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Introduction

One way to conceptualize the process of reading a journal like *Design Issues* is to imagine it as a series of fortuitous encounters through which authors introduce their readers to issues, ideas and experiences. In this issue, for example, readers will encounter thoughtful discussions of aesthetics, management, education and design history. Allan Whitfield challenges us to think of aesthetics not as the artistic aspect of design but rather as a philosophical process for generating a distinctive form of knowledge. Barbara Jaffe unravels the relationship between vocational training and spiritual uplift as goals informing design education in Chicago prior to the arrival of the New Bauhaus. In an exercise he characterizes as "cultural archaeology" Thomas Leslie takes a fresh look at a familiar icon of modern design: the Pan Am Terminal in New York City. Rizal Sebastian advances a model for identifying the common ground between design and management as a contribution to the development of a more effective model of design management. Attentive readers note not only what is said but how. This issue is unusually strong in first person accounts of design. Carl Mitcham, for example, uses his first person account of building a house for himself in the Sangre de Christo mountains of Colorado to reflect on Martin Heidegger's seminal essay "Building, Dwelling, Thinking." Shahriar Sarmast's interview with the Iranian graphic designer Morteza Momayez provides readers with an opportunity to get to know this important figure. Momayez responds to Sarmast's probing questions in a personal manner. He speaks of his roots and reflects on the process of aging in ways that reveal the personal story embedded within the professional career. It is tempting to treat this interview as providing a peek at an exotic figure from a distant land but Momayez is not describing an exotic experience. He is recounting his life and practice in his homeland. Describing Momayez as exotic is indicative of a way of thinking based on a crude model of center and periphery operating within the world of design. It is this model that Sherry Blankenship warns us about in her first person account of working around the globe with students from different cultures. Concepts such as globalization and center-periphery relationships are useful to the degree they accurately model phenomena but they fail us when they masked the true complexity of design cultures. Blankenship argues we need to be more thoughtful in developing the interpretive frameworks we impose on design experiences around the globe. In her essay Blankenship reminds us that design conveys "the flash of the human spirit by which the soul of a culture reaches into the material world." Such reminders are valuable in a world

that too often ignores the marvels and the needs of the human spirit in pursuit of efficiency and profit. The editors of this journal believe that encounters illuminated by "the flash of the human spirit" sustain and enrich design discourse.

Richard Buchanan
Dennis Doordan
Victor Margolin

Aesthetics as Pre-linguistic Knowledge:
A Psychological Perspective
T. W. Allan Whitfield

Introduction

As an emerging field distinct from architecture and the fine arts, proponents of design have sought the theoretical underpinnings necessary to establish it as a discipline in its own right. Perspectives from other disciplines, particularly the two broad areas of science and cultural studies, influenced this pursuit of "design theory." Scientific influences were prevalent at various times, derived from such fields as materials science, engineering, and ergonomics/human factors, particularly in application to industrial design. These influences also permeated attempts to describe design as a scientific activity, and to identify a method of design that would follow similar principles to those characteristic of the scientific method.[1] However, both designers and design theorists challenged the concept of design practice as a scientific activity, instead advocating various conceptions of "design thinking" and the search for "an epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty."[2]

Such an "epistemology of practice" does not fit comfortably with the current emphasis on the social and cultural analysis of design as manifest in products and "commodities." Within this paradigm, material culture and its artifacts provide a coded system indicating social identity. Numerous theoretical articulations of this are available, with a lineage stretching back to Veblen. While such analyses provide insight into socially and culturally specific aspects of design, and designed objects in particular, they are susceptible to the criticism that they are culture specific.[3] Nonetheless, they tell us much about late and current Western culture, and our shifting positions as receivers or consumers of culture.

Of recent theorists, Buchanan is notable for his broad overview of design and the multifaceted structure that he provides. Within this, he observes that "the desirability of products has proven to be more complex than it was thought to be in earlier design theory. Aesthetics plays a role, but the deeper problem seems to be one of 'identification.'"[4] "Identification" alludes to questions of social standing and identity, and the way that products may reflect lifestyle and social positioning. Clearly, this is an important factor, particularly in Western societies, with their scope for choice and

1   N. Cross, "Designerly Ways of Knowing: Design Discipline Versus Design Science," *Design Issues* 17:3 (2001): 51–52.

2   Ibid., 53.

3   J. Evans and S. Hall, "What Is Visual Culture?" in *Visual Culture: The Reader,* J. Evans and S. Hall, eds. (London: Sage Publications, 1999), 2.

4   R. Buchanan, "Design Research and the New Learning," *Design Issues* 17:4 (2001): 16.

identity creation. However, and contrary to Buchanan's view, it is contended here that the role of aesthetics is much less understood and constitutes the "deeper problem." Aesthetics remains the intractable problem, ubiquitous in its prevalence, yet resistant to analysis. All design fields deal explicitly with the aesthetic. This is a defining characteristic of design, and constitutes a fundamental omission in attempts to construct design theory. It is this omission that is the focus of this paper.

The very term "aesthetics" is misleading. Originally coined by Baumgarten in 1735 to refer to the philosophical pursuit of laws pertaining to art, it has generated a raft of theorizing, largely within philosophy but also within art theory. Within this, questions pertaining to beauty, harmony, and art dominated.[5] However, in its earlier classical Greek meaning it referred to sensory-perceptual knowledge (*aisthêsis*), as distinct from intellectual/linguistic knowledge (*noêsis*)[6]—a distinction that is consistent with the argument to be advanced here. To position this historically, it was not until after the European Renaissance that "taste" lost its literal, gustatory meaning and became associated with "artistic" judgment. Also, at this time, the association of the term "art" with painting, sculpture, and architecture evolved, later to be extended to include poetry and music, into what now are termed the "fine arts." Art, as we understand it now, has been around for less than three hundred years. Even the notion of "disinterested aesthetic appreciation" has an eighteenth century Western origin, with a minority application within a minority culture. This preoccupation has been misleading. Aesthetics finds expression in the design appearance of everyday things. It is contended here that the domain of aesthetics over-focused on these post-Renaissance category members, and failed to appreciate the extent of the phenomena. Similarly, the dimensions of meaning favored in this domain were narrowly focused, again representing the more Eurocentric and elite response categories (beauty, harmony). The displacement of the classical Greek meaning of *aisthêsis* has not assisted. This paper, and the model of aesthetics that it outlines, approaches aesthetic perception in line with the broader classical Greek notion, rather than the more common, narrow definition pertaining to art. Furthermore, it approaches aesthetics from perhaps the unusual standpoint of experimental psychology; that is, from a vantage point in which theory construction must be subject to experimental verification. In so doing, it draws heavily upon research in cognitive psychology and neurophysiology. The intention is to provide a model of aesthetics that is conceptually useful to designers.

Reflecting the notorious difficulty of the subject, aesthetics has not fared well in twentieth-century psychology, while in philosophy it has fared little better, being, as Sparshott[7] observed, "more generally despised than any other branch of philosophical enquiry." The dominance of behaviorism and later cognitivism relegated aesthetics

5 F. E. Sparshott, *The Structure of Aesthetics* (London: Routledge and Kegan Paul, 1963).

6 J. Rée, *I See a Voice* (London: Harper Collins, 1999).

7 Ibid.

to obscurity, despite its illustrious beginnings in 1876 as the second published area of experimental psychology. Theoretical resources for probing aesthetics were problematic, and this largely was due to the dissociation of emotion from cognition by both behaviorism and cognitivism, the dominant theories in psychology since the early twentieth century. Emotion was considered "noise" within the system. Before the twentieth century, however, the dominant theories of the mind were essentially perceptual, in which images and sensory meaning provided the foundation of knowledge. The emergence of language theorists and behaviorism in the early twentieth century, followed by the cognitive revolution in the mid-twentieth century, effectively undermined the perceptualist position. This period also witnessed the demise of emotion as a mainstream psychological domain and, as might be expected, aesthetics as a quasi-emotion followed emotion down. Over the past two decades, however, neurophysiological research into brain functioning and the recognition of the primacy of emotion precipitated a resurgence of research into emotion. In parallel, the perceptualist position advanced and, with it, notions of aesthetics that rely less upon a mentalist-linguistic rationale. Furthermore, the "new" aesthetics is less reliant upon object analysis, material culture, and critique—and more upon perceptual knowledge and its articulation. The purpose of this paper is to describe one such perceptualist theory, and to elucidate its application within design.

The model that this paper describes, the "categorical-motivational model," advances the notion of aesthetics as pre-linguistic cognition, as a form of "knowing" that preceded the evolution of language. It is contended that the function of aesthetics is to elaborate the categories by which we understand the world, by attaching emotion to sensory perceptions. Before the evolution of language, this function would result in the creation of units of "affective knowledge" that would "motivate appropriate action"[8] to objects in the external world. With the evolution of language and its associated knowledge, this underlying function remains, but coexists with the more "conscious" form of linguistic knowing. However, as will be discussed later, sensory-perceptual knowledge is by no means a poor relation to linguistic-based knowledge. On the contrary, it constitutes the dominant form of knowledge, and provides the very foundation for its linguistic add-on.

The categorical-motivation model derives from two main sources. First, it reconciles two opposing theories within psychology, what will be termed the motivational model and the categorical model. Secondly, it relies heavily upon the notion of sensory-perceptual knowledge and, in so doing, reverts to the classical Greek concept of aesthetics.

8   P. M. Niedenthal, J. B. Halberstadt, and A. H. Innes-Ker, "Emotional Response Categorization," *Psychological Review* 106 (1999): 337–361.

The Motivational Model

The most comprehensive theory of aesthetics to emerge from mainstream psychology came from Berlyne.[9] He asked the questions: "Why do we engage in aesthetic activities? What motivates us—and what are the rewards?" These are not unreasonable questions, and ones to which psychology should provide some answers. After all, aside from professional designers and artists, millions of people engage in listening to or performing music, designing, and artistic pursuits. The range and diversity of activities would be difficult to account for via critical theory analyses alone.

Berlyne conceived of aesthetic activities as an elaborate form of play in which a mild form of pleasure would be induced. Central to Berlyne's theory was the notion of "physiological" arousal and the need to maintain a level that is neither too high nor too low. Three types of sensation induce arousal: psychophysical, ecological, and collative. Psychophysical refers to such properties of stimuli as levels of noise and brightness of color. Ecological refers to events taking place around us, and in which social factors would be accommodated. Collative sensations interested Berlyne, and it was on these that he focused. Collative refers to comparisons between either stimulus elements, which render the stimulus more or less complex; or aspects of experiences, which render the stimulus more or less novel. Berlyne hypothesized that collative stimuli inducing a moderate level of arousal will be found pleasurable, while those inducing a very low or very high level of arousal will be found less pleasurable. This relates to the notion of pleasure involving the "right" amount of stimulus rather than too much or too little. Berlyne's position found support from neurophysiological studies indicating that arousal levels activated pleasure and aversion centers within the brain.[10]

In relation to design, Berlyne's model posits that we should seek exposure to novel or new experiences that attain a desired level of arousal. The underlying motivation is built into humans as the need to explore and, in so doing, to assimilate new information. As information-seeking animals, the quest for sensory-perceptual novelty probably is wired in to the brain. From the standpoint of the designer, the pursuit of novelty is consistent with the quest for "new" designs and, from the standpoint of the receiver, the positive receptivity to such new designs. However, in line with Berlyne's model, such experiences should not be so novel as to extend beyond an intermediate level, otherwise they become aversive. Effectively, novelty must be clearly founded in the familiar.

The Categorical Model

While a number of studies within experimental psychology provided support for Berlyne's theory, by the 1970s, a growing body of results was inconsistent. Most of the research supporting Berlyne's model derived from studies involving people's responses to stimuli that normally only would be encountered in an experimental situation;

9   D. E. Berlyne, *Aesthetics and Psychobiology* (New York: Appleton-Century-Crofts, 1971).

10   J. Olds and P. Milner, "Positive Reinforcement Produced by Electrical Stimulation of Septal Area and other Regions of Rat Brain," *Journal of Comparative Physiology* 47 (1954): 419–427.

11   T. W. A. Whitfield and P. E. Slatter, "The Effects of Categorization and Prototypicality on Aesthetic Choice in a Furniture Selection Task," *British Journal of Psychology* 70 (1979): 65–75.

12   Ibid.

13   D. P. A. O'Hare, "Individual Differences in Perceived Similarity and Preference for Visual Art: A Multidimensional Scaling Analysis," *Perception and Psychophysics* 20 (1976): 445–452; D. P. A. O'Hare and I. E. Gordon, "Dimensions of the Perception of Art: Verbal Scales and Similarity Judgements," *Scandinavian Journal of Psychology* 18 (1977): 66–70; P. Hekkert and P. C. W. van Wieringen, "Complexity and Prototypicality as Determinants of the Appraisal of Cubist Paintings," *British Journal of Psychology* 81 (1990): 483–495.

14   T. Gärling, "The Structural Analysis of Environmental Perception and Cognition: A Multidimensional Scaling Approach," *Environment and Behaviour* 8 (1976): 385–415; A. T. Purcell, "The Aesthetic Experience and Mundane Reality" in *Cognitive Processes in the Perception of Art,* W. R. Crozier and A. J. Chapman, eds., (Amsterdam: North-Holland, 1984); D. M. Pedersen, "Perception of Interior Designs," *Perceptual and Motor Skills* 63 (1986): 671–676.

15   J. H. Langlois and L. A. Roggman, "Attractive Faces Are Only Average," *Psychological Science* 1 (1990): 115–121.

16   C. Martindale and K. Moore, "Priming, Prototypicality, and Preference," *Journal of Experimental Psychology: Human Perception and Performance* 14 (1988): 661–670.

17   P. Hekkert, K. Morel, and D. Snelders, "Typicality, Originality, and Aesthetic Preference," *Proceedings of the XIVth Congress of the International Association of Empirical Aesthetics* (Prague, 1996, unpublished).

18   J. C. Ward, M. J. Bitner, and J. Barnes, "Measuring the Prototypicality and Meaning of Retail Environments," *Journal of Retailing* 68 (1992): 194–220.

19   B. Loken and J. Ward, "Alternative Approaches to Understanding the Determinants of Typicality," *Journal of Consumer Research* 17 (1990): 111–126.

for example, dot patterns and random polygons, the type of atomistic material then favored in experimental psychology. While Berlyne's model achieved success in explaining the results of experiments using such stimuli, it had difficulty with research that involved responses to real-world objects such as paintings, buildings, and furniture. These latter studies showed that the category to which the stimulus belonged exerted a powerful influence on people's aesthetic responses.

Whitfield and Slatter [11] advanced the "categorical model" in 1979 to account for these discrepant findings. They explained the effect of categories on people's aesthetic responses by adopting a cognitive interpretation, as opposed to Berlyne's motivational approach. They argued that objects are not evaluated per se, but rather are judged in relation to the cognitive category accessed. Effectively, stimuli are processed via categorical mediation, meaning that the way people respond aesthetically to objects will be determined by the categories they already have developed for understanding such objects—after all, this is how perceptual cognition operates. In addition, the extent to which a stimulus is typical—or prototypic—of the category accessed determines affect, whereby people will find more pleasure in objects that fit well into their predetermined categories. In other words, a chair is not evaluated as a discrete chair, but rather as a member of the cognitive category "chair." Furthermore, the more typical—or prototypic—an individual chair is of the cognitive category "chair," the higher the evaluation of it. Termed "preference-for-prototypes," this hypothesis has been remarkably robust in predicting people's evaluations of a wide range of objects, from furniture,[12] paintings,[13] and buildings,[14] to faces[15] and colors.[16] Notably, it also found explicit application in the area of design to explain people's evaluations of telephones,[17] retail fast-food environments,[18] consumer products,[19] and "brands." [20]

In its application to design, the categorical model posits that we should seek exposure to designs that conform to expectations. Effectively, a chair should correspond to our internal cognitive representation of "chair." A chair should look like a chair, and a piano should look like a piano; just as apples should look like apples, and tomatoes like tomatoes. At a more differentiated category level, a Georgian chair should look like a Georgian chair, and a grand piano should look like a grand piano. This is the converse of Berlyne's model favoring novelty. The categorical model posits that we like what we know, that pleasure is generated by the confirmation of expectations, and that familiarity breeds pleasure—as distinct from contempt.

The Categorical-Motivation Model
Clearly, the models make conflicting predictions. The motivational model predicts that a moderate discrepancy from expectations—novelty—will be favored, while the categorical model predicts that

a confirmation of expectations—prototypicality—will be favored. Given that empirical evidence supports both positions, though skewed towards the latter for real objects, a theoretical reconciliation was required. The "categorical-motivation model" was conceived as a merger of these two conflicting theories. Following initial attempts in the 1980s,[21] a coherent formulation was offered in 2000.[22]

The categorical-motivation model is bipolar. At one extreme are categories that largely are formed and closed to further articulation, while at the other extreme are categories that are ill-formed and open to further articulation. The concepts of "closure" and "openness" are crucial.

Closed Categories

Closed categories are of two types: those that are "wired in" and provide part of the genetic infrastructure upon which further associations can be constructed; and those that have achieved completion via learning. In the former type, it is notable that preferences exist for faces and landscapes that largely transcend cultural differences. This suggests that wired-in categories had evolutionary value and became genetically imprinted.[23] In the latter type, closed categories are existing "knowledge" structures that require no further refinement. Examples of these will be person-specific; however, and within the "cultural" domain, medieval cathedrals and Renaissance paintings are likely to be closed categories to a Western-educated audience. It is difficult to conceive of novel examples of each category emerging. In the domain of design, the ubiquitous Coca-Cola brand and Marlboro cigarettes probably are fixed, closed categories to most people, which may account for the difficulty of redesigning them while retaining their appeal. With closed categories, the more prototypic an object is of that category, the more highly it is evaluated. In the case of natural objects such as trees, apples, dogs, and tomatoes, an entire range of objects exists in which preference-for-prototypes will prevail. In other words, we like apples to look like apples, dogs to look like dogs, etc. It is known that the brain processes prototypes more rapidly than non-prototypes. With regard to closed categories, pleasure is better explained either by the speed with which we can classify stimuli or by their intrinsically wired-in desirability. Before the acquisition of language and culture, all objects would have been "natural." The brain evolved within this pre-linguistic and precultural environment. Its modus operandi did not shift to accommodate designed objects: rather, designed objects must accommodate it.

Open Categories

At the opposite end of the spectrum are categories that are open and unformed, though with sufficient redundancies such that categorization can take place: objects of maximum novelty would be unrecognizable and therefore meaningless. Examples of such open categories again will be person-specific; however, to a Western-educated audi-

20 P. Nedungadi and J. Hutchinson, "The Prototypicality of Brands: Relationships with Brand Awareness, Preference, and Usage" in *Advances in Consumer Research,* E. Hirschman and M. Holbrook, eds., 12 (1985): 498–503.

21 T. W. A. Whitfield, "Predicting Preference for Familiar, Everyday Objects: An Experimental Confrontation between Two Theories of Aesthetic Behavior," *Journal of Environmental Psychology* 3 (1983): 221–237.

22 T. W. A. Whitfield, "Beyond Prototypicality: Towards a Categorical-Motivation Model of Aesthetics," *Empirical Studies of the Arts* 18 (2000): 1–11.

23 J. F. Wohlwill, "Environmental Aesthetics: The Environment as a Source of Affect" in *Human Behavior and Environment* Vol. 1, I. Altman and J. F. Wohlwill, eds. (New York: Plenum Press, 1976); and J. H. Langlois and L. A. Roggman, "Attractive Faces Are Only Average."

ence "modern architecture" and avant-garde paintings no doubt would qualify as open categories. In the domain of design, examples could include mobile phones and computer printers. In neither case will well-formed categories exist. The clearest examples of open categories, however, derive from childhood learning, and involve the full spectrum of the recognition of objects and their associated performance characteristics. For a child, this must take place not only with natural objects, but since the advent of culture and its artifacts, with designed objects as well. The positive affective value of stimuli applicable to this area of the model would be in the further articulation of categories, the creation of "knowledge." Effectively, people see or experience something that they have not seen or experienced before, but this "new" item has enough resemblance to items already experienced that it provides new knowledge of its type—it extends the category structure. We can account for the pleasure involved in this aspect of aesthetic experience in terms of arousal. Novel stimuli generate greater arousal in their complexity of relation to other stimuli and past experience, though not too much (unrecognizable) or too little (mundane). The processing of novel stimuli ultimately results in the formation or refinement of prototypes, as the category progresses along the spectrum away from the extreme of open and ill formed towards that of well formed.

In application to design, the categorical-motivation model positions the designer in a conceptual space within the range from open to closed categories—and categories that are both person- and culture-specific. Negotiating the hurdles of delivering a designed product within this space is no mean feat. At one extreme, the powerful constraints of existing category prototypes must be contended with, and at the other extreme, the creation of categorical meaning where little or none exists.

Categorization
Given the centrality of categorization within the categorical-motivation model, it will be useful to describe it in more detail and to position aesthetics within this framework. Categorization was a major research domain within cognitive psychology in the 1970s and, given its origin at that time, formed the basis for the categorical model. A fundamental tenet of this perspective is that categorization is one of the basic functions of life—one of the elemental ways in which we form meaning. Categorization involves grouping objects together as similar, and distinguishing them from other objects. It further involves being able to identify new objects that we have not seen before, and assigning them to a category. For example, while we have seen many trees, we will see trees that we have not seen before. How does the brain recognize new trees? What are the processes involved? And, more important, how does the brain categorize them so quickly? Research into categorization tackled such problems, and provided answers in the form of inter- and intra-category

structure. Central to such structures were prototypes. These are the "best" examples of each category in that they share more features in common with other category members. In addition, the brain processes them more quickly.

We do not respond to an object per se, but rather to its position within a category structure. To place this in a design context, the function of design theory is to assist us in assimilating new material into existing category structures. Categories do not exist in isolation: they exist as interlocking and connected structures. Design theory provides linkages within our category structures that enable assimilation: in this sense, we then "understand" the new item, i.e., we can position it in terms of categorical meaningfulness. In doing so, we also extend our category structure—we expand it and articulate further connections, i.e., we therefore "understand" more.

From a sensory-perceptual perspective, the capacity to recognize (i.e., categorize), say, a dog and distinguish it from a tree is knowledge—fundamental knowledge. The ability to find one's way home is sensory-perceptual-spatial knowledge (a kind of environmental categorization), and is essential for survival—as is the capacity to distinguish between a rabbit and a tiger; after all, we eat rabbits, but tigers eat us. This is not insignificant knowledge. Sensory-perceptual knowledge is not trivial: it involves feats of highly sophisticated brain processing that we have evolved to execute with consummate ease. Because the brain has evolved to be effective, it puts little store in our ability to understand the processes. As LeDoux[24] points out, in brain processing, the conscious is the exception and not the rule. Furthermore, such sensory-perceptual knowledge is not limited simply to object recognition. Such processing goes beyond object recognition, and embraces object performance. That is why we know that trees cannot run up and bite us, while dogs can. This is not linguistic knowledge. Even dogs know this!

Research into categorization has expanded considerably since its initial focus upon taxonomies of objects and the identification of category-prototype structure.[25] Categorization now incorporates goal-derived categories, a concept put forward by Barsalou, whereby categories consist of items that do not necessarily have features in common, other than that they relate to a particular goal, such as "things to take from one's home during a fire."[26] Emotional categories[27] and intentionalist[28] categories also have been identified. The latter are pertinent to design, and recognize that the intention behind the design of an object is a further categorical variable.

Aesthetic Categories

Significantly, the debate on categorization tells us nothing about aesthetics and little about effect. Aesthetics as a differentiated category neither has been advocated nor elucidated. If we accept that there are taxonomic, goal-derived, intentionalist, emotional, and

24   J. LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life* (New York: Simon and Schuster, 1996).

25   E. Rosch, "On the Internal Structure of Perception and Semantic Categories" in *Cognitive Development and the Acquisition of Language,* T. E. Moore, ed. (New York: Academic Press, 1973); and E. Rosch and C. B. Mervis, "Family Resemblances: Studies in the Internal Structure of Categories," *Cognitive Psychology* 7 (1975): 573–605.

26   L. W. Barsalou, "Ideals, Central Tendency, and Frequency of Instantiation as Determinants of Graded Structure in Categories," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 11 (1985): 629–654.

27   P. M. Niedenthal, J. B. Halberstadt, and A. H. Innes-Ker, "Emotional Response Categorization."

28   P. Bloom, "Intention, History, and Artifact Concepts," *Cognition* 60 (1996): 1–29; and J. Levinson, "Extending Art Historically," *Journal of Aesthetics and Art Criticism* 51 (1993): 411–423.

possibly aesthetic categories, then where do we position aesthetic categories? Aesthetic categories appear neither primarily taxonomic, goal-derived, intentionalist, nor necessarily emotional; rather they appear as sensory-perceptual categories involving essentially nonverbal sensory material. An aesthetic category is intrinsically sensory-perceptual and lacking in semantic content; that is how we seem to understand the meaning of the term aesthetic. Furthermore, aesthetic categories are not fixed in terms of content— clearly they are elastic in their flexibility to absorb change (e.g., fashions).

Similarities do exist between aesthetics and emotion. A distinctive feature of aesthetics, like emotion, is that it results from an engagement with normal objects—though, like emotion, to a greater or lesser extent. There are objects whose primary function could be stated as aesthetic, such as Beethoven's symphonies, as well as objects whose aesthetic function is shared with other functions, such as the exterior styling of a new Chrysler car, through to objects whose aesthetic function is only minor. Also, there are aesthetic categories that are well formed and largely closed to further articulation, such as Renaissance paintings to a Western-educated audience, and others that are relatively unformed and therefore open to further articulation, such as avant-garde paintings. Characteristics that aesthetics shares with emotion are diffuseness and the fact that they cannot be evaluated for correctness. These characteristics indicate the degree to which aesthetic experiences are unlike cognition, and perhaps shed some light on the difficulty of describing such phenomena as "design processes" and "design thinking."

We might surmise that aesthetic categories are defined by the emotions that aesthetic experiences evoke, as has been suggested.[29] A problem is that some appear to evoke emotion, while others appear not to. For example, the "blues" may evoke emotion, but does the exterior styling of a new car? Both are aesthetic phenomena. Furthermore, if aesthetic categories are similar to emotional categories, we might assume that they share similar category-based goals. Ross has outlined the goals of emotional categories as "inference, prediction, explanation, and problem solving."[30] Thus, is emotional categorization a source of knowledge that allows us to understand and respond to our surroundings? It is contended here that aesthetics indeed does share these characteristics with emotion, but that aesthetics has the specific function of elaborating our category system via the attachment of emotion to cognition. It is further contended that aesthetics is neither essentially cognitive (as we understand it via linguistic cognition) nor emotional (again, as we understand it via linguistic cognition), but rather that it derives from a pre-linguistic-cognitive stage of human evolution—a kind of precognitive cognition. For this reason, it has proven very difficult to articulate linguistically.

29 P. M. Niedenthal, J. B. Halberstadt, and A. H. Innes-Ker, "Emotional Response Categorization."

30 B. H. Ross, "The Effects of Category Use on Learned Categories," *Memory and Cognition* 28 (2000): 51–68.

Social and Evolutionary Theories

It can be argued that aesthetics is fundamental to human life simply by observing the extent to which people design their environments. There exists a powerful drive to control the visual appearance of all artifacts, habitats, and selves. It is difficult to find artifacts, habitats, and selves that have not been subject to decoration/design, and it is virtually impossible to find manufactured objects without a designed aesthetic component. The urge to control the appearance of surfaces—color, shape, pattern, and texture—is so endemic that it cannot be overlooked.

Social theorists explain the drive to control visual appearance by contending that aesthetics serves a display function, signaling position within the social group. Effectively, material culture and its artifacts provide a coded system indicating social identity. However, evidence indicates that aesthetics cannot be fully accounted for as social construction. For example, people will respond aesthetically to stimuli that, from a social standpoint, lack "real world" applications. It has been demonstrated conclusively that people will, when presented with the most disembodied of stimuli (colors, lines, polygons, etc.), make affective/aesthetic judgments, and indeed that the task of doing so is apparently meaningful to them.

Evolutionary theorists adopt a somewhat similar, though more biological, approach as social theorists. They account for the existence and appreciation of aesthetics (essentially art and ornamentation) as a ritualistic social device or as a biological mate signaling system. The latter, in its more focused form, has even been postulated as originating in female cosmetic fertility signals.[31] These theorists tend to see the arts primarily as avenues for competitive display, to enhance status and thereby sexual selection. Unfortunately, such approaches fail to account for the diversity of aesthetic phenomena, their capacity for change, and the extent of both individual and cultural differences.

There is little doubt that a social element exists for aesthetics, and one that may also impact upon the biological function of sexual selection. The inevitable question concerns the extent to which aesthetic choices are socially, or indeed biologically, constructed. With regard to the evolutionary perspective, this paper contends that the elaborate objects we produce are not necessarily "skill displays" for mating purposes, but natural extensions of our need to attribute "good-bad" to all sensory experiences. In terms of social codification, the categorical-motivation model allows for the socially constructed realm of aesthetics. The position it adopts is that the function of aesthetics predates both language acquisition and "decoration"; effectively, it predates social organization as we understand it. However, as social organization and its artifacts arose, then the application of aesthetics to satisfy social goals would be anticipated; as would its application to the new forms of communication and display brought about by the evolution of language. Thus, the new

31   C. Power, "Beauty Magic: The Origins of Art" in *The Evolution of Culture*, R. Dunbar, C. Knight, and C. Power, eds., (New Jersey: Rutgers University Press, 1999).

medium of language has been aestheticized (literature, poetry), as has aural communication (music) and also movement (dance, ballet). Even within mathematics, that most post-linguistic medium of communication, the "elegance" and "beauty" of solutions are espoused.

Pre-linguistic Knowledge

The origin of language is pertinent to the concept of aesthetics as pre-linguistic knowledge. Disagreement exists as to the precise evolutionary origin of language. Positioning the point at which complex languages began ranges from approximately 200,000 to 50,000 years ago. The earlier estimation derives from fossil records indicating that the physiology only then was in place to enable complex language sounds to be made. The latter derives from the emergence of artifacts and decoration approximately 50,000 years ago, and has been interpreted as evidence of language-based symbolic behavior.[32] Since spoken languages leave no physical trace, the area has a long and contentious history. In 1878, the French Academy of Science even banned its discussion. However, while there is disagreement over the temporal origins of language, it is agreed that a pre-linguistic state existed. In this lengthy period of hominid/human evolution, the question of "knowing" exists. In what form did "knowing" exist in the absence of linguistic cognition? Bickerto[33] argues that language is fundamental "to all distinctively human thought and consciousness." Also, Dennett[34] considers that "thought and language are a direct product of language capacity." Interestingly, Corballis[35] recently argued that the origin of spoken language derives from visual signals: effectively, spoken language evolved as an elaboration of hand signals. This is a difficult area to investigate, given that there are no pre-linguistic survivors to interrogate and introspection has its limits. The evidence for pre-linguistic knowledge/aesthetics is circumstantial, but worthy of consideration.

Disembodied Stimuli

If little else, research in experimental psychology has demonstrated conclusively that people will, when presented with the most disembodied of stimuli (colors, lines, polygons, etc.), make aesthetic judgments. Despite reservations as to the precise interpretations made,[36] the task is apparently meaningful to them. This suggests that, for a stimulus to elicit an aesthetic response, it needs to be no more than merely taxonomic. In fact, it needs hardly be taxonomic. The popular classes of disembodied stimuli characteristic of empirical research in aesthetics (e.g., color chips, polygons) are, at most, taxonomic. However, these are not objects in the accepted sense: rather, they are attributes of objects, the building blocks from which objects are constructed within perceptual cognition. Furthermore, as categorical entities, they clearly lack "goal-directedness." For example, polygons hardly would qualify as "things to take from one's home

32 C. Holden, "No Last Word on Language Origins," *Science* 282 (1998): 1455–1458.

33 D. Bickerton, *Language and Human Behavior* (Seattle: University of Washington Press, 1995).

34 D. Dennet, *Consciousness Explained* (Boston: Little Brown, 1991).

35 M. Corballis, "The Gestural Origins of Language," *American Scientist* 87 (1999): 138–145.

36 T. W. A. Whitfield and T. J. Wiltshire, "Color Psychology: A Critical Review," *Genetic, Social, and General Psychology Monographs* 116 (1990): 385–411.

during a fire."[37] Similarly, they have no "intentionalist" identity:[38] no one makes polygons. And from a social standpoint, they lack "real world" anticipations of outcomes: as such, they are incapable of generating actual or conceived preferences. The social determinist explanation offered for "real world" objects, therefore, cannot be offered for "disembodied" stimuli. Polygons, after all, have no signifier status and offer little opportunity for "conspicuous consumption": no one buys or covets polygons. Significantly, however, the fact that people will make affective/aesthetic judgments of such anodyne, meaningless stimuli is interesting. If such socially and cognitively impoverished stimuli can elicit aesthetic appraisal, then it is plausible to assume that all stimuli can.

The "Mere Exposure" Effect

In what is now a classic study, Zajonc[39] demonstrated that, by simply showing people what to them was a meaningless object, a Chinese pictogram, that it influenced their preferences when shown a range of similar pictograms. The pictogram previously seen was more likely to be preferred, even though subjects in the experiment could not remember seeing it. Zajonc's results have been independently replicated more than two hundred times.[40] This effect indicates that positive aesthetic responses to an object can be induced by "mere exposure"—an effect that advertisers have intuitively recognized. Interestingly, Zajonc took this a step further by preexposing people to a pictogram for such a short interval (milliseconds) that they actually saw nothing.[41] The same effect was observed. When asked to explain their preferences, people gave various reasons to do with the design properties of the respective pictograms—all clearly spurious. The significance of this research is that it demonstrates that "liking" something does not even require perceptual cognition. Not only could people not remember seeing the preexposed pictogram, *they didn't actually see anything.* This raised the obvious question that, if the perceptual/cognitive system did not see it, then how did the brain detect it. After all, the preexposures generated an aesthetic liking. Something in the brain must have seen it, but what and how?

The answer to this intriguing question began to emerge very recently from the field of neurophysiological research. LeDoux,[42] among others, has demonstrated that a part of the midbrain called the amygdala has a direct, "fast-track" connection to the eye. The amygdala picks up information more quickly than the cognitive system, and even detects information that the cognitive centers cannot, as in the case of Zajonc's preexposure studies. However, and significantly, the amygdala is an emotion agent. It attaches emotion to incoming information, both positive and negative, and relays this to other parts of the brain including the cognitive centers. Significantly, it also is a powerful and primitive agent, strongly implicated in experiences of fear and pleasure. One of its functions is to

37 L. W. Barsalou, "Ideals, Central Tendency, and Frequency of Instantiation as Determinants of Graded Structure in Categories."

38 P. Bloom, "Intention, History, and Artifact Concepts."

39 R. B. Zajonc, "Attitudinal Effects of Mere Exposure," *Journal of Personality and Social Psychology* (1968, Monograph Supplement 9): 1–27.

40 R. F. Bornstein, "Exposure and Affect: Overview and Meta-analysis of Research, 1968–1987," *Psychological Bulletin* 106 (1989): 265–280.

41 R. B. Zajonc, "Feeling and Thinking: Closing the Debate over the Independence of Affect" in *Feeling and Thinking: The Role of Affect in Social Cognition,* J. P. Forgas, ed. (Cambridge: Cambridge University Press, 2000).

42 J. LeDoux, "Emotion and the Amygdala" in *The Amygdala: Neurobiological Aspects of Emotion, Mystery, and Mental Dysfunction,* J. P. Aggleton, ed. (New York: Wiley, 1992); J. LeDoux, "Cognitive-Emotional Interactions in the Brain" in *The Nature of Emotion,* P. Ekman and R. J. Davidson, eds. (Oxford: Oxford University Press, 1994); J. LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*; and A. R. Damasio, "A Second Chance for Emotion" in *Cognitive Neuroscience of Emotion,* R. D. Lane and L. Nadel, eds. (New York: Oxford University Press, 2000).

"modulate cognition with emotion."[43] Perhaps most significantly, we have no conscious access to the actions of the amygdala. We cannot introspect and ascertain its workings. Why? From an evolutionary standpoint, the emotion system has features that alert the organism for swift action. To be subject to introspective analysis was clearly irrelevant: the trade-off for accessibility was speed. Detailed processing is time-consuming.

From the standpoint of categorization and aesthetics, the "modulation of cognition by emotion" is not something that we consciously control. It happens to us: we do not make it happen. It is simply not important to the brain that we have access to this. And this is true for the actions of designers with aesthetics. This is not to suggest that they are incapable of providing some insight: rather it states that much probably will be inaccessible to them. This may account for the difficulty of analyzing the processes by which designers arrive at a design, and why a scientific approach to design may be implausible.

Synaesthesia

Synaesthesia fits well within the model of pre-linguistic cognition. It is the phenomenon whereby sensory experience "crosses over" between different senses. The most common form of this is "colored hearing." People with this form of synaesthesia see colors while hearing particular sounds. Synaesthesia probably is evolutionarily older than ontologically separate sense perceptions, and certainly would have occurred before the advent of language.[44] The function of synaesthesia might have been to provide additional cross-modal sensory information about the environment in a more efficient way than completely separate sense perceptions. Some have argued that synaesthesia is a part of normal limbic system functioning of which we are unaware, while others maintain that it is an ability that, interestingly, recedes into latency with the child's development of language.[45]

A number of cross-modal sensory associations remain in a weaker form of synaesthesia. This is most evident in the association of color (vision) with dimensions such as warm/cool (touch) and loud/quiet (hearing). It even has been argued that synaesthetic perception lays the foundation for the development of analogy and metaphor as expressed through language. Williams, in his analysis of the development of the English language, contends that not only do inappropriate metaphors not hold (i.e., they drop out of use remarkably quickly), but changes in word usage develop from "the physiologically least differentiating, most evolutionarily primitive sensory modalities to the most differentiating, most advanced, but not vice versa."[46] For example, the word "sharp" was first applied to touch, followed by taste, and finally hearing and visual shape. Significantly, this development does not occur in reverse order.

43 J. LeDoux, "Cognitive-Emotional Interactions in the Brain."

44 R. E. Cytowic, *The Man Who Tasted Shapes* (London: Abacus, 1998).

45 L. E. Marks, *The Unity of the Senses* (New York: Academic Press, 1978).

46 J. M. Williams, "Synaesthetic Adjectives: A Possible Law of Semantic Change," *Language* 52 (1976): 464–465.

If we discount the strong form of synaesthesia as an adult rarity, we are left to explain the weaker, associationist form as an apparently universal phenomenon. This appears to be a residue of the strong form, and one that no longer serves any apparent purpose. For example, what now is the advantage of associating apparent temperature (warm-cool) with color? Similarly, for melody, what purpose is now served by our capacity to store and remember such synaesthesia-laden sound sequences as in *Für Elise*? Why are these sound sequences apparently meaningful to us? Do aesthetic categories derive from this cross-modal, sensory-perceptual domain? Do they exist for articulating cross-modal sensory associations—experiences that are not linguistically accessible? Before the development of language, and at an early stage of the species' cognitive development, the capacity to cross-articulate sensory modalities would provide additional sensory-perceptual knowledge.

Theoretical Implications

A key feature of the categorical-motivation model is that it conceives of aesthetics not as an "artistic" aspect of design, but rather as a fundamental process for acquiring and creating knowledge—pre-linguistic knowledge. In line with this, it rejects the post-Baumgarten view of aesthetics, and adopts the classical Greek notion of *aisthêsis* as sensory-perceptual knowledge. The core concept is that categorization involves pleasure. In the context of aesthetics, it is posited that the assimilation of new information to extend, refine, and elaborate the "categories-in-relation" also involves pleasure. The modulation of categories leads to greater fitness for purpose. What we now term "aesthetics" was the modus operandi of understanding the external world.

The function of aesthetics appears to be to elaborate our category system via the attachment of emotion to cognition or, to use LeDoux's phrase once again, the "modulating of cognition by emotion." These combined cognitive-emotion categories are what Damasio [47] refers to as "somatic markers." The stored cognitive/ emotional knowledge enables us to anticipate how the effect of possible alternative decisions would "feel," and thus to employ the somatic markers as aids to decision-making. [48]

The categorical-motivation model acknowledges the sensory-perceptual as the dominant form of knowledge, and the intellectual/linguistic as an evolutionary add-on. It should be borne in mind that the hominid/human brain evolved over more than three million years. It invented language between 200,000 and 50,000 years ago. Language is an add-on to a highly sophisticated sensory-perceptual-emotional system. It does not replace the system: language simply provides additional processing resources that the original system found useful. Language is not essential for survival: sensory-perceptual-emotional processing is. In privileging language-based knowledge, we perpetuate Descartes's delusion of

47 A. R. Damasio, "A Second Chance for Emotion."

48 G. Lindgaard and T. W. A. Whitfield, "Integrating Aesthetics within an Evolutionary and Psychological Framework," *Ergonomics* (Special Issue: "Theoretical Issues in Ergonomics Science") (in press).

"I think therefore I am." Damasio powerfully undermines this from a neurophysiological standpoint.[49] Also, in privileging the cultural in the form of object analysis, we overlook the more fundamental processes that underpin knowledge as sensory-perceptual phenomena. A hierarchy of knowledge exists from the sensory-perceptual to the linguistic, and from this to the cultural. The cultural is rather like the tip of the iceberg, with the fundamental sensory-perceptual knowledge structure underpinning it.

The categorical-motivation model accommodates the cultural domain as an add-on involving the social meaning of designed objects within a given cultural setting at a particular time. Equally important, however, the model moves away from a reliance on purely linguistic and deconstructive modes of understanding. For those who are reticent in accepting the absolute hegemony of language common to much contemporary theorizing, it provides an alternative perspective. And this perspective acknowledges the human brain and its processing strategies as the fundamental agent determining our understanding and evaluation of the world. It is surprising indeed that no less an object than the human brain appears to be overlooked in the construction of design theory.

Perhaps the main implication of the categorical-motivation model for designers is that they share with artists a concern for adding to our sensory-perceptual knowledge. They do so by a process of refinement, elaboration, and construction of a range of sensory-perceptual phenomena. "Knowledge," in this context, refers to new sensory-perceptual experiences that designers are adept at creating. This is achieved by the interweaving of new variants of category knowledge within the constraints of existing category knowledge. Martindale represents this rather neatly in a neural network model involving the hedonic activation of cognitive units. Within this, stimuli that are more prototypic generate greater cognitive activation than less typical stimuli. In application to aesthetic experience, this has evolved into a multifaceted model involving activation of a range of "sensory, gnostic, semantic, and episodic analyzers."[50] This is the domain in which designers and artists operate. Within this, the concept of "knowledge" is appropriate. The notion of "intellectual," as in the "intellectual content of the design," is a misnomer. "Intellectual" has the hallmark of linguistic cognition: it deceptively leads design into something that it is not, while overlooking the significance of what it is. Does design aesthetics need the imprimatur of the apparently intellectual? Does *aisthêsis* need justification from *noêsis*?

49 A. R. Damasio, *Descartes's Error: Emotion, Reason, and the Human Brain* (New York: Grosset/Putnam, 1994).

50 C. Martindale, "Aesthetics, Psychobiology, and Cognition" in *The Foundations of Aesthetics, Art, and Education,* F. H. Farley and R. W. Neperud, eds. (New York: Praeger, 1988).

An Interview
with Morteza Momayez
Shahriar Sarmast

Design Issues *is pleased to publish this interview with Iranian graphic designer Morteza Momayez recently conducted in Tehran by Shahriar Sarmast. Morteza Momayez, Iran's foremost graphic designer, has been active in the field for more than fifty years. When he began his career in the early 1950s, he designed Iranian newspapers and magazines. In the 1960s, he completed a degree in art at the University of Tehran, and did further studies in Paris. Mr. Momayez is the author of numerous books on graphic design in Farsi, and his work was featured by F.H.K. Henrion in his book* Top Graphic Design *(1983). Shahriar Sarmast is an art director in Tehran, and currently is Secretary of the Iranian Graphic Designers Society. Mr. Sarmast created the cover for the Summer 2002 (XVIII: 3) of* Design Issues.

Victor Margolin

Sarmast: Dear Momayez, I would like to begin this interview with something I have always wondered about. Why is it that, when the topic of graphic design in Iran is raised, only one name comes into discussion—yours. I recall my first contact with the American design historian, Victor Margolin. Yours was the one name he mentioned when he made reference to graphic design in Iran. I have had the same experience with several other people. There are several other pioneer designers from your generation with considerable artistic backgrounds. Does your strong name recognition come only from your artistic values, or is it partly because of your social behavior and personality?

Momayez: I don't really know what I can say. I never encountered such a question. But now when I think of it, I believe my personality and social behavior developed very naturally and unconsciously. Honestly, I think of myself as a very ordinary and straightforward person with a plain personality. I always tried to adapt myself to the people and situations around me. I take my work and profession very seriously, and try hard to achieve whatever I believe in. I also try to be frank and straightforward with people. I never planned or designed any personality or behavior for myself. Everything has come naturally.

Sarmast: Undoubtedly, your behavior and approach have brought you success and achievement. This special behavior has been taken as some kind of aggression, and maybe an authoritarian attitude, by some people (if you will excuse my impression).

Please tell me, is this kind of approach related to your nature or is it some kind of strategy you have chosen in order to achieve your own ends? Surely, you have done things that you believed to be right. This can be observed in all of your work.

Momayez: One can easily see decisiveness and explicitness, or some kind of frankness, in my work right from the beginning. These qualities are parts of my nature and character. Pretentiousness or false gimmicks really are a waste of time.

You can sustain a false character for a while, but eventually your real character or nature will show through. I am willing to listen to very harsh criticism about myself. I am always open to suggestions and always consult with others before making a decision, which is why I consider myself a conservative person, at least in social matters. I think this nature comes from my teaching background. A teacher, lecturer, or whomever deals with students should be very patient. That is the only way to discover and develop the latent talents that are hidden inside one's students.

Sarmast: I really can't put these two together, but I gather that you agree with this attitude to your approach. The difference is that you take it as frankness and decisiveness, which is part of your nature, instead of a demonstrative offensive, an approach that helps you fulfill your desires or get whatever you are after. I don't mean personal desires, but mostly social ones in favor of your profession. I also want to recognize a very strong element that runs through your life's work. We can call it global or international. From your earliest projects, one can recognize a visual language that is intended to communicate with a wider audience around the world, rather than a limited one. Despite the old argument about an Iranian visual

Figure1
Logo with Farsi calligraphy, 1970s,
Reza Abbasi Museum.

All figures courtesy of Morteza Momayes.

Figure 2
Self-promotional poster, Morteza Momayez,
designer (calligraphy at bottom, 1970s).

language in graphic design, I feel you that you always have searched for a wider horizon. What do you have to say about this?

Momayez: I think this goes back to my roots. I did not come from a well-off family. What caused others to consult my father, and what made my parents trustworthy within their own circle, was their attitude. My father never thought that success would come through wealth. He strongly believed that real virtue is having a wide horizon and an expectation from life, as well as the capacity to realize that expectation. He believed that you should work hard for whatever you want to achieve, and not settle for second best. This attitude became my guideline, and I still follow it in my daily affairs. Such an attitude also brings magnanimity to a person. To be this way gives me joy.

Sarmast: This also might bring extravagant ambitions if maturity didn't prevent them. But now let me question you from a different angle. In the field of graphic design from the early days up to now, which is the age of high technology and information, there have been some unchangeable bases, essentials, qualities, and skills that any graphic designer would need in order to enter the professional world. These are: a general knowledge of visual art, artistic talent, creativity, academic knowledge, or the understanding of academic rules that include composition, perspective, and color combinations; good drawing skills, and, finally, the ability to achieve a personal style or visual language. In graphic design today, some of these principles and skills have lost their value either because of new technology, such as the computer, or because of new styles and a new logic, which even affects the basic rules of composition, lay out, and good color combinations. What do you think about this?

Momayez: Of course, new ideas and media establish their own grounds. Along with this, new progression, the old meanings, terms, and tools gradually lose their power and some of their ability to meet the new requirements of the contemporary world. This relates to mankind as well. Being unable to understand time, and today's visual language and tools, makes it difficult for people to move ahead. This doesn't mean farewell to the past. The old values and achievements have survived through centuries and remained as a stable ground for new achievements. No one can move ahead unless they rely on, and make good use of, past experiences.

Sarmast:: Sorry to interrupt. I understand that you take the old rules, principles, and tools as some kind of capital to invest in new achievements.

Momayez: That's right. You see, people and things continually change all the time. This is because no one and no thing is ever

Figure 3
Editorial image for an article about
traditional wrestling in Iran, early 1960s.

Figure 4
Illustration for a book cover, *anti-memories*,
late 1960s.

perfect or absolute. That goes for the younger generation as well. Young people are more up to date, energetic, and sometimes more talented than their elders, but soon they become part of the more experienced and mature past and new people take their place. This happens all the time and occurs so fast that the young people don't realize it. (Maturity and experience are good values, but they don't always provide what we need for the present. Still, I evaluate the present by the values and guidelines that belong to the past. This attitude at least helps me to maintain to some kind of optimism toward the new generation and new rules and values.

Sarmast: Dear Momayez, the best I can say is that you answered part of my question, but gladly enough you also mentioned a few other points that clearly demonstrate your attitude to the world around you. My next question relates to your current professional activities. It seems that you have changed your creative language in the last few years. You always have been creative in different ways, but in recent years you replaced your direct artistic creation with some kind of indirect creation. You have been spending your time and energy on projects that not only affect a limited audience, but affect the society of artists and designers as a whole. You have planned and organized nationwide exhibitions and biennials, and other cultural movements and happenings, and most important you have engaged in beneficial activity for the design profession in Iran. You established the very first professional organization for Iranian graphic designers, for example. Such moves are not only creative, but also beneficial for the present and future of graphic design in Iran. It is undeniable that this recognition of graphic design in Iran and the considerable growth of the Iranian Graphic Designers Society are partly because of the considerable time, effort, and energy that you did put into these activities. What is the reason for this change, and what do you have to say about it?
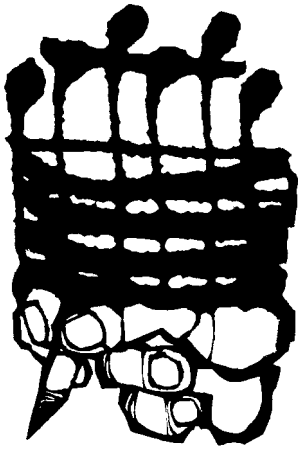
Figure 5
Illustration for book cover, *Links between Music and Literature*, 1970s.

Momayez: What I never forget to do is to estimate my abilities. These include my ability to understand circumstances and the ability to understand and adapt myself to the present time and to know whether I am asleep or awake. People usually relate age with weakness of mind, sense, and a lack of energy, which adds up to some stage of dumbness (if I may say so). In one word, some people misunderstand age. For many people, getting old means getting weak, but this has another meaning, which is maturity.

When I first entered the field of graphic design, I found it had something of an isolated nature, at least in Iran. It was a profession or way of communication that only covered a limited group of people. That is why I decided to break this line and to address a wider group. I decided to teach, and through teaching, to communicate with a greater audience of students and young artists and designers. This was useful because I had to organize and categorize the knowledge I had in order to pass it on to my students. But after years of practicing, I found out that teaching wouldn't fulfill my expectations from life. Teaching and lecturing are valuable when you can pass on your new discoveries and creations to your students. Otherwise, you get bored. On the other hand, art students are not the only interested and qualified youngsters you can reach. There are a lot of other talented people who can use support. For this reason, I decided to pass on my experience by publishing books. My posters, illustrations, and book covers are some of the works I tried to analyze in order to set forth some theory or academic points in my books. In these books, I tried to reach a wider range of people interested in graphic design. Following this work, I came across another important need for graphic designers in Iran. Staying socially and professionally isolated, and not being recognized through some kind of professional organization, was not the solution. So I stepped forward to establish a design organization with the help of some other colleagues. The Iranian Graphic Designers Society (IGDS), founded in 1997/98, took considerable steps in favor of our colleagues. IGDS is the only Iranian NGO in the design field. Through these years of working hard, we have been able to create a stable identity for the graphic design profession within our society, along with many other achievements. That was not an easy job in a country such as ours. Yes, I also see these initiatives as creative attempts, but they arose from a natural desire and I am glad I undertook them.

Sarmast: Mentioning IGDS brings up the fact that your social attempts in addition to your considerable artistic background put you in a position of custodianship for graphic design in Iranian. The direction and innovation you have brought to graphic design has been successful, and I am glad, as are many other colleagues in IGDS. But sometimes there are some questions. Here is an opportunity for you to describe your reasons for putting so much time, effort,

Figure 6
Key frame picture for an animation film,
1960s.
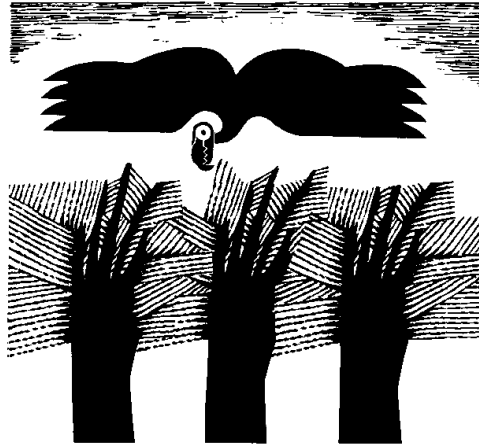
and hope into this society, which I feel you have taken as the most important social mission in your life. Please tell us more about this.

Momayez: What I can add to what I said previously is that what my colleagues and I have started is somehow an experience related to the local situation and possibilities. It might not be the only way to establish a professional identity for graphic designers, and look after their social benefits and rights as a group.

Now it is up to other designers to step in and try other ways. All these attempts end up improving the position of graphic design and designers as a whole, and not as separate individuals.

Sarmast: I will put aside many questions that I wanted to ask, and will finish this interview with a simple question that may be difficult to answer. I am asking you as a world-renowned graphic designer, who is practicing in a not-so-international society, "What is graphic design?"

Momayez: As you mentioned yourself, answering this question seems to be easy. When you check out "design" in different encyclopedias, you can see how accurately it's explained. But is that enough? I think that each designer has his or her own definition of this word, based on personal experience and field of practice. Their understanding of this word relates to their knowledge in this field. In one of your previous questions, you pointed to a new understanding and a new field of practice in graphic design. That is right, and that's why I think we should expect people to rely on their own understanding of this word. Why not put this question to your readers. Ask them: "What is graphic design?"

Sarmast: Thank you very much for your time.

Outside the Center:
Defining Who We Are
Sherry Blankenship

Globalization promises a unification of the world that strengthens the similarities between peoples and cultures, improves communication, and minimizes the differences. In reality, it has been perceived as a vehicle of westernization; it has provoked resistance and the defense of distinctive cultural practices and heritage. Regardless of whether one is an advocate or a critic, globalization has unleashed or accelerated cultural exchange and transformation. Our efforts to describe the dynamic processes through which elements from one culture pass to another are undermined when we employ interpretive frameworks that are crude and increasingly inadequate. In addition to concerns with cultural survival, environmental survival has emerged as a key concern in the age of globalization. While design is deeply implicated in the problems of globalization, my experiences in teaching design around the world have convinced me that design, though often seen as a luxury for the few, can contribute to the elaboration of new and better solutions and frameworks. This essay is an effort to identify ways that design can become an active force in extending its role in the sustainability of culture by reflecting and representing the respective peoples and places in which it is working—by defining and dispersing itself in many locations rather than perpetuating its present predominantly Western centrality.

The situation is now one in which both designers and clients need to consider development in terms of sustainability.[1] Design, which utilizes essential aspects of cultural identity, can serve to synthesize the past with the present for the benefit of the future. This process could then assist the design profession to determine which changes are destructive or sustainable so that designed spaces, practices, technologies, narratives, and identities can remain integral to society. The practice of design might then become a critical aspect of the establishment of a sustainable condition with consideration to the history, tradition, and identity of culture. The outcome of these processes might lead to confident identities, resilient and capable of sustaining cultural norms, meanings, values, and traditions.

I have been involved, through teaching design, with cultures from the South Pacific, Asia, the Middle East, and Africa. My purpose here is to examine some of these experiences during the past decade that suggest possible directions, potential solutions, or at least illustrate a range of changes that directly impact upon design and design education. It is my hope that some of these examples might

1 Sustainablity has become readily connected with environmental issues but the same intention is used here within the context of cultures. The idea of sustainability is to keep something in existence by providing support for it, by upholding its validity. In this article, I use it as part of a process of developing both an awareness of and a responsibility to identify, maintain, apply and even transform aspects of a culture's unique visual language so that it is not totally lost or subsumed by outside influences.

Figure 2
A student design interpreted the use of
signage and found typography in a New
Zealand neighborhood.

empower designers to take an active role in the future direction of
the profession, not simply to oppose the effects of globalization but
to work toward the creation of alternatives within the political,
social, economic, and cultural aspects of assimilation.

I have found five factors that work toward building cultural
self-esteem. They simultaneously improve design and lead to an
awareness and acceptance of their value by business, government,
and other users. They can be summarized as:

1. Awareness of the local/personal culture
2. Valuing visual traditions and folklore along with an under-
   standing of their impact/influence on contemporary design
3. Exhibiting confidence that leads to less dependence upon
   an imitation of large, dominate cultures, and which allows
   the emergence and integration of local aesthetics
4. An increase in publications that promote local design and
   recognize individuals who serve as role models for young
   designers
5. A vision for the future.

1. Awareness of the Local/Personal Culture
A little more than ten years ago (1993), most New Zealand designers
denied that New Zealand had an identity of its own or, thought that
if one did exist, it was too shameful to exhibit. By 1999, they had
begun to recognize their uniqueness. They were less likely to imitate,
however badly, design from Australia, the U.S., or Europe, and were
creating their own aesthetic that had been transformed by local
design community. Acknowledging the paucity of their built past,
they began to look to their geography and environment for inspira-
tion. Design students began searching for evidence of the recorded
history which eventually led to exhibitions and publications about
aspects of a distinctively New Zealand design history. Much of this
development was achieved because of the changes in the design
education programs that encouraged the students to initiate projects
with in-depth research components. Students and educators began
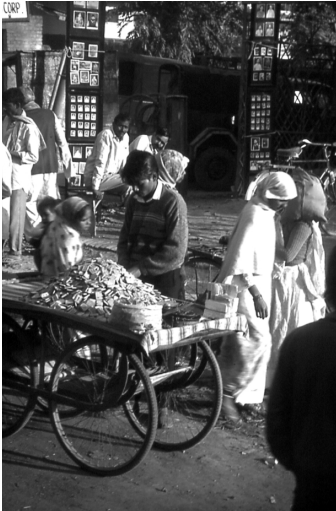
Figure 3
A vendor in India sells biscuits individually from his wagon.

to recognize the uniqueness of their experiences, and take pride in them. These factors allowed them to reevaluate their own design traditions, and to bring them into the present, where their value and meaning were no longer eclipsed by globalization. In fact, new titles written by New Zealand designers about New Zealand design have begun to emerge.

2. Awareness of the Impact of Visual Traditions and Folklore on Contemporary Design

India (1996)—an ancient culture rich with religions, languages, crafts, and arts—has had many experiences with Western values due to its colonial history, as well as through current advertising, TV, movies, and tourism. Indians have been seduced by the West, and often view the imitation of the West as the hallmark of success. There are economic aspects of Western-style capitalism to be envied and enjoyed but, ideally, not at the expense of losing the folklore and traditions of the past.

The school where I taught began in the 1960s with a curriculum developed by consultants from the West. There was little consideration for the Indian culture, since the curriculum was based on what had been done in Europe and the U.S. with the modernist assumption that design was universal, and therefore the people of India were assumed to have the same needs and understandings. Recently, the school has begun integrating many of the local crafts into the curriculum, as well as requiring students to work for one semester in a setting where they use design to improve the lives of the local people.

I conducted a course, Indian Design for Print in the West, which indicated the obvious desire for an economic link between their design and that of the West. Within the course, students explored their personal relationship to India, first by finding an object that symbolized India to them. They then began to explore their objects as a means for developing a design which encapsulated their perspective of an Indian ideal. The final designs ranged from an identity for a tribal theater group on the border of Tibet to the "Bollywood" interpretation of women to an illustrated cookbook from Kerala in the south. There was no consensus about what was truly Indian, but each student found expression for a personal and local sense of who he/she was, and was able to defend it through numerous heated discussions and critiques.

The discovery of an identity is not easy. Most countries are diverse in many ways, whether through race or religion, or geography or traditions, but even among these differences a core of similarities exists whether the country is large or small. The U.S. and Europe are not totally homogeneous, but the visual work retains characteristics that we easily identify or categorize. The difficulty lies in the recognition and understanding of fundamental characteristics
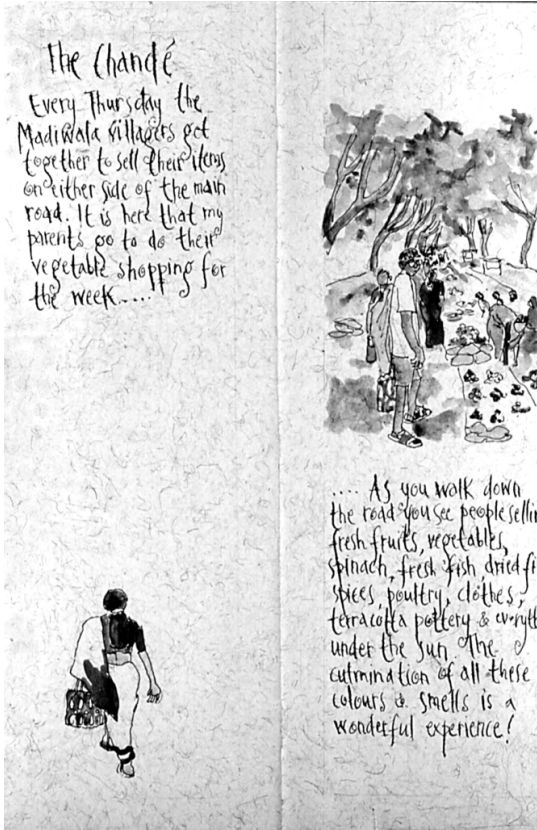
Figure 4 (left)
A double-page spread from a student's cook-book in which he illustrates Indian life through stories and family recipes.
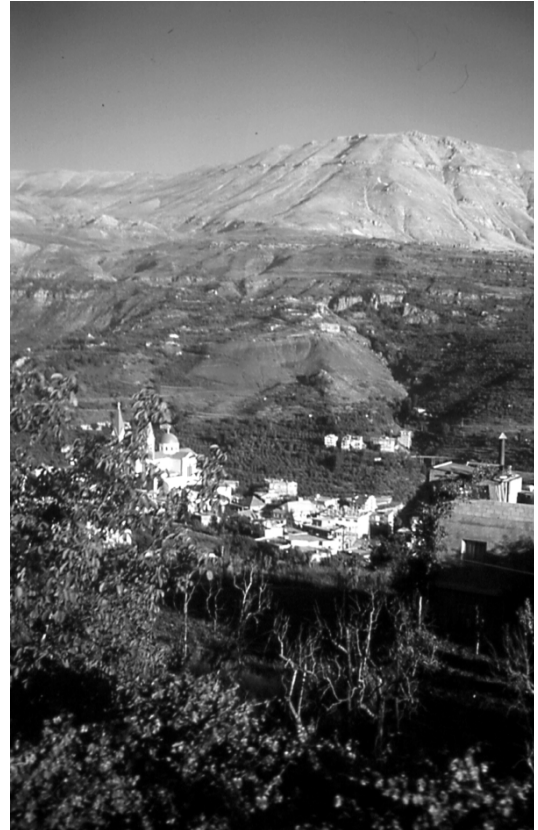
Figure 5 (right)
A village set in the mountains of contemporary Lebanon.

that communicate the essence of a people and a place, not the senseless repetition of hollow motifs. The former is most difficult; the later becomes superficial and disposable.

3. Less Dependence upon Imitation of Large, Dominant Cultures with the Emergence and Integration of Local Aesthetics
Lebanon (2002) often is described as the place where East meets West. Indeed, Beirut is in a receptive location on the coast of the Mediterranean where, for millennia, invading forces have left their mark. But it is this very particular interpenetration that has resulted in a unique combination of cultures that differs from any other place on earth. The unique nature of this heritage is not easy to recognize, since it often results in utter chaos, but beyond that chaos is the true nature of the Lebanese identity.

Like the New Zealanders, the Lebanese often negate or deny what is uniquely theirs. The East assumes the subservient role. Most Lebanese designers would even deny that there is any such thing as a specific visual identity. Yet, theirs is a very complex, intricate, multilayered experience which has yet to be investigated. Because of the length of the civil war, the breakdown of the infrastructure, and a failing economy, Lebanon faces a massive challenge to retain what little remains, and to redirect energies internally rather than

"Thou shalt not fornicate."
"It's that simple"

externally. Local designers have begun to understand that any country can imitate Europe or the U.S., but only Lebanon can work to retain what it has and establish greater pride in the local folklore and culture.

Design students and design curricula are beginning to take an interest in this process, even if they continue to doubt that it is possible. Courses in some of the local design programs encourage students to initiate projects and to do research. Although they continue to embrace Western standards, more and more students strive to understand their past, and are becoming willing to confront the taboos or controversial subjects within their culture.

4. An Increase of Publications that Promote Local Design and Recognize Individuals Who Serve as Role Models for Young Designers

During a workshop in Istanbul (1999), I asked students to consider what it was like to be outside of the centers of design. To my surprise, the Turkish students felt that they were at a center of design. They were rather surprised that I didn't know this. They were at least geographically closer to recognized centers than any of the other students I had taught.

I soon realized that there were some critical differences between the experiences of the Turkish students and those in New Zealand, India, and Lebanon. Although they looked to Europe for both design trends and celebrities, they also had some of their own who were able to incorporate into their own visual language their sense of time, lettering and illustration traditions, icons from shop signage, traditional food and parts of Ottoman architecture. They were knowledgeable about national designers and their work because of local conferences, exhibitions, and a vital professional organization. These factors offered a critical difference—Turkish students recognized and celebrated the Turkish designers within their own country. They tended to name David Carson or Neville Brody as their favorite

Figure 7
The Blue Mosque, one of the architectural icons of Istanbul, is particularly resplendent with springtime flowers.

designers, but also had a long list of Turkish designers that they held in high esteem.

This awareness is possible because the Turkish design profession has recognized the need for, and benefit from, publishing and promoting their own designers, while designers in other countries leave it to dominant countries to provide their standards. This lack of local material forces their students and professionals to look to foreigners and foreign styles, because they are the only design publications available to them.

Even though my Turkish design students had never considered their own culture as worthy of investigation and, when they began the workshop, were at a loss as to what to explore, their innate pride in their heritage eventually enabled them to see what had influenced the particular style of design practiced in their country. They used humor; they investigated the vernacular and popular culture; and they began to see how many of traditions of the street, of the shops, and of the home had contributed to their contemporary designs.

5. A Vision for the Future

In Zimbabwe (2000), I was overwhelmed by the confidence of the students who live in the shadow of the larger, more established design culture of South Africa, and look to it just as other countries might look to the U.S. or Europe. As in Turkey, these students have local role models who inspire them. They also have a new school, the Zimbabwe Institute of Vigital Arts (ZIVA), established by Saki Mufundikwa, a Zimbabwean who went to the States for his education and professional work, but returned to his own country to give something back. So here was more than a role model—here was a person with whom the students could interact as a teacher, a friend, and a colleague within the local design community.

Despite a multitude of problems in starting the school—finances being the primary one, and the deteriorating political situation another—Mufundikwa's philosophy serves as a valuable model for design education in the future. He explains that the mission of ZIVA is to create a new visual language—a language inspired by history, a language that is informed by, but not dictated to or confined by, European design, and a language that is inspired by all of the arts (sculpture, textiles, painting, African religion)—a language whose inspiration is African. His is a clear articulation of the same message that I see emerging worldwide.

Young designers are rejecting the straightjacket confines of the Western world. They are rejecting the judgment of their works by Western standards which may precipitate new criteria for evaluating the effectiveness of their designs. What has the corporate style of the West contributed to people whose existence and environment has nothing to do with those experiences? In order to work toward

sustainability in design, we need to introduce new ways of think-
ing about design, new ways of looking at the world around us that
encourage new visual languages.

The previous examples suggest a growing desire and aware-
ness on the part of many design educators, design students, and
design professionals to create and use such visual languages based
on their own cultures and experiences—languages which are authen-
tic, enriched, and diversified. Each culture and, with it, each designer
has valid experiences upon which to build a visual language that
reflects the flash of the human spirit by which the soul of a culture
reaches into the material world.

While writing this article, I attended and participated in a
design conference at Virginia Commonwealth University's Qatar
Campus that focused on the theme of cultural sustainability. The
speakers, most of whom had connections to the Middle East through
heritage, education, and/or work experience, repeatedly stressed the
acknowledgment of their background as a significant force in their
work. The influence of their culture through their memories and
senses informed their work, and served as a treasury of inspiration
that contributed to their success as designers. They also acknowl-
edged that each of us needs to maintain our individuality despite the
influences of passing fads and imported styles. Each of us, with our
own cultural heritage, can enrich the worldwide cultural exchange
rather than imitate it.

The challenge then is to identify aspects of our cultures
that need to be maintained in order to ensure a meaningful future.

Design should not focus only on the artifacts and communications it produces, but also serve as a guide for the sustainability of cultures for the future.

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Thinking Re-Vernacular Building
Carl Mitcham

This short reflection was inspired by experiences of building and thinking. In homage to thinking, it begins with a fugitive reading of Martin Heidegger's "Building Dwelling Thinking." In homage to building it concludes with my story of constructing a house on the eastern slope of the Rocky Mountains in southern Colorado, the place that I would make home. Along the way, and in the references, homage is offered to a number of other inspirations for a recovery of what Christopher Alexander calls "the timeless way of building" but might also be termed the conscious vernacular.

As Stewart Brand has noted, after farming, building is the second largest industrial activity in the world. Like farming, building is being torn loose from its rootedness in the earth. What can one do to re-root building, in a way comparable, say, to the way the organic farming movement attempts to re-root farming? Why should one even try?

The ageless way of building is at once unthought and vernacular, although there is no equivalence between lack of thinking and the vernacular. The un-scientifically thought but deeply lived act of building must to be rediscovered, perhaps in a new kind of thinking. To think building is most commonly to think non-vernacular building—modernism and efficiency, postmodernism and fun, and more. Is it possible to think the non-vernacular in a way that constitutes a recovery of the vernacular as something more than scholarship or antiquarianism? Could there be a meta- or post-nonvernacular that is re- (in the sense of "really") vernacular?

After "Building Dwelling Thinking"

In his essay "Building Dwelling Thinking," with its three titles laid down like stones on a path, Heidegger begins abruptly. Suddenly, seemingly out of nowhere, he begins to speak, and in his written speech to reverse the order of what has been laid down, saying that he wants to think dwelling and building. The essay is, in fact, divided into two sections—the first on dwelling, the second on building—followed by an epilogue reflecting on what happens when these two are set down side by side.

In the initial section, Heidegger notes how, in contemporary parlance, we distinguish between those structures, such as houses, which are dwellings, and those, such as bridges and stadiums, which are not. What is distinctive about dwellings is that human beings are at rest within them. Nevertheless, Heidegger notes, in a more expansive sense humans are at rest also within structures, because

they play out their lives as a whole going about their business by traversing back and forth across bridges, attending to games in stadiums, and more. In this sense dwelling is the end of building, the means.

But in a deeper sense, building is already itself a kind of dwelling—an end. Humans not only are at rest within dwellings, they are and find themselves in building. In their dwelling they build. This is revealed, as often is the case with Heidegger, through attending to language. The German word *bauen* (to build) is etymological related to certain forms of the verb *sein* (to be), as in *Ich bin* (I am), or *Du bist* (you are). Indeed, according to Heidegger, *Ich bin* may even be translated not as "I am" but "I dwell." Understood as building, moreover, *bauen* also, and in the first instance, means to cultivate and to care for. *Der Bauer* is the dwelling peasant farmer first, and only the builder or carpenter second. Prior to and more fundamental than building as construction is building as cultivation, a sense of building which is a "preserving and nurturing," rather than the making of some thing. Finally, in this primordial sense, building is indicative of what it means to be human.

But what, more fully, does it mean to dwell humanly? It means, suggests Heidegger, to build and rest in the clearing in which the earth below and the sky above are held together, in which the divinities are acknowledged as other than ourselves as mortals. Furthermore, concretely—both in cultivation and construction—human beings bring to pass such dwelling with the fourfold by building.

In the second section of his essay, Heidegger thus turns to building. Using the example of a bridge, he describes or points out how this construction assembles and opens up a space between earth and sky, in relation to both mortals who traverse it and the divinities whose statues adorn it. As at once an opening up and holding together of the fourfold, the bridge is a thing. It is, moreover, things in this rich and primordial sense that constitute place, of which space is an abstraction.

In the epilogue, reflecting on what has transpired in this meditation on dwelling and building, Heidegger affirms as well a primordial sense of *techne* as not constructing but bringing forth. In a translation of Heidegger's words:

> [T]he essence of bringing forth buildings can be thought adequately neither architecture or as engineering construction, nor as a simple combination of the two. [Indeed,] the bringing forth of buildings would fittingly be defined *not even if* we were to think of it in the sense of the original Greek *techné* as *only* a letting-appear.... [Instead,] the essence of building is letting dwell. [And] dwelling... is *the foundation* of Being, according to which mortals are (pp. 34 and 35).

Attempting to say after Heidegger what Heidegger says, perhaps it would not be too far off to note that, as a cultivation, dwelling building is akin to a writing on the earth. Dwellings are to be read, and in the reading we dwell. Precisely what is unsettling about modern technological construction is that, instead of holding together earth and sky, mortals and divinities, it penetrates the earth to extract resources, pushes beyond the sky with rockets and satellites, attempts to suppress mortality with medicine and drugs, and precisely in this attempt to control the body, rejects the art of dying, and thereby and in the very process the remembering of the divinities that is the most intimate part of human suffering.

Human beings cannot live without some building. But philosophically speaking, as Hannah Arendt suggests, perhaps it is in deeds and words that this building takes place as much or even more than with the the hands.

The Vanishing Vernacular
All homes, while they are homes, are vernacular.

The vernacular is that which, according to Ivan Illich, "is homemade, homespun, homegrown, not destined for the marketplace": in it people dwell, not just live or reside. Moreover, dwellings are "never completed before occupancy." Instead, vernacular "building goes on from lifetime to lifetime." One becomes a vernacular builder the same way one becomes a vernacular speaker—by growing up, living, and dwelling in a particular place at a particular time. The vernacular house is human dwelling made visible, enriched with material traces from its lived past.

Such a vernacular house is vanishing, being made increasingly impossible by changes in science and technology—and in their relationships.

First, science has transformed the meaning of matter, and the science of construction has turned building from a historical experience of inter-generational cooperation—learning over time what works, and passing this on by tradition and apprenticeship—into one of thinking through by means of structural formulas. At the same time, the authority of science has been replaced with the celebration of irony. Who cares what science says, we say, even as we appeal to just what science says, except in those margins of commerce where it makes no difference.

Second, technology has expanded the world of artifice to the point that even nature has become an artifact—preserved in museums, protected in national forests and wilderness areas, and managed by global climate treaties. Technology likewise has deepened its penetration into the lifeworld from the first-order technics of the hand-made, through the second-order technics of the machine-made, to the third-order technics of the virtual, each wrapped around and enclosing, while transforming the other. The

lower order technologies of mailbox, clipboard, and rotary telephone are preserved as icons on the screen of the computer.

Third, society—itself a modern construct replacing *polis* and the state—has become a portable stage for enacting the cut-up and folded-in (William Burroughs) media dramas of commerce, politics, and entertainment. No one really lives here. In a world in which the number of motel rooms approaches that of houses, houses themselves become McMansion motels—and citizens become consumers. Anyone who would try to subordinate science or technology to social regulation is dependent on science for standards, on technology for communications, and on society itself flickering alive only in popular approval and market share. There are no more "words from our sponsor" because the sponsor's product is featured in the MTV video of the "green music," if not the movie.

Cut-up and folded-in, science and technology become technoscience. Blended with commerce, politics, and entertainment, technoscience becomes the Mars Rover Website. We live here like we live on Mars: through cameras, recordings, sensors, transmissions, and the screen.

A century or so ago in North America, the vernacular house was turned by advances in transportation and communications into what might be called the standard or "popular" house. First, materials and styles jumped regional borders. What was once native to place became universal construction options: the Cape Cod house, the ranch-style house, etc.

Then the materials themselves began to come in molded, interchangeable panels and disposable modules. The popular "mechanic" or owner-built house, even though handmade, became less and less made by hand—and more and more made according to a packaged pattern with power tools and skills. Amateur builders were further seduced with log-kit and precut houses. The imaginative, trash-based hovels of the Mexican-American *frontera*, even the shacks of the "homeless" in Los Angeles or New York, in many instances are more "housing by people" than the do-it-yourself suburbs of mid-America.

Post-Vernacular Construction

The vernacular house is vanishing. I know this not simply from history, but because I tried to build one—and failed.

My attempt to build a vernacular house began with the purchase of a piece of semiarid land in the western United States, on the eastern slope of the snow-capped Sangre de Christo Mountains. On this land were the ruins of a mining town—Alamo, Colorado—from the 1930s. The remains of Alamo were thirty to forty house foundations, all surrounded by rubble, mostly handmade cement brick. At one side of the town stood three 25-foot-high corners of a once-thriving general store. As if sponsoring reflection, the ruins suggested, "Let us build here again."

Notes on Reconfiguring Alamo images

1

The ultimate design for me is the natural
world with its "ten thousand things,"
its "more than can be imagined" things,
its shifting patterns of order and disorder.

2

The pristine beauty of nature
is something we respond to even as children.
Somehow we want to claim it as ours
so that we can experience it
in the deepest way whenever we want.

3

By the time I could financially claim my own
piece of beautiful land, I no longer wished
to disturb anything remotely pristine.
I wanted to preserve, not disturb;
I wanted to demonstrate respect
and stewardship.

4

Already disturbed land, "ruined" land —
now that was something else.
That was land on which I could practice
the arts of living without causing further harm.

What I wanted was to build on the margin of these ruins, incorporating the foundation of a former store manager's dwelling, scavenging and reusing old brick in ways that would honor both material memories of those families who once lived here and the high mountain desert landscape—the sandstone and broom weed, the piñon pine, the horny toad, field mouse, and rattlesnake, and the coyote, antelope, big horn sheep, and bear. I wanted to camp on the land and learn its contours, gathering materials slowly—thinking, dwelling, and building only as seemed appropriate while I rummaged among the rubble.

But there were forces that made such an approach un-dreamable: the bank and building inspector—and my own impatience, incontinence, and incorporation in artificial lifeways that I could criticize but not escape.

For the bank to provide a construction loan, it is necessary to have a building permit. To get a building permit, it is necessary to have a plan, a design. The house I wanted to build while dwelling and thinking had, instead, to be planned and designed while commuting and calculating. On one visit, I would try to figure out this, on another visit that.

My dream had been of a dialogue with the local landscape and its history. But the bank and the building inspector—and the demands of time and responsibility—required that this dialogue be scripted in advance, if not transformed into a monologue. Everyone had to know what to say. It was technically illegal, I discovered, even to move onto the land without permits and plans. "You have to know what you want to do," I was told—when all I knew was that I wanted to be taught by the rubble below and the open sky above, and the mortals and gods lurking in their midst.

In saying that this attempt to build a vernacular house failed I am, of course, adopting a particular view of the vernacular. The vernacular itself is a contested terrain, with at least three points of leverage on material culture: the vernacular of orality, the vernacular of art and literature, and the vernacular of mathematics. The vernacular of an oral tradition is not open to us. It is only between the vernacular of the alphabet and of numbers that we may choose.

In North America, it is vernacular mathematics that rules. The inspirational literature of, for example, *Architecture without Architects* and *Shelter* provides no practical guidance. Ken Kern's *The Owner-Built Home,* although it attempts to use numbers gently because it addresses do-it-yourselfers from Maine to California who would built everything from one-room houses to two-story barns, has to resort to at least rudimentary formulas and tables. The same goes for every other written effort to communicate the builder's craft. Charts replace apprenticeship.

Kern's five basic principles nevertheless can keep one grounded to some degree:

First, pay as you go—don't get a bank loan.
Second, do your own work.
Third, follow your own best judgment.
Fourth, use local materials whenever possible.
Fifth, design and plan your own home.

If these five principles could be adhered to—supplemented by the assumption that one lives in the house one builds—one would come close to a reconstitution of the vernacular, perhaps even what Gary Snyder calls rehabitation.

The real stumbling blocks, of course, are principles one and five. Who can build without some help from the bank? And don't the very actions of planning and designing necessarily detach one from the building process itself?

Because of an embeddedness within technoscientific culture and family responsibilities that could not be set aside or sublimated to new orders, I gave in on the first principle right from the start. I went to the bank and applied for a construction loan. This at least allowed me to live on the site for much of the time I was building. I could afford to camp there on the verge of illegality—pseudo-dwelling and weak thinking, day in and day out for a long summer of owner building.

But the bank loan also forced me to do design work, which I struggled with, learned from—and sometimes failed at. Building codes forced me to do things I didn't want to do. And more than once I did not pass code-driven inspections, and had to do things over again.

At the same time, there is much to be said for building codes and construction standards. Technical standards are an unheralded way to exercise social control over technology. The problem is that these same standards too often mirror technical ideals and practices. They echo and reinforce the self-serving demands of materials fabricators, the construction practices of corporate contractors, and the risk calculations of insurance companies. Is there a way around such technical prejudices? Could there be alternative standards?

Some of my failures actually turned out to be the best parts because, as a result, walls had to be constructed in unplanned places and therefore grew up, vernacular-like, in the middle of the building, construction dwelling on the site, and thinking. But they were costly, too. Consider only the plumbing and wiring. Because I had to hire a licensed plumber and a licensed electrician—because this is what the plumbing inspection and the electrical inspections required—I had to tell these professionals what to do: with drawings, with plans, and with designs. It had to be thought out beforehand, for another's hand.

When I didn't get this right before the other's hand and tools went to work, the result was that plumbing or wiring had to be moved or redone. So I had to pay twice for one piece of work. It
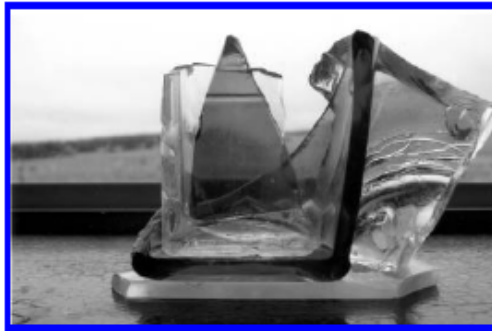
Sculptures made from found material,
some natural, some fabricated,
on the land at Alamo.

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cost more to be vernacular. "Don't you know what you want?" the plumber asked me once.

No, I don't know what I want—until it happens. Vernacular architecture is a like action painting. One has to try out many alternatives before getting a good fit. If that trying out is projected on, and limited to, the drafting table—even more to the computer screen—I lose the hand-with-its-hammer, my body, in the building. My body, instead, becomes a tool of the plan, the design. "Take the measurement from here, just like it specifies in the plan. Put the wall there, just like it says. Can't you follow directions?"

In the vernacular world, directions are inherently unclear. Technoscience and engineering aspire to make it all clear—which also clears out the vernacular.

To resist the virtual life of design is possible—but only as a rearguard action. The avant-garde reactionaries of Jesse Tatum's home power movement are a perfect example. They do not lead to the vernacular house so much as to the minimally connected habitat and home, imperfectly reflecting unrealized dreams. Yet is it not the case that all homes, as they become transformed by do-it-yourself projects, over time, partake more and more of dreams—and of the vernacular?

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Before the New Bauhaus: From Industrial Drawing to Art and Design Education in Chicago
Barbara Jaffee

In his recent book, *Art Subjects: Making Artists in the American University,* Howard Singerman describes as ironic the fact that when the design curriculum developed at the German Bauhaus in the 1920s was assimilated in the United States some fifteen years later it was as instruction in "fine arts."[1] The irony, however, is both less and more than Singerman's observation allows. Less, I will argue, because distinctions between what counted as instruction in design, or industrial arts, and instruction in fine arts in the United States never have been clear-cut. But also more, because it is exactly the kind of statement that makes it difficult for us to reconstruct the tangled trajectories of art and design education in the United States. For much of the twentieth century, the arts were made to simultaneously serve a variety of purposes (and political positions) in American education—at once vocational training *and* a source of spiritual uplift; the basis of progressive educational reform *and* a vehicle for social control. This is because two powerful cultural tendencies converged in the United States during the last decades of the nineteenth century: the pragmatic interdependence of art and industry established in the immediate aftermath of the Civil War (as business leaders advocated mass instruction in art as a way of enhancing the country's competitiveness in emerging world markets), and the utopian focus on art as an arena of social improvement (as conservatives and progressive reformers alike reacted to the excesses of capitalist competition). Modern American art instruction emerged out of these contradictions, as links between the acquisition of manual or industrial skills and the development of the intellectual or moral faculties were forged in public understanding.

Nowhere are these complications closer to the surface than in the history of art and design education in Chicago. Long before it became famous for the renewal and transformation of the Bauhaus idiom in its architecture and design of the 1940s and 1950s, there was the precedent set in Chicago by the discreet departure of many painters and sculptors even as architects and engineers were descending upon the city following the Great Fire in 1871. Chicago was home to a huge printing industry and turbulent labor politics in the late nineteenth century—two features key to its development as a center for art instruction. Not only did the burgeoning print culture of the late-nineteenth century require skilled renderers (in the age before
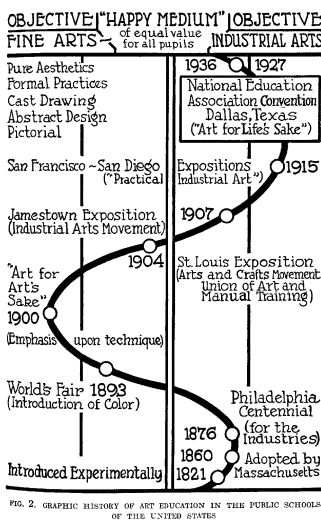
OBJECTIVE "HAPPY MEDIUM" OBJECTIVE
FINE ARTS of equal value INDUSTRIAL ARTS
for all pupils

Pure Aesthetics
Formal Practices   1936 ○—○ 1927
Cast Drawing   National Education
Abstract Design   Association Convention
Pictorial   Dallas, Texas
                          ("Art for Life's Sake")

San Francisco ~ San Diego   Expositions ○ 1915
("Practical)   Industrial Art")

Jamestown Exposition   1907 ○
(Industrial Arts Movement)
                  1904 ○ St. Louis Exposition
"Art for   (Arts and Crafts Movement
Art's   Union of Art and
Sake"   Manual Training)
1900
(Emphasis upon technique)

World's Fair 1893   Philadelphia
(Introduction of Color)   Centennial
                           (for the
                   1876 ○ Industries)
                   1860   ○ Adopted by
Introduced Experimentally 1821 ○ Massachusetts

FIG. 2. GRAPHIC HISTORY OF ART EDUCATION IN THE PUBLIC SCHOOLS
OF THE UNITED STATES

Figure 1
William G. Whitford, "Graphic History of Art
Education in the Public Schools of the United
States," *An Introduction to Art Education,*
1929.

photo-mechanical reproduction), but also, as Ellen Mazur Thomson has demonstrated, the profession of graphic designer developed in America alongside the industrialization of printing.[2] At the same time, civic leaders were responding to the tensions produced by Chicago's growing immigrant population with an aestheticism promoted by humble settlement houses and high-minded institutions of fine arts alike.[3] In this context, two cultural institutions today unequivocally associated with "fine arts" idealism, the Art Institute of Chicago and the University of Chicago, were in fact early pioneers in industrial arts education—training that was responsive to the needs of industry and delivered, in the case of University of Chicago, within the context of a general, or liberal, arts education.

There is no irony here, however. The needs of industry, real or imagined, always played the lead role in American art pedagogy, as a close look at the chart prepared in 1929 by University of Chicago art educator William Whitford suggests. (fig. 1) Although traced in a line William Hogarth would have loved (and which distorts somewhat its legibility), Whitford's graphic history of art education in American public schools (part of a text Whitford prepared as a general introduction to the field) allots but a scant eleven out of the 108 years between 1821 and 1929 to the pursuit of fine arts