distinguish between the brain and the mind, I allow them to 'sit in the same place.' If we combine our disciplines—integrating phenomenology, psychology, and neuroscience—and if 80% of our findings are consistent, then we have stronger evidence to support design decisions. Thus, one can use both a reductionist, scientific and objective approach to measure the impact of design, without forgetting the phenomenological effects of architecture.

Architects have asked, "Are you telling me how to design based on a heart-wave?" The answer is, "No." But I do believe that we can gain important insights about the human response to design by picking up a new set of tools. Instruments from medicine and sciences that measure the brain and body's response to buildings.

Our goal is to understand both the affect and effect of design.



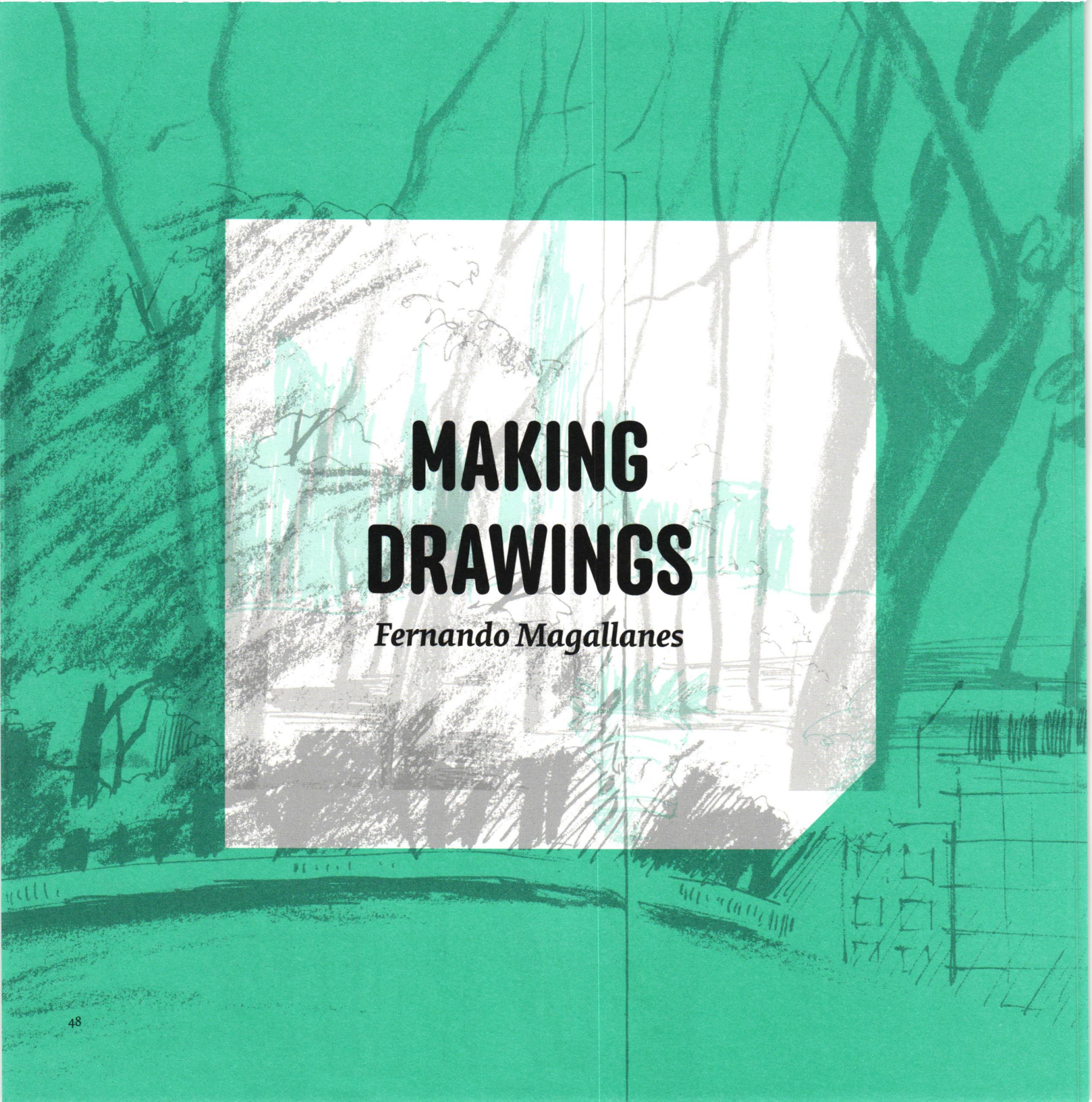
If we combine our disciplines—integrating phenomenology, psychology, and neuroscience—and if 80% of our findings are consistent, then we have stronger evidence to support design decisions.

Appropriately, a great deal of attention has been afforded to building performance and sustainable criteria. Designers, architects and builders strive to achieve the highest level of certification in concern for the environment. However, research in human factors and sick building syndromes is often overlooked. Greater concern and aspiration needs to be developed for building performance metrics that include human users and outcomes measured in terms of human function, wellbeing and health. Using emerging technology to measure user responses, guidelines that parallel the green initiative is called for.

Rigorous research may continue to inform sustainable guidelines to assess and minimize the risks from exposure to pollutants or infectious agents in air, water, and materials. Reduction in exposure to neurotoxins, pollutants and harmful byproducts of the building profession and industrial processes, may be served by the fusion of architectural, scientific and medical knowledge to accelerate the development of sustainable objectives that enhance human experience, performance, and health outcomes. Recent developments in biosensor technology and wireless communication, global positioning and wearable monitoring devices may now be used to assay the exposure to the design and the environment in both virtual and real built environments.

Architects and their clients increasingly ask for rigorous and trustworthy data to support their design decisions. The application of new approaches at the interface between neuroscience and architecture provides rigorous data to put the "evidence" in evidence-based design. Evidence of the impact of humans on their environment, may thus be complemented by studies of the reverse, the influence of the built environment on its inhabitants.

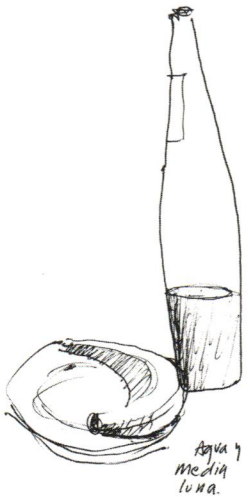
Ultimately, our goal must be to inform design that serves the human condition, from birth to death, and the most fragile as well as the most gifted.



MAKING DRAWINGS

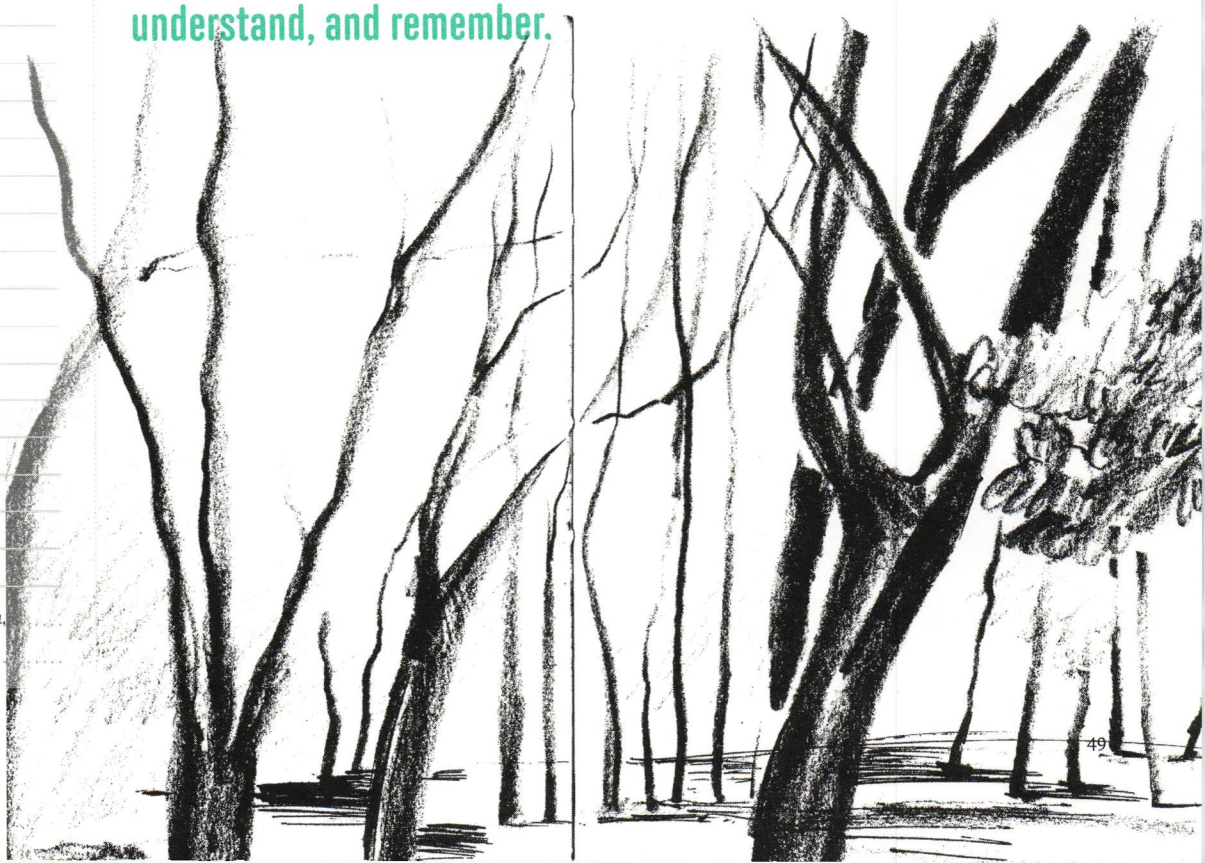
Fernando Magallanes

Magallanes is an Associate Professor of Landscape Architecture at NC State and teaches in the First Year Experience program.



[fig. 1] Agua y media luna. 2011

When I step into places I have never been to before, I have to reach for a pen and into my mind to make sense of things. As a designer, I draw to help me see, understand, and remember.

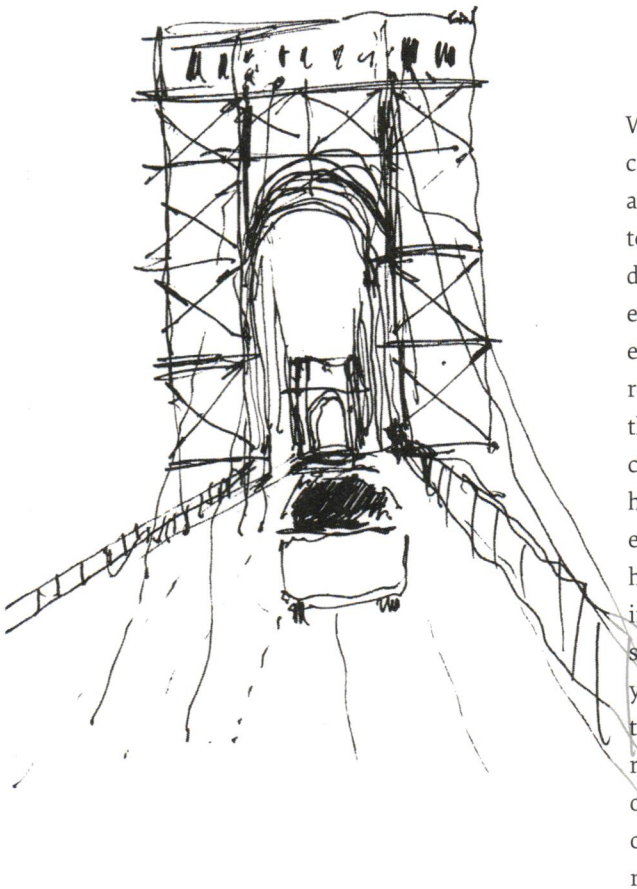


[fig. 2] Trees: Parque San Martin. Buenos Aires, Argentina. 2011

I have discovered in my readings and my travels that existing landscapes and places afford us information. How do I access that information? Making drawings provides a tool for acquiring information and augments the sense of adventure for knowledge about the environment I want to study. Drawing drives my questions for gaining insight into the place. To get at usable information out of a place I find that I must observe, I must sketch, and I must critically engage the place. The more I sketch, the more informed I am about the identity and the essential nature of the world I inhabit and I am studying.

Pallasmaa discusses the necessity of embodied experiences for designers beginning on page 28.

[fig. 3] Trees and Slope: Parque San Martin. Buenos Aires, Argentina. 2011



[fig. 4] *George Washington Bridge, New York City*. 2009

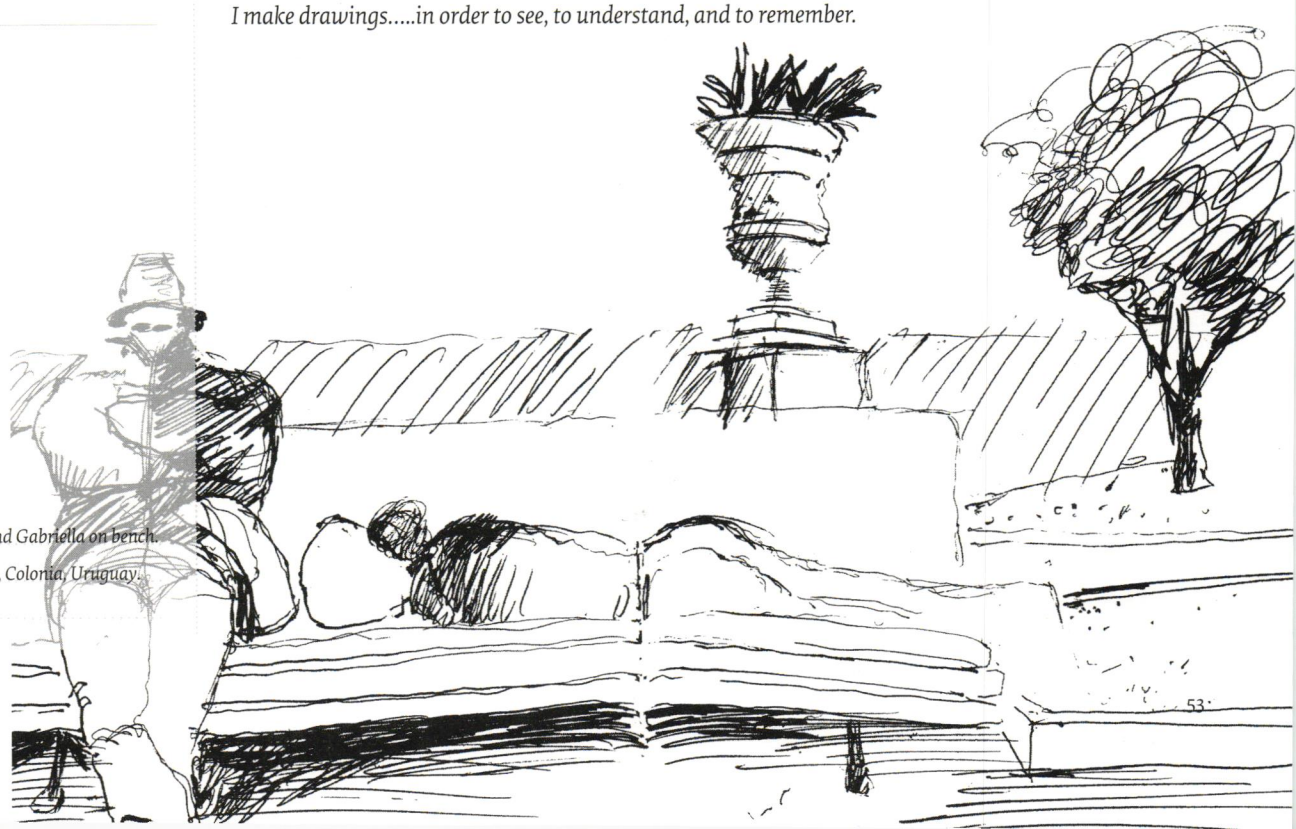
What is observed and drawn becomes the content for critical deliberation between the drawing, the place, and my perceptions. The act of making a drawing leads to seeing, questioning, recording and enhancing the drawer's experiential knowledge through the drawing of existing situations and phenomena. Bits of information emerge as I draw images, diagrams, abstractions, and representations. The drawings release information about the properties of the place or thing that I am drawing that can be categorized around such topics as human history, historic transformations, landscape interventions, design elements, natural phenomena, architecture, space, and human use. Through the use of *field sketching* there is an inevitable illumination that occurs. *Field sketching* is a specific type of drawing technique that is a few hundred years old, whose value derives from not being created in the studio or lab but ***in the field***. Both artists and scientists regard use of this type of drawing as an accepted method of study. It straddles both art and science in its ability to offer knowledge about the world through critically recorded observations of life, culture, and nature.

What is observed and drawn becomes the content for critical deliberation between the drawing, the place, and my perceptions.

[fig. 5] *New York City Skyline*. 2009

Many of my drawings are undertaken when I travel when I am able to encounter new places to study. I use a simple bound 5" x 8" sketchbook, colored pencils, and ink pens. For me, field sketching is a two-step process. First, I establish a focused route of study and a time limit for observation and sketching. I sometimes sketch from buses and planes that contain you and establish your study time and your path, but on freer walks, the route and time is self-imposed. I use 2 or 3-hour increments for my walks and focused studies. Second, I develop drawings (analytical, notational, or representational) that help interpret what exists to allow the emergence of new imagery. Through these drawings I find there is a 'revealing' or identification of something discovered—a pattern, a phenomenon, or a thought that leads to your knowledge of that place.

I make drawings.....in order to see, to understand, and to remember.



[*fig. 6*] *Trinidad and Gabriella on bench. Plaza 25 de Agosto, Colonia, Uruguay.* 2011

THE ARCHITECT AND THE LOCAL FOOD SYSTEM

Erin White

method:

(in parallel development)

geographical investigation of existing food networks;

research into local food system mechanics;

conscious evolution of self-reflexive working method;

development of intervention

The final project for my Masters of Architecture degree proposed reimagining the role of the architect and methods of architectural work. Architectural practice, I argued, ought to extend from the building outwards to include the system; ought to extend to the programming of system interventions; ought to extend to and internalize socio-cultural implications, ecological responsibility, and community-based solutions. By moving upstream in the design process and becoming a collaborative partner in strategy and development, architects may discover applications of their thinking and problem solving skills that demand re-evaluation of traditional methodologies.

The lens I chose to test this proposition was the local food system *(fig. 1)*.

White received a Master of Architecture degree from NC State in December 2011.

Littlejohn cites understanding processes and systems as a new consideration for designers on page 18.

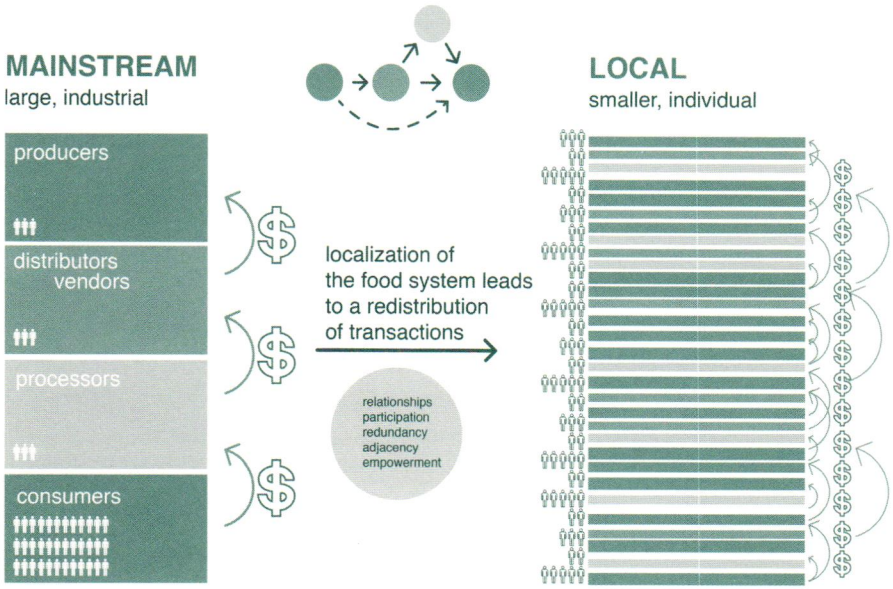
[fig. 1] Simplified food system diagram, emphasizing consumer food services.

Discussions of food are composed of numerous issues, across many scales, into a variety of identifiable, inter-related systems. Global, local, community, organic—these are ways to imagine systems that include all aspects of food, from growing and distribution to processing, selling, and consuming. Discussions of local food represent an effort in focusing, and an effort to relocate ideas of food production and distribution from a global, placeless food system to a local, visible, tangible one in order to create a healthy food system that is community based. Discussions of local food necessarily imply the presence of the global system that it exists alongside or actively subverts.

The issues and opportunities found in local food systems are diverse and complex. The study of local food systems includes physical, economic, social, environmental, and cultural interaction; among these interrelated areas are territories of wicked problems appropriate to the testing of my proposition for architectural design extension.

The choice of a problem is, I believe, the key to unlocking the potential of architectural design. The problem of local food allows the architect to be the 'Architect,' and also offers opportunity for the architect to be collaborator, mapmaker, gardener, schemer and speculator. In each turn, the architect may find new agency and thus a new voice. In my own experience I have not been as comfortable in any role as I have as a building designer, but comfort is not the point.

In the same spirit, I selected a geographical range for study that pushed me from my comfort zone. I focused on chronically poor urban areas of Durham, NC—neighborhoods I'm an outsider to—as a way to challenge my preconceptions about culture and behavior. My actions in these neighborhoods would demand accountability and sensitivities to local conditions and needs. In study of these neighborhoods, I conceived of the local food system as a multifaceted urban revitalization tool that can build economic, cultural, social, and environmental stability *(fig. 2)*.

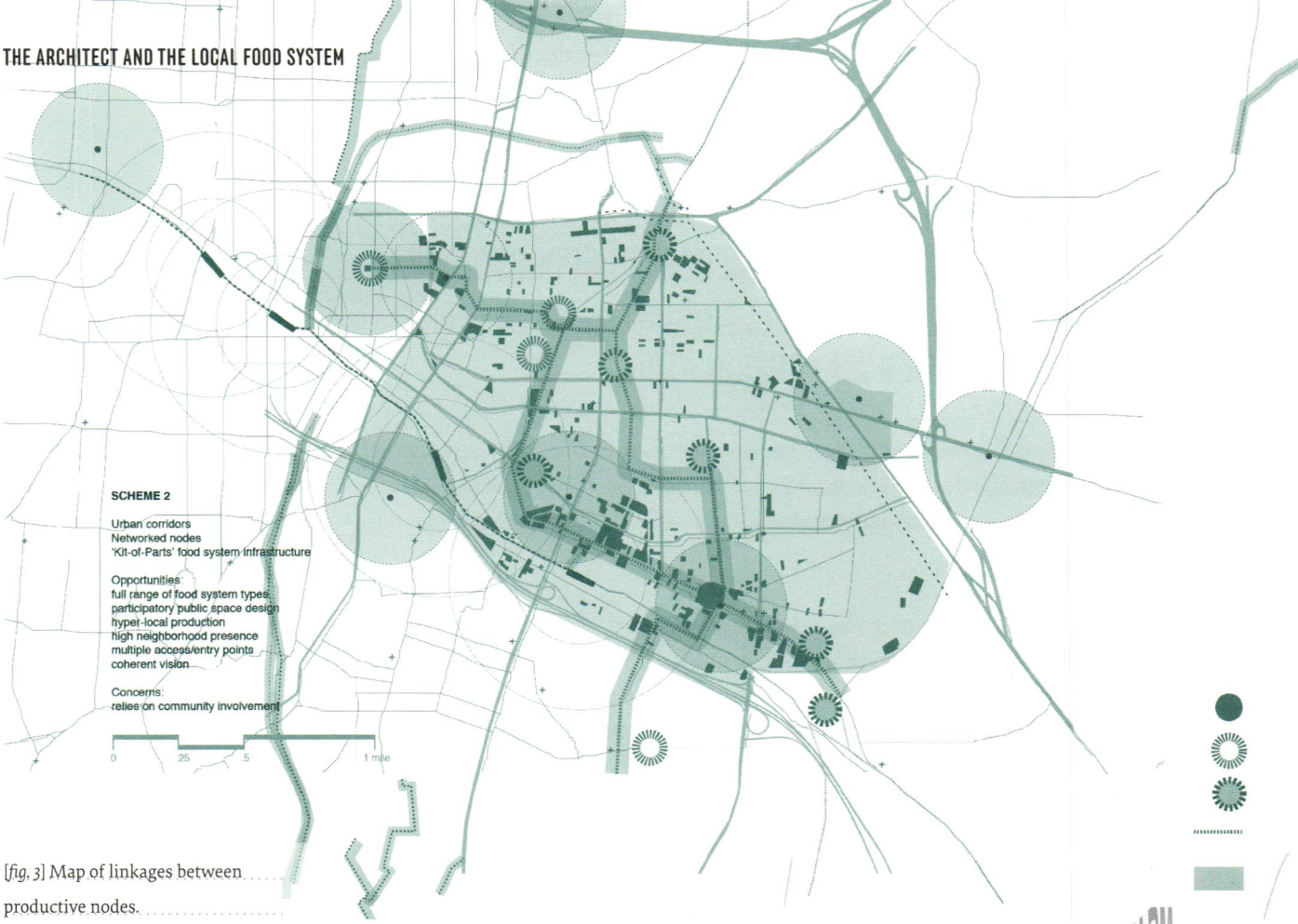


[fig. 2] Local food system as a revitalization tool.

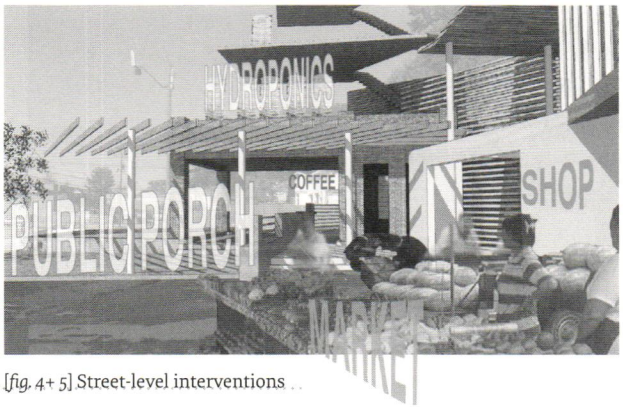
In the two square mile study area of low-income neighborhoods, I identified numerous sites for speculation on strategies and tactics for bringing positive change to the food system, and thus to the neighborhoods. At the urban level, I explored conceptual models of expressive linkages between productive nodes *(fig. 3)*. At the site level, I focused on developing context-driven programs that related directly back to the urban systems, with the intention of creating bidirectional intelligence between street-level interventions and the needs of the city *(fig. 4 and 5)*. At the policy level, possibilities were explored that encouraged participation in local food, and that related food access to public health, economic development, and education.

While my project could be seen as the creation of these various speculations and the real-world work that has emerged from them, much more important in my project is the method itself, a continuous rebalancing of three territories of action: productive, analytical, and reflective. These territories combined and re-combined over the course of the project and in the end revealed a methodology for design inquiry that I hope to replicate in future projects.

Productive action included the development of maps, the development of prototype interventions, and the development of systems solutions. Through this production



[*fig. 3*] Map of linkages between productive nodes.



[*fig. 4+ 5*] Street-level interventions and needs of the city.

THE PROBLEM OF LOCAL FOOD ALLOWS THE ARCHITECT TO BE THE 'ARCHITECT,' AND ALSO OFFERS OPPORTUNITY FOR THE ARCHITECT TO BE COLLABORATOR, MAPMAKER, GARDENER, SCHEMER AND SPECULATOR.

a body of ideas was generated for discussion and evaluation. In this thread of work one finds an iterative design process: read, make, evaluate, and repeat. The making portion of productive work allows idea to find physical form, a translation essential to design.

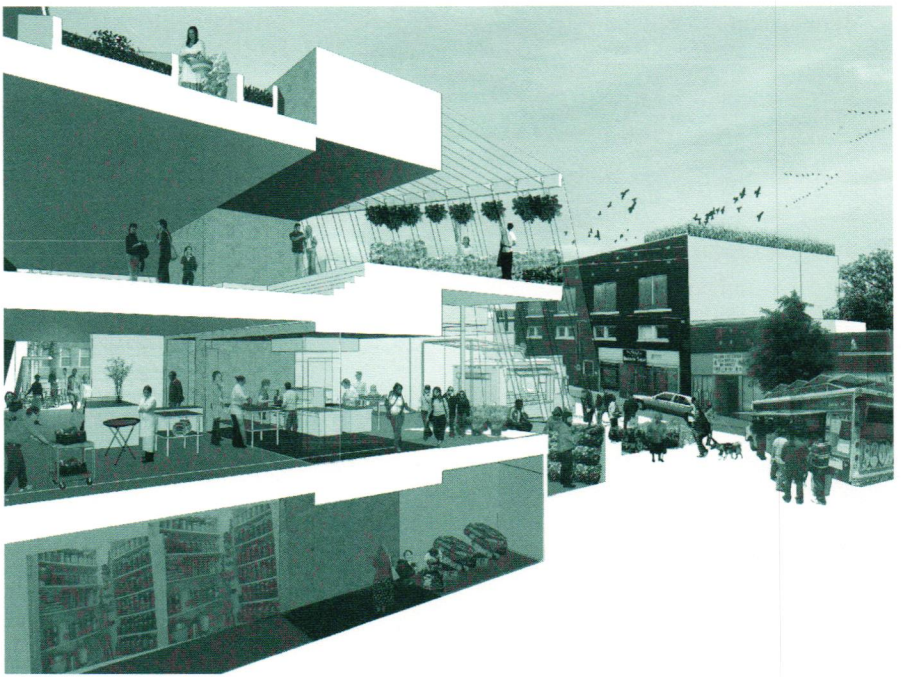
Analytical action worked simultaneously to provide material for the productive actions and to test the outcomes of them. Research into food systems, neighborhood networks, and geographic relationships at multiple scales provided data for the productive speculation on form and space. Often, the forms generated included assumptions and further questions and opportunities in the workings of local food. Analytical action in tandem with productive action deepened the iterative cycle and pushed my making into unforeseen openings.

The reflective action carried out alongside these other areas of action was a conscious pattern written into the DNA of my study. My intention was to shy away from certainty, to be suspicious of the obvious answer. At any point I let myself reconsider method, asking question after question about tactic, about proposal, about relationship of top-down and bottom-up, relationship of research question to site intervention. Method of productive and analytical action varied from iteration to iteration, itself subject to dissection and study and change. Intrinsic to my method of work was reflective adjustment of the method of work.

In combination these three territories of action grew loose and intangible, requiring certain specific reference points to hold them together. My research question provided the first of these: *How can architectural design strategies strengthen community food system initiatives and interventions?*

As my work moved forward, additional reference points were added, typically as ways to narrow action and scope. Identification of my study neighborhood tightened my geographic range. Creation of an urban model helped sort urban data into categories of resources. The decision to test design interventions using street-level views resulted in extensive use of the experiential representation as both presentation and critical analysis tool.

Throughout the project, I found both a narrowing of scope and an expansion of possibility (*fig. 6*). This dynamic is one that I hope to replicate and refine. In its essence, this method is one of design speculation, unencumbered by disciplinary constraints. As a methodology for development of interdisciplinary design projects in emerging markets, I am excited about its possibility.



[*fig. 6*] Rendering of architectural and street interventions.

PRO-CESS 13

Casey Reas

One of Reas' digital prints was included in the exhibition Deep Surface: Contemporary Ornament and Pattern *at the Contemporary Art Museum in Raleigh from September 2011 to January 2012.*

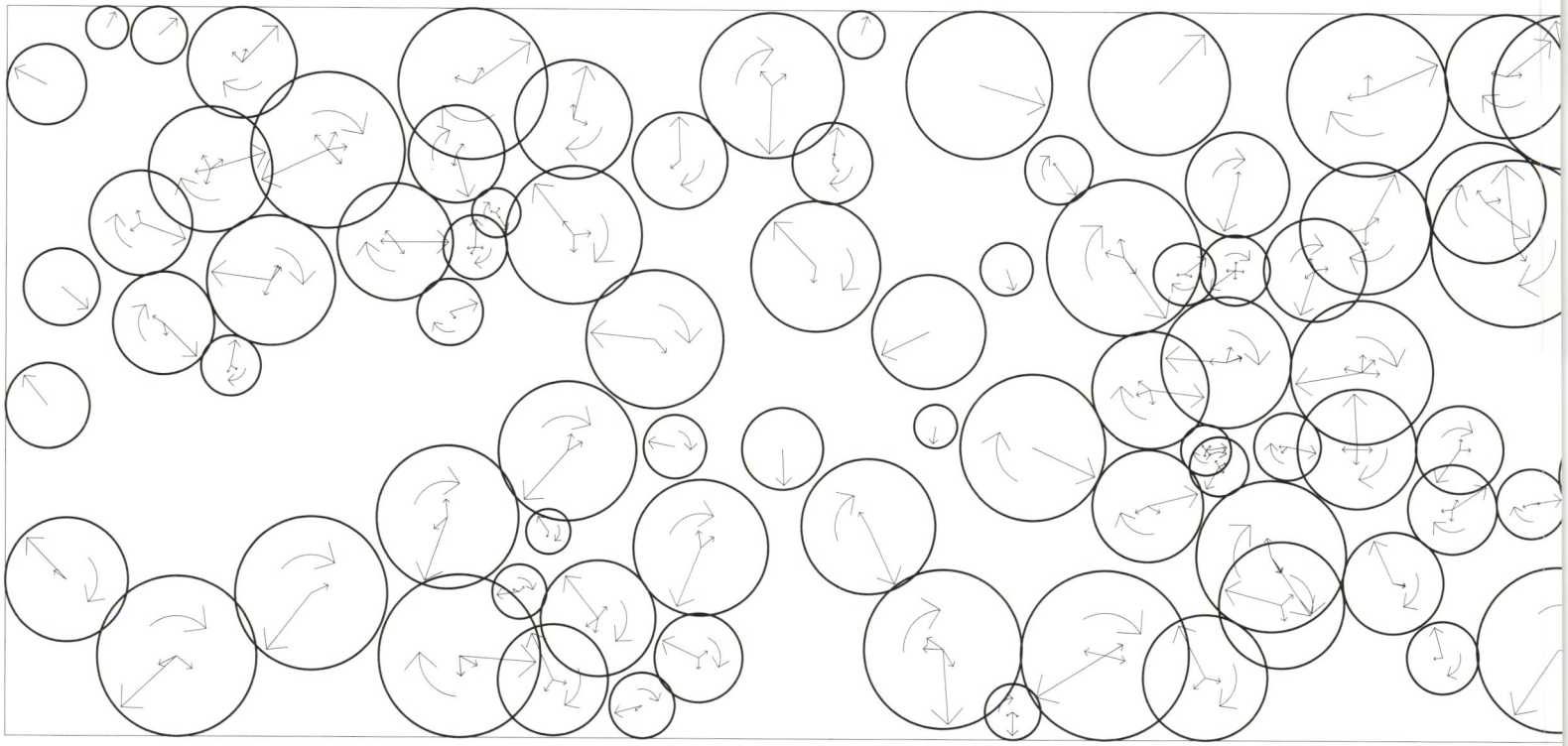
An Element is a simple machine that is comprised of a Form and one or more Behaviors. A Process defines an environment for Elements and determines how the relationships between the Elements are visualized. Each Process is a short text that defines a space to explore through multiple interpretations. For instance, this is the text for *Process 13*:

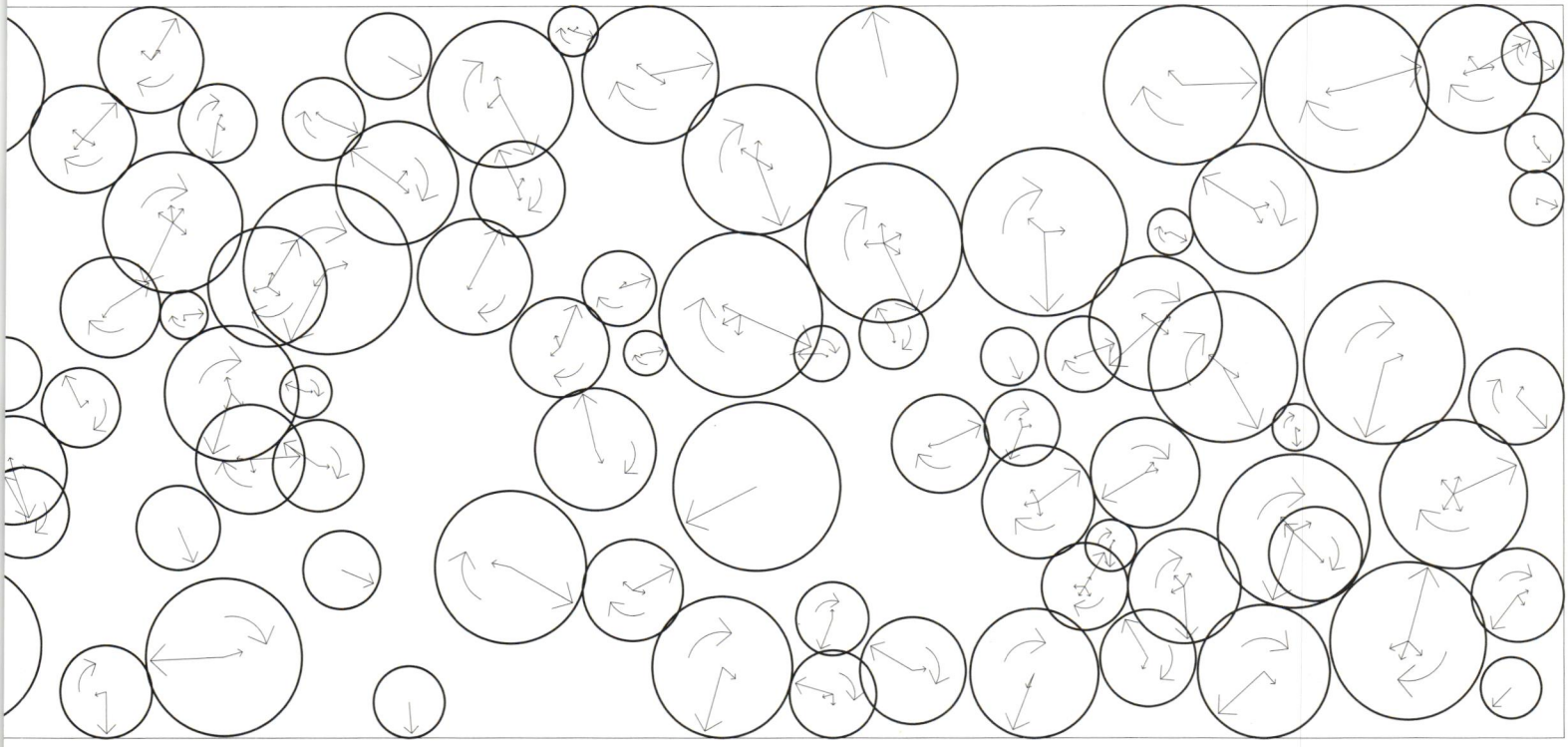
> Bisect a rectangular surface and define the dividing line as the origin for a large group of Element 1. When each Element moves beyond the surface, move its position back to the origin. Draw a line from the centers of Elements that are touching. Set the value of the shortest possible line to black and the longest to white, with varying grays representing values in between.

A Process interpretation in software is a kinetic drawing machine with a beginning but no defined end. It proceeds one step at a time, and at each discrete step, every Element modifies itself according to its behaviors. The corresponding visual forms emerge as the Elements change; each adjustment adds to the previously drawn shapes.

Dotin states that what we do with technology, not technology itself, is what matters on page 41.

During the last seven years, I have continuously refined the system of Forms, Behaviors, Elements, and Processes. The phenomenon of emergence is the core of the exploration and each artwork builds on previous works and informs the next. The system is idiosyncratic and pseudo-scientific, containing references ranging from the history of mathematics to the generation of artificial life.





ELEMENT 1

Form 1: Circle

Behavior 1: Move in a straight line

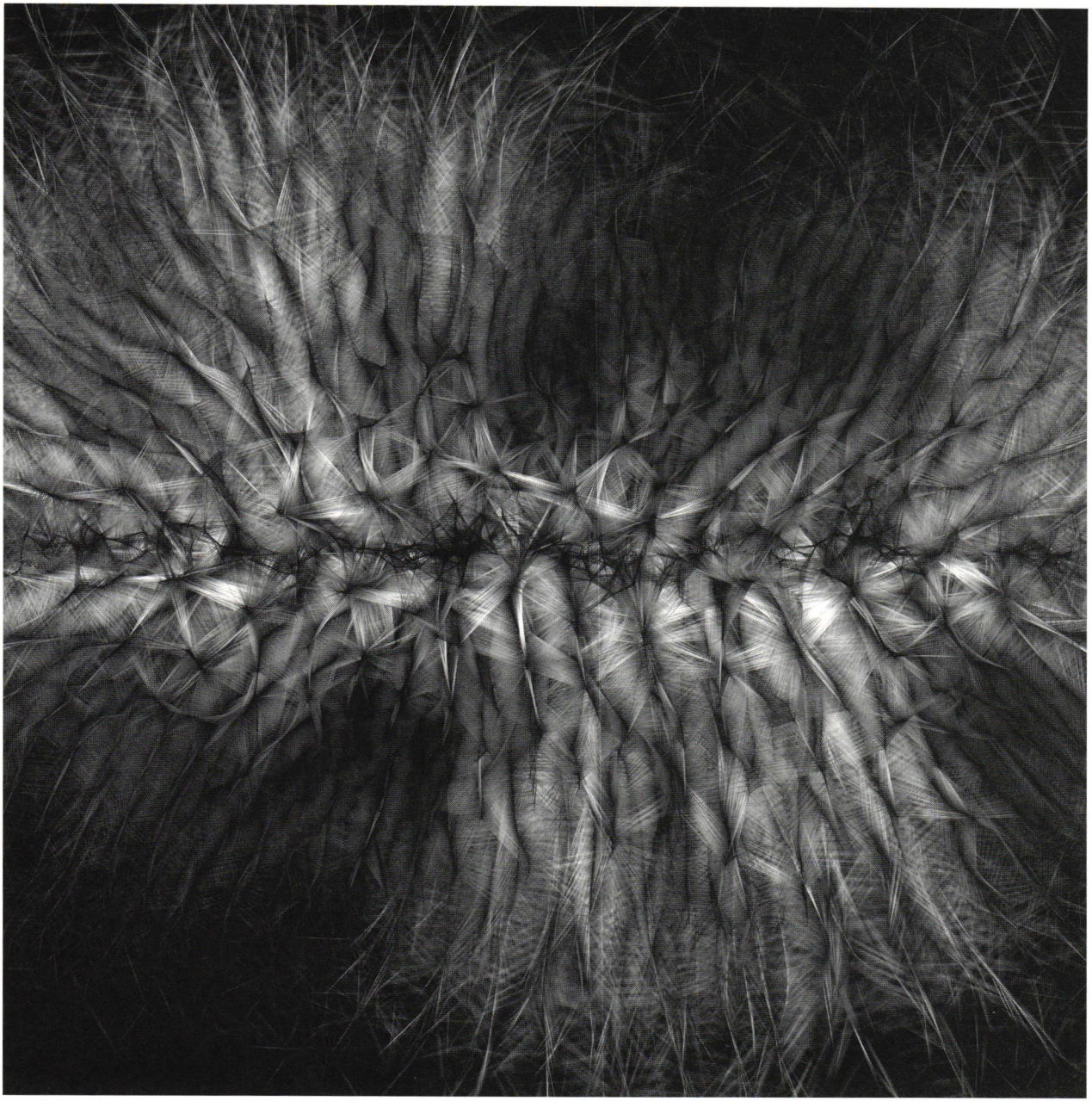
Behavior 2: Constrain to surface

Behavior 3: Change direction while touching another Element

Behavior 4: Move away from an overlapping Element

TSP: What does code enable in your own work, and for designers in general?

CR: Computers are advanced tools; they are tools that enable unique ways of thinking. Code provides the greatest control in working with these tools.

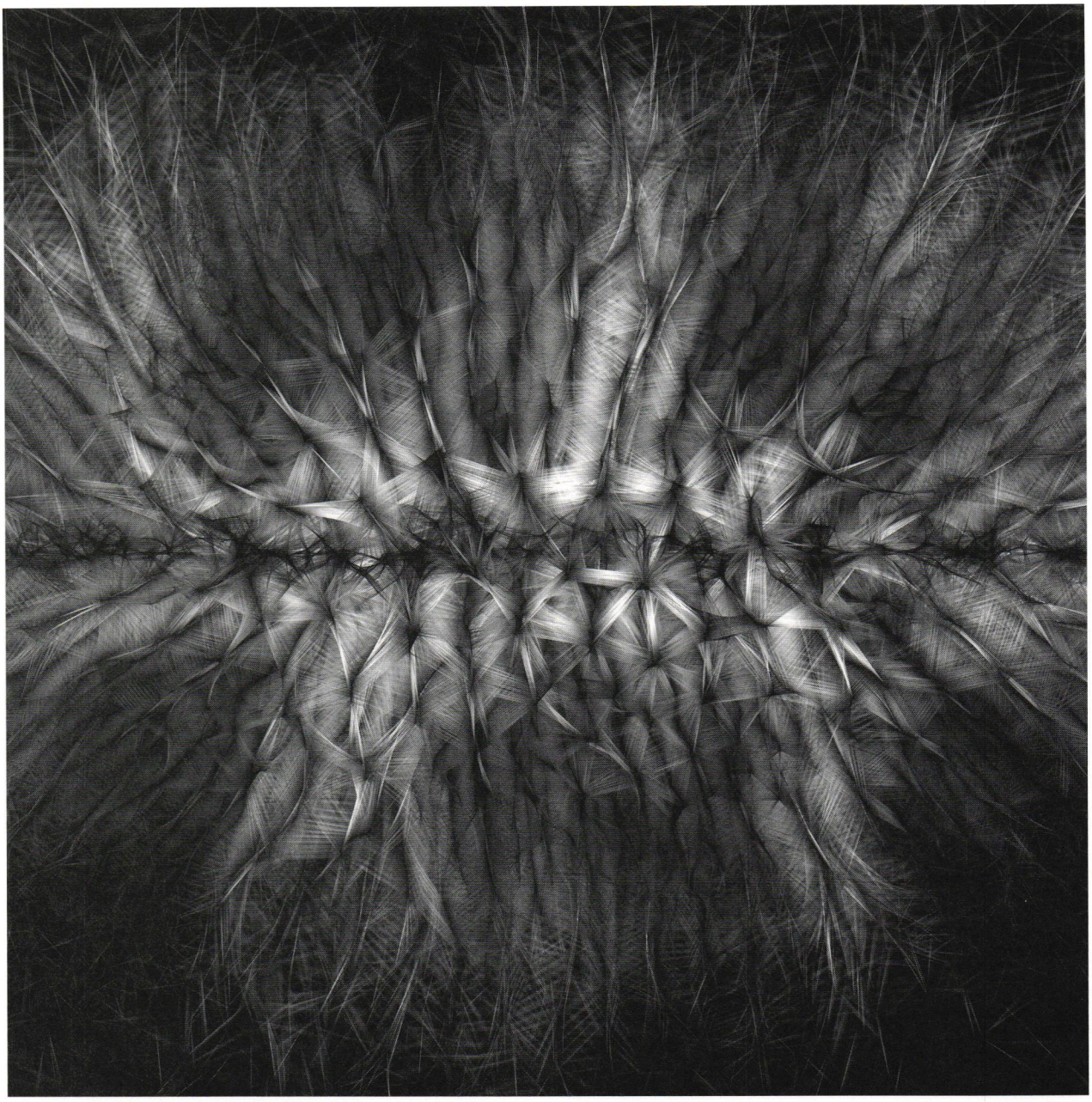


Process 13 (A), 2010

C print

Edition of 8 + 2 AP

50cm x 50cm

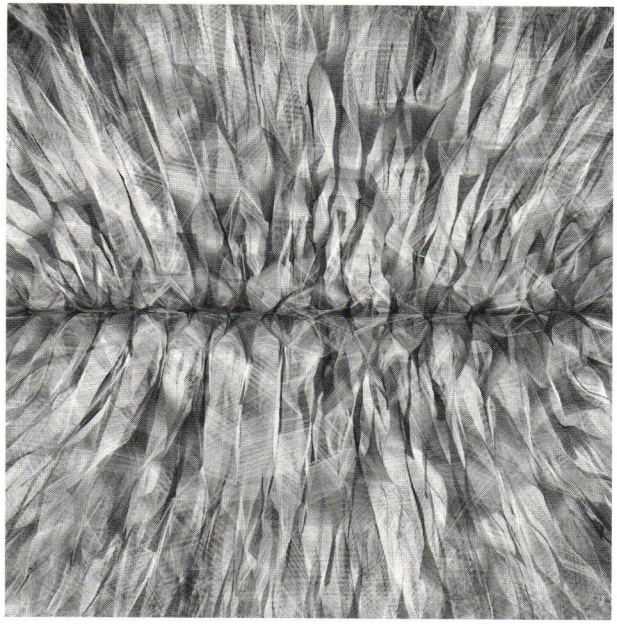


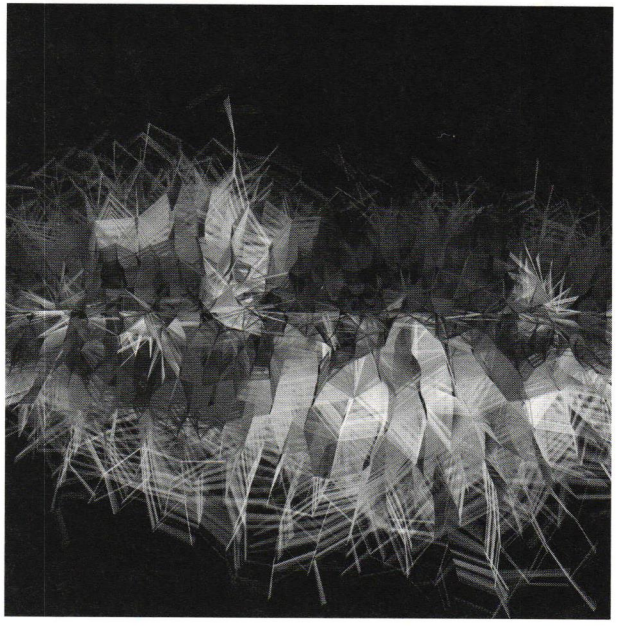
Process 13 (B), 2010

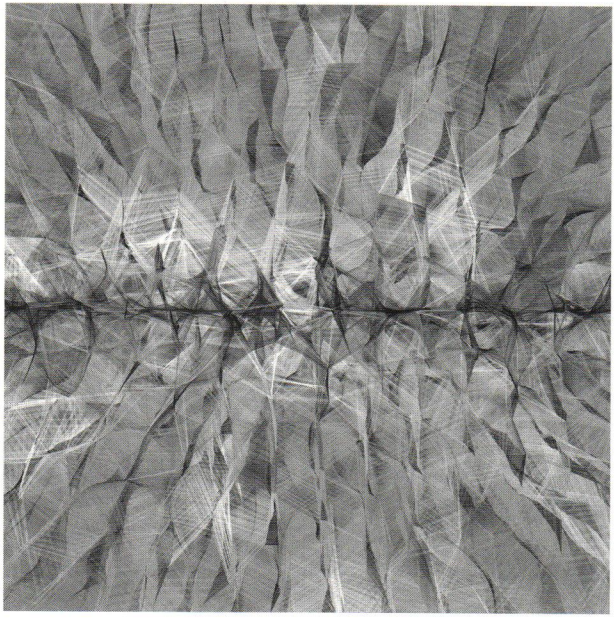
C print

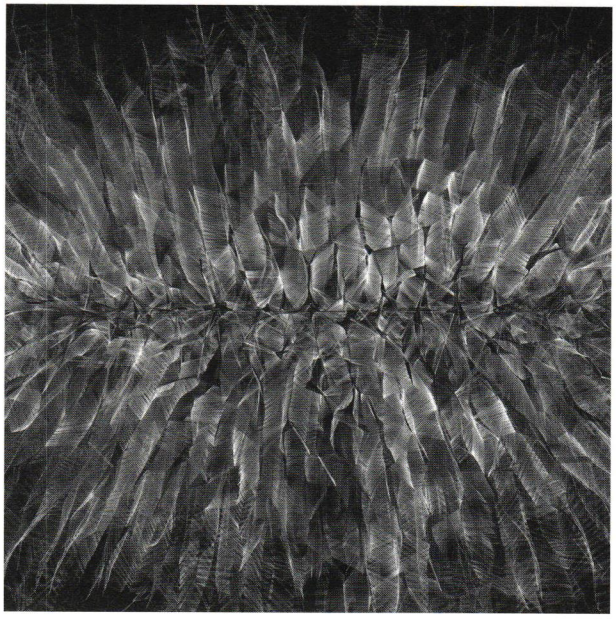
Edition of 8 + 2 AP

50cm x 50cm









Images captured from different software interpretations of *Process 13*

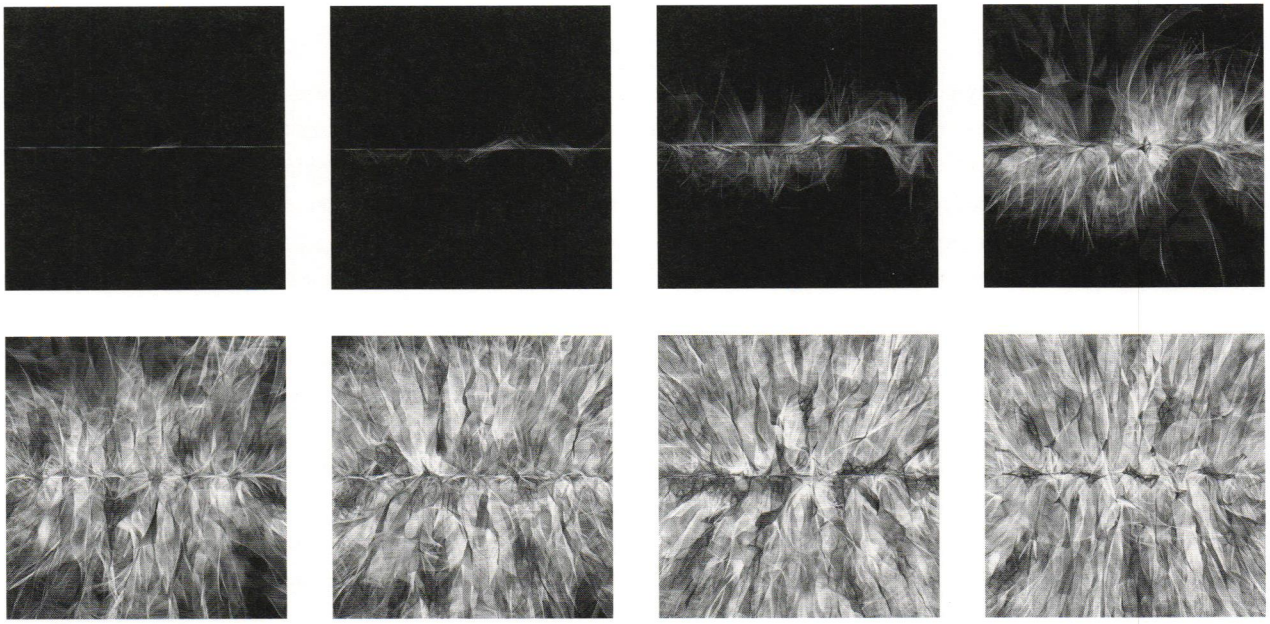


Image sequence from a software interpretation of *Process 13*

TSP: What new ways of understanding or thinking about the design process are introduced by working with code?

CR: Code enables me to work with systems and processes in ways that I can't without it. Computers and code are essential in my exploration of emergence.

TSP: What role does time play in *Process 13*?

CR: *Process 13* starts as instructions in English, but then becomes instructions in code that tell the computer what to do.

Contributor Biographies

Deborah Littlejohn

Deborah Littlejohn is a design researcher and educator. Her research is guided by questions that address the field of relations among networked technology, new information environments and design pedagogy, and the ability of people to learn, adapt and change. Her dissertation was a grounded theory study on the outcomes of relationships among curriculum, faculty beliefs, and the particular circumstances of the learning environment in innovative US design programs.

Littlejohn has taught design at several US programs in the areas of interaction design, motion graphics, typography and graphic design. From 2001–2006, she was a Resident Design Fellow at the University of Minnesota Design Institute where she led an investigation of leading practices in type design that resulted in the internationally-distributed publication *Metro Letters: A Typeface for the Twin Cities* (2003).

A desire to promote the value of research in design education and contribute to the field's ongoing dialogue has been extended through Littlejohn's participation in design conferences, invited lectures, student workshops, and in the professional and academic design press. Littlejohn received an Master of Fine Arts from California Institute of the Arts (1994) and a PhD in Design from North Carolina State University (2011).

Matt Tomasulo

Matt Tomasulo is a graduate of the Master of Landscape Architecture program at North Carolina State University, with a Master of City and Regional Planning from UNC Chapel Hill. He is the founder of CityFabric in Raleigh, which has a mission "to engage as many people as possible in conversation about their city." Tomasulo's most recent venture, *Walk Raleigh*, is a bottom-up campaign to engage residents and community members in a movement to recognize the walkability of Raleigh. Since *Walk Raleigh* has gained national and international exposure for its "spontaneous / tactical urbanism," Tomasulo has been asked to speak around the city and country on the subject of engaging communities in recognizing the walkability of their own urban environments.

Juhani Pallasmaa

Juhani Pallasmaa is a Finnish architect who has been a visiting professor of architecture at several universities in the USA, Europe and Africa: The Catholic University of America, Washington D.C. (2011); Plym Distinguished Professor at the University of Illinois at Urbana-Champaign in Champaign, Illinois (2010); Raymond E. Maritz Visiting Professor at Washington University in St. Louis (1999-2004); Thomas Jefferson Professor at the University of Virginia (2002), and; Eero Saarinen Visiting Professor at Yale University (1993). He is also former Professor and Dean of the Faculty of Architecture at the Helsinki University of Technology, former Director of the Museum of Finnish Architecture, and former Rector of the Institute of Industrial Arts, Helsinki. He is the author of numerous books, including *The Embodied Image: Imagination and Imagery in Architecture*; *The Eyes of the Skin: Architecture and the Senses*; *Encounters: Essays on Architecture*; and *The Thinking Hand: Embodied and Existential Wisdom in Architecture*. The last book is required reading for all architecture students in the College of Design at NC State. Pallasmaa ran the architecture studio, Arkkitehtitoimisto Juhani Pallasmaa, in Helsinki until 2011 when he decided to close down the design activities of his office.

Nicole Dotin

Nicole Dotin is a typeface designer and partner at Process Type Foundry in Golden Valley, MN. She earned a Bachelor of Fine Arts in Art from the University of Minnesota, a Master of Fine Arts in Visual Studies from the Minneapolis College of Art and Design, and an MA in Typeface Design from the University of Reading in the UK. She initially worked as a professional graphic designer, and later taught typography at MCAD while working part-time at Process Type Foundry.

Before heading to the UK for her MA in Typeface Design, Nicole initiated Process' rural studio experiment, moving the foundry to a remote region of northern Minnesota for 6 months. Dotin's first font family, *Elena*, was released in 2011.

Eve Edelstein

Dr. Eve Edelstein is a senior research specialist at the University of California, San Diego and an adjunct professor at the NewSchool of Architecture & Design in San Diego. Edelstein has a doctorate in neurophysiology from University College London, a Master of Architecture and a Bachelor of Arts in Anthropology from University of California, Berkeley. She has conducted research and provided clinical service at academic and medical centers in the UK and USA. As Principal Investigator for the AIA College of Fellows Latrobe 2005 Fellowship, she investigated the influence of light on physiological health and human performance indicators, relating biomedical research to design recommendations for circadian lighting. Ongoing research at the University of California, San Diego is based within an immersive virtual reality CAVE, and explores neural bases for the cognitive mapping in real and virtual environments, visual attention to architectural elements, and the influence of acoustic environments on medical and medication error. Edelstein teaches undergraduate and master's courses in neuroscience and architecture, environmental psychology, and design studios at the NewSchool of Architecture & Design. Her research-based design practice incorporates scientific methodologies in an evidence-based process that informs planning and design. Projects include international healthcare campuses, mental health facilities, and educational facilities in China, Canada, and the United States.

Fernando Magallanes

Fernando Magallanes is an Associate Professor of Landscape Architecture in the College of Design at North Carolina State University. He holds a Bachelor of Science in Landscape Architecture from Texas A+M University and a Master of Landscape Architecture from Harvard University's Graduate School of Design. Magallanes travels to Spain and the Czech Republic regularly. His travel, research, drawings and competition entries have advanced his search for historical and cultural influences found in 'places.' For him, the physical environment provides lessons for teaching designers about how to understand built environments and how those experiences can impact their own design methods, decisions, and values.

Erin White

Erin White is a graduate of the Master of Architecture program at North Carolina State University. He has a BA from Bowdoin College in Maine and studied at the Boston Architectural Center in Boston. White has been a chef, a carpenter, a statistician, and novelist before returning to North Carolina to continue his career in Architecture. This explains the merging of many motivations in White's work, which envisions new applications of architectural thinking and shifts in the role of the architect in planning, design and community development and connectivity.

Casey Reas

Casey Reas is an artist and professor at the University of California, Los Angeles. Reas has a master's degree from the Massachusetts Institute of Technology in Media Arts and Sciences as well as a bachelor's degree from the School of Design, Architecture, Art, and Planning at the University of Cincinnati. With Ben Fry, Reas initiated *Processing*, an open source programming language and environment for designers and artists. Reas is the co-author of the books *Form + Code in Design, Art and Architecture* and *Processing: A Programming Handbook for Visual Designers and Artists*.

He has exhibited his work nationally and internationally, most recently in North Carolina as a part of the *Deep Surface: Contemporary Ornament and Pattern* exhibition at the Contemporary Art Museum in downtown Raleigh. Reas' work focuses on the relationship between naturally evolved systems and those that are synthetic, through form, code, art and new media. He explores the generative relationship of new technology as applied to naturally static territories.

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The College of Design wishes to thank the following donors for their generous support of *The Student Publication* Campaign. Without their commitment we would not be able to revive this important publication.

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About the Publication

The Student Publication began as a tribute to Matthew Nowicki after his untimely death in 1950 at the age of 40. His influence and inspiration as head of the Department of Architecture inspired the students to create *The Student Publication* in his honor, and so the first issue focused on Nowicki's contributions to the College, the University and the field. Through the process, students realized the potential and importance of such a publication and collection of voices, that they continued the effort, focusing on timely and important issues in the field and inviting some of the most important and influential designers of the day to contribute letters, projects and articles. Such luminaries included Le Corbusier, Mies Van der Rohe, Buckminster Fuller and Richard Saul Wurman.

Between 1951 and 1985, 58 issues of *The Student Publication* were developed. From 1985—2000 the publication took a hiatus, but in 2000 the publication came back full force with the issue informally known as *The Phoenix*. Since then, working with an editorial advisor and committee, students have developed the theme, invited participants, curated, edited and designed 8 issues.

In 2012 *The Student Publication* was incorporated into a course on design writing, editing, curating and publishing. The 2012 team worked diligently to establish a new model for the publication that includes a robust archiving plan, distribution in both print and online forms, and a strong promotional campaign that connects the publication to emerging topics in design education, practice and thinking.

Deb Littlejohn
Matt Tomasulo
Juhani Pallasmaa
Nicole Dotin
Eve Edelstein
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Erin White
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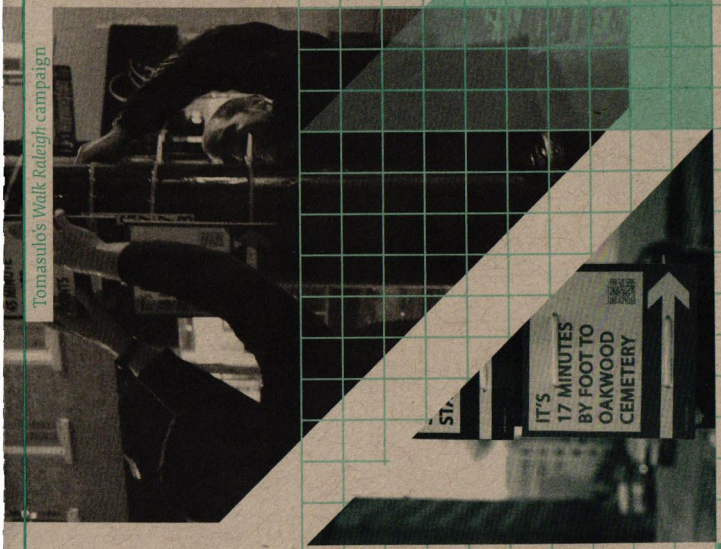

Tomasulo's *Walk Raleigh* campaign

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LITTLEJOHN

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¶A desire to promote the value of research in design education and contribute to the field's ongoing dialogue has been extended through Littlejohn's participation in design conferences, invited lectures, student workshops, and in the professional and academic design press. In 2009, Littlejohn authored the winning proposal as a co-recipient of the AIGA Annual Research Grant. Her most recently completed projects include the design of a college-level textbook about graphic design theory, authored and edited by Meredith Davis (forthcoming, Fall 2012, Thames & Hudson), and a paper presented at the 2011 Doctoral Education in Design Conference in Hong Kong that will be published in the *Proceedings of the Doctoral Education in Design Conference* (forthcoming, Fall 2012). Littlejohn received an Master of Fine Arts from California Institute of the Arts (1994) and a PhD in Interdisciplinary Design from North Carolina State University (2011).

¶Her article will explore the "implications of change in design education in the wider context of emergent practices through an interrogation of several long-standing beliefs, values and norms in design pedagogy, including: the field's association with other disciplines; the traditional academic context of the design

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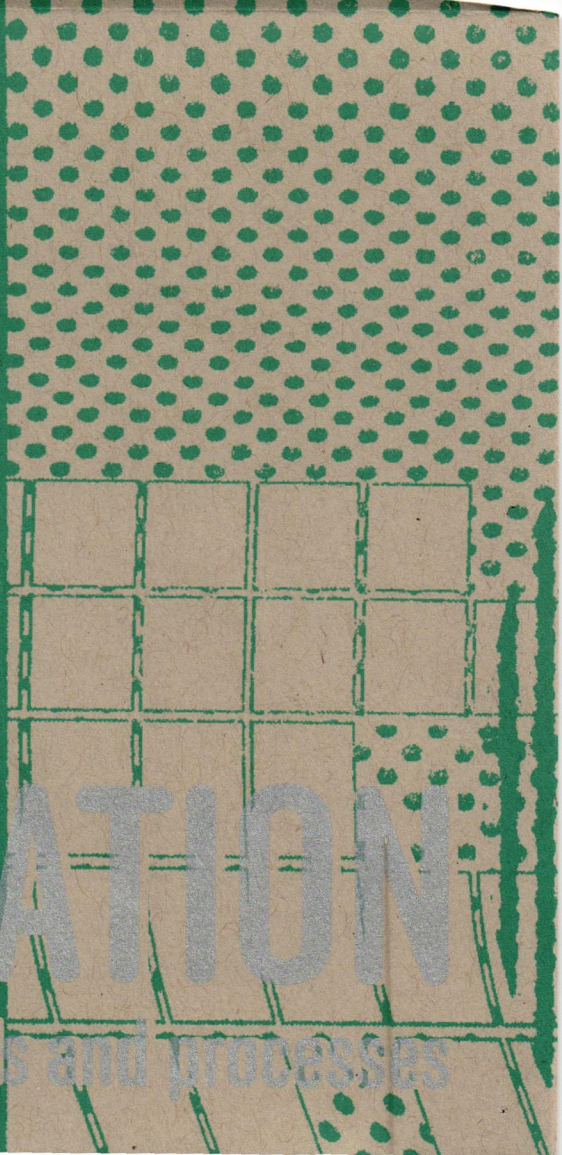
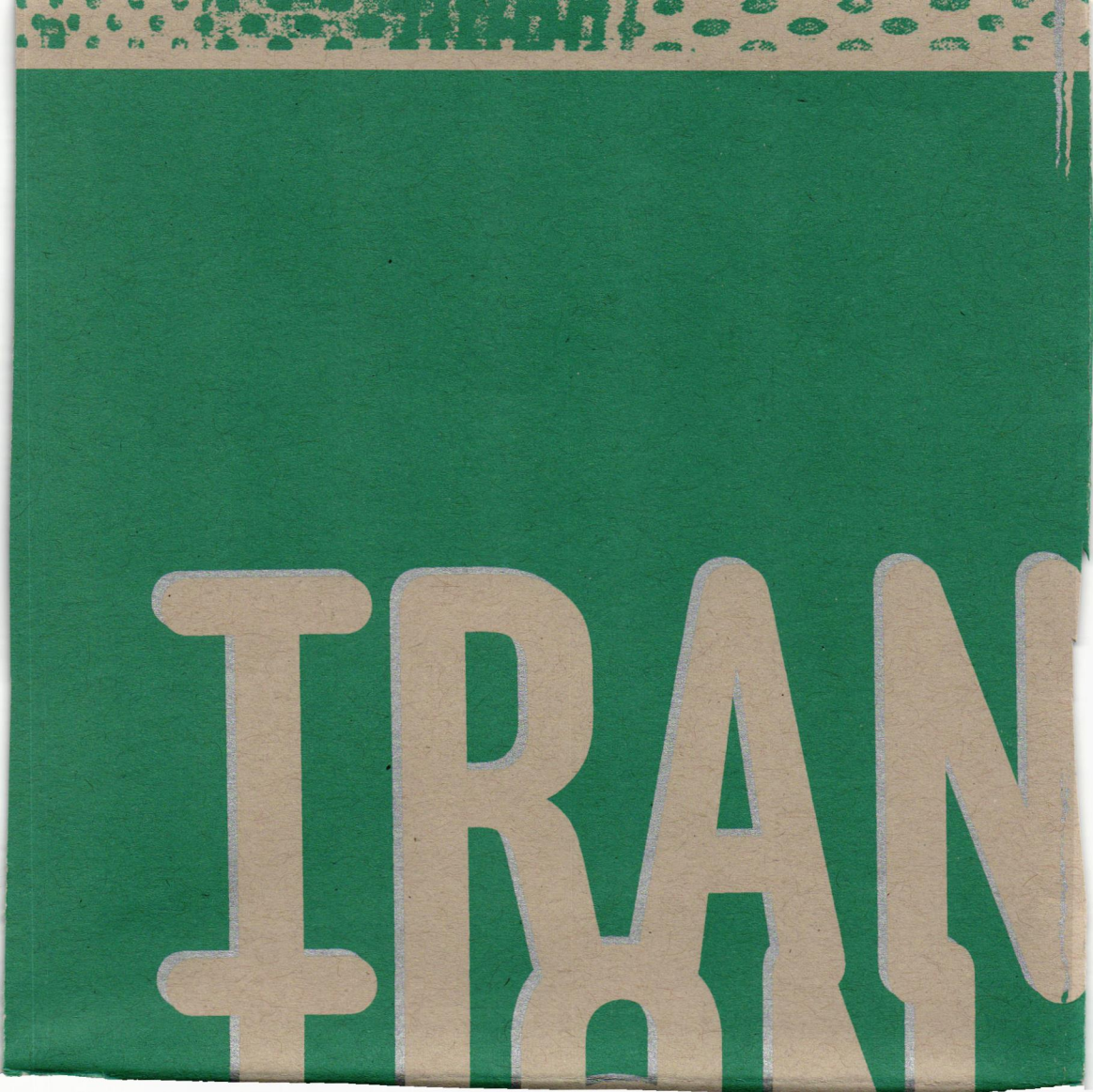


EVE EDELSTEIN

Dr. Eve Edelstein is a senior research specialist at the University of California, San Diego and an adjunct professor at the New School of Architecture & Design in San Diego. Edelstein has a doctorate in neurophysiology from University College London, a Master of Architecture and a Bachelor of Arts in Anthropology from University of California, Berkeley. She has conducted research and provided clinical service at academic and medical centers in the UK and USA. As Principal Investigator for the AIA College of Fellows Latrobe 2005 Fellowship, she investigated the influence of light on physiological health and human performance indicators, relating biomedical research to design recommendations for circadian lighting. Ongoing research at the University of California, San Diego is based within an immersive virtual reality CAVE, and explores neural bases for the cognitive mapping in real and virtual environments, visual attention to architectural elements, and the influence of acoustic environments on medical and medication error. Edelstein teaches undergraduate and master's courses in neuroscience and architecture, environmental psychology, and design studios at the New School of Architecture & Design. Her research-based design practice incorporates scientific methodologies in an evidence-based process that informs planning and design. Projects include international healthcare campuses, mental health facilities, and educational facilities in China, Canada, and the United States.

¶Edelstein's contribution will investigate the interrelationship between design process, new technologies, and neuroscientific response. She will be including interactive work that provides examples and new ways of thinking about how design education and practice might incorporate these processes into conceptual and prototyping phases of design development.

school; program organization; curricula and course structure; project assignments and the design process; methods of student evaluation; and the "sacred cow" of an education in design—the studio."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the embodied and tactile world of the hand has been heightened by the computerized methods of drawing, modelling and designing. This digital development is actually detaching the human processes of thinking and imagination from their essential connection with memory, body, and the sense of existence and self."

MATT TOMASULO

Tomasulo's *Walk Raleigh* signs

Matt Tomasulo is a graduate of the Master of Landscape Architecture program at North Carolina State University, with a Master of City and Regional Planning from UNC-Chapel Hill. He is the founder of City Fabric in Raleigh, which has a mission "to engage as many people as possible in conversation about their city." Tomasulo's most recent venture, *Walk Raleigh*, is a bottom-up campaign to engage residents and community members in a movement to recognize the walkability of Raleigh. Since *Walk Raleigh* has gained national and international exposure for its "spontaneous / tactical urbanism," Tomasulo has been asked to speak around the city and country on the subject of engaging communities in recognizing the walkability of their own urban environments.

¶His article, tentatively named *Accessing the City* will address "how now is such an opportunity for anyone to have a large-scale impact through small-scale interaction. *Walk Raleigh* will be used as a case study to examine how the contemporary age of communication, information, innovation and connectivity can now enable anyone to be a game-changer in today's dynamic civic and social community culture."

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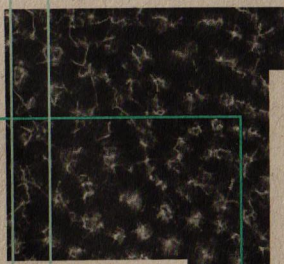
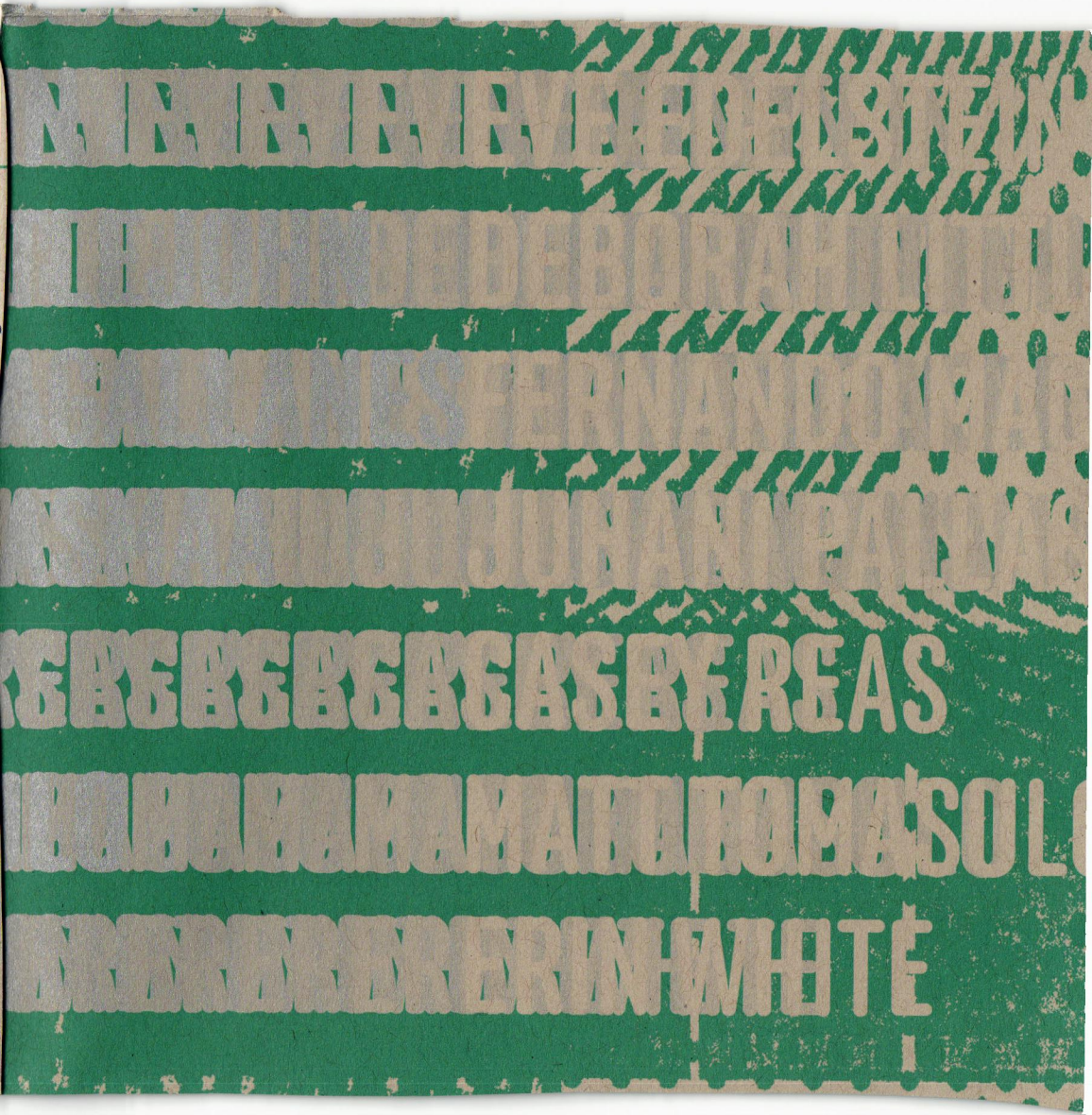


Image from Reas' *Process Compendium*

Casey Reas is an artist and professor at the University of California, Los Angeles. Reas has a master's degree from the Massachusetts Institute of Technology in Media Arts and Sciences as well as a bachelor's degree from the School of Design, Architecture, Art, and Planning at the University of Cincinnati. With Ben Fry, Reas initiated *Processing*, an open source programming language and environment for designers and artists. Reas is the co-author of the books *Form + Code in Design, Art and Architecture* and *Processing: A Programming Handbook for Visual Designers and Artists*. He has exhibited his work nationally and internationally, most recently in North Carolina as a part of the *Deep Surface: Contemporary Ornament and Pattern* exhibition at the Contemporary Art Museum in downtown Raleigh.

Reas' work focuses on the relationship between naturally evolved systems and those that are synthetic, through form, code, art and new media. He explores the generative relationship of new technology as applied to naturally static territories. Reas' contribution to Volume 35 of *The Student Publication* will form a visual essay related directly to his *Process Compendium* project from 2010. The visual essay will focus on a sequential set of images that visualize the transformation of a diagram through software, with annotations that are both explanatory and provocative of the form and theory of programming within the context of the arts.

outwards to include the system; ought to extend to the programming of system interventions; ought to extend to and internalize socio-cultural implications, ecological responsibility, and community-based solutions. By moving upstream in the design process to filling a position of collaborative partner in food system conversations, architects will discover meaningful applications of their particular methods of thinking and problem solving."

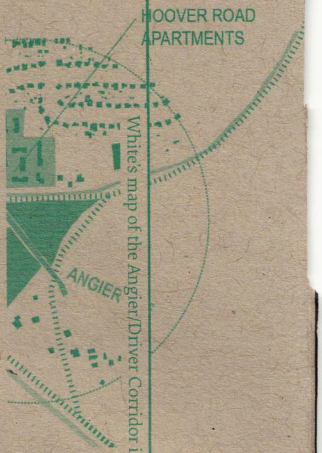


ERIN WHITE

Erin White is a graduate of the Master of Architecture program at North Carolina State University. He has a BA from Bowdoin College in Maine and studied at the Boston Architectural Center in Boston. White has been a chef, a carpenter, a statistician, and novelist before returning to North Carolina to continue his career in Architecture. This explains the merging of many motivations in White's work, which envisions new applications of architectural thinking and shifts in the role of the architect in planning, design and community development and connectivity.

¶White's article will focus on this shifting role of architecture in helping build healthy community food systems to extend well beyond the conventional role of the architect as building designer. "By working at multiple scales and allowing design data to move fluidly, the skills and training of the architect may find important contributions to the complex problems in which buildings play only a small role. Any efforts to reverse the trends toward industrial scale globalized agriculture and its attendant crises in health and hunger must deal with very complex systems at multiple scales. The architectural design *per se* of farm, market, or outreach buildings, however intelligent, typically won't engage the critical junctures of community health, food policy, and urban placemaking that must be addressed in these problems. While 'architecture' may be limited to built spaces, architectural areas of expertise such as systems thinking, collaborative design, spatial analysis, and visual communication extend much further than the conventional service mechanism takes advantage of."

¶"Architectural practice," White argues, "ought to extend from the building



White's map of the Angier/Driver Corridor in Durham, NC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rchers, *Meta Architectura*, 1975

JUHANI PALLASMAA

Juhani Pallasmaa is a Finnish architect who has been a visiting professor of architecture at several universities in the USA, Europe and Africa: The Catholic University of America, Washington D.C. (2011); Plym Distinguished Professor at the University of Illinois at Urbana-Champaign in Champaign, Illinois (2010); Raymond E. Maritz Visiting Professor at Washington University in St. Louis (1999-2004); Thomas Jefferson Professor at the University of Virginia (2002), and; Eero Saarinen Visiting Professor at Yale University (1993). He is also former Professor and Dean of the Faculty of Architecture at the Helsinki University of Technology, former Director of the Museum of Finnish Architecture, and former Rector of the Institute of Industrial Arts, Helsinki. He is the author of numerous books, including *The Embodied Image: Imagination and Imagery in Architecture*; *The Eyes of the Skin: Architecture and the Senses*, *Encounters: Essays on Architecture*; and *The Thinking Hand: Embodied and Existential Wisdom in Architecture*. The last book is required reading for all architecture students in the College of Design at NC State. Pallasmaa ran the architecture studio, Arkkitehtitoimisto Juhani Pallasmaa, in Helsinki until 2011 when he closed down the design activities of his office.

¶Pallasmaa's article is based on his preface to the recent Russian edition of *The Thinking Hand*, and it was written specifically for *The Student Publication*. In the article, Pallasmaa considers the interrelationship of technology, handwork and thinking. "During the past century and half," Pallasmaa argues, "the mechanized and automated processes of industrial manufacture have largely eliminated the presence of the human hand from our daily objects and settings of life. This gradual distancing from

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FERNÁNDO MAGALLANES

Fernando Magallanes is an Associate Professor of Landscape Architecture in the College of Design at North Carolina State University. He holds a Bachelor of Science in Landscape Architecture from Texas A+M University and a Master of Landscape Architecture from Harvard University's Graduate School of Design. Magallanes travels to Spain and the Czech Republic regularly. His travel, research, drawings and competition entries have advanced his search for historical and cultural influences found in 'places.' For him, the physical environment provides lessons for teaching designers about how to understand built environments and how those experiences can impact their own design methods, decisions, and values.

¶Magallanes' article will focus on the relationships among drawing, sketching, understanding and creativity. His drawings "augment the sense of adventure that drives questions in seeking both content and an essential nature. At its essence, drawing begins with abstracting place through principles and elements of design—color, line, pattern, textures, and value. But the act of drawing also builds knowledge through seeing and experiencing many situations and phenomena including human transformations, interventions, design elements, natural phenomena, landscape, architecture, space, and human use."

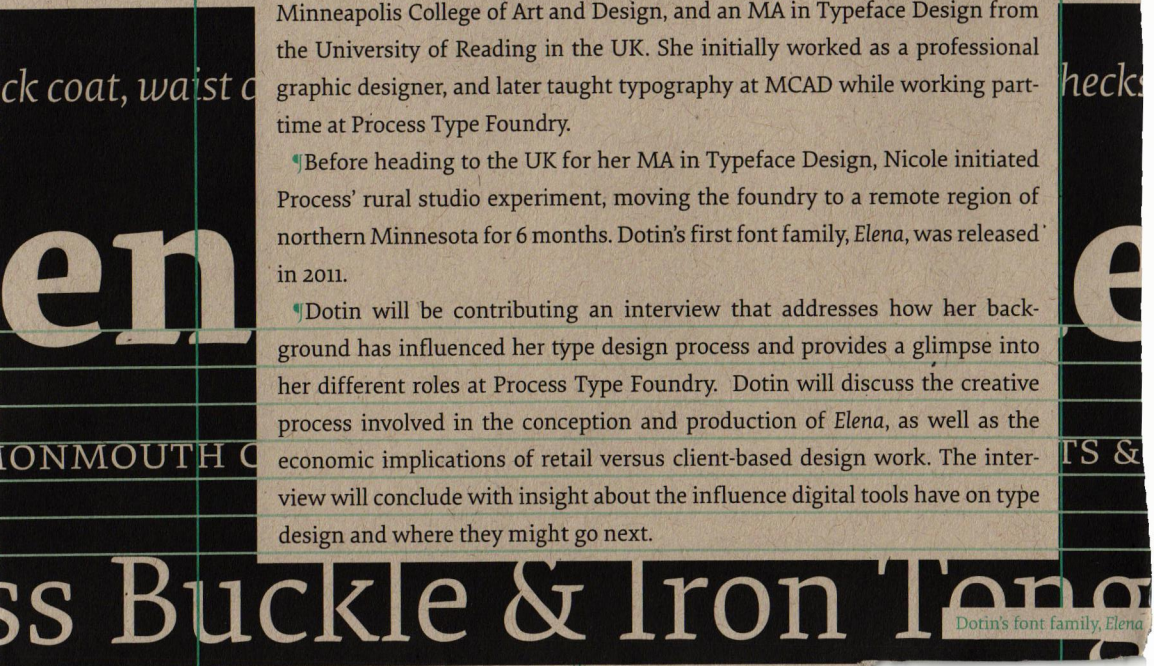
Process sketches by Fernando Magallanes

NICOLE DOTIN

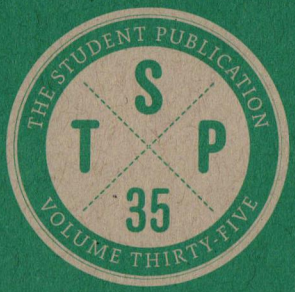
Nicole Dotin is a typeface designer and partner at Process Type Foundry in Golden Valley, MN. She earned a Bachelor of Fine Arts in Art from the University of Minnesota, a Master of Fine Arts in Visual Studies from the Minneapolis College of Art and Design, and an MA in Typeface Design from the University of Reading in the UK. She initially worked as a professional graphic designer, and later taught typography at MCAD while working part-time at Process Type Foundry.

¶Before heading to the UK for her MA in Typeface Design, Nicole initiated Process' rural studio experiment, moving the foundry to a remote region of northern Minnesota for 6 months. Dotin's first font family, *Elena*, was released in 2011.

¶Dotin will be contributing an interview that addresses how her background has influenced her type design process and provides a glimpse into her different roles at Process Type Foundry. Dotin will discuss the creative process involved in the conception and production of *Elena*, as well as the economic implications of retail versus client-based design work. The interview will conclude with insight about the influence digital tools have on type design and where they might go next.



Dotin's font family, *Elena*



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North Carolina State University

design as art

e from Reas' *Process Compendium*

"Hand and Ink" ©Phillip Tidwell, from *The Thinking Hand* by Juhani Pallasmaa


Perspectives on Design
and Processes
VOLUME

Letter from the Editors

Volume 35 of The Student Publication *is an inquiry into how design education, theory, and practice are transforming and adapting to new cultural and technological contexts. By including contributions from educators, theorists, and practitioners that are pushing the envelope in their respective areas of expertise, we hope to create a dialogue not only about possible approaches to design, but also how those approaches may change in the future.*

The theme of this year's publication, Transformation, *includes various perspectives on shifting methods and processes in design. Recent lectures, exhibitions, and interactions with faculty and students all affect the experiences of students in the College of Design at North Carolina State University. Obvious or not, these activities and people will in some way influence future designers and reflect larger changes for design beyond the College. In anticipation of the release of the publication, we hope these abstracts engage and excite you about what is to come.*

Michael Carbaugh and Craig Maxwell

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The Student Publication

TRANS FORM ATION

NEW PERSPECTIVES ON DESIGN METHODS AND PROCESSES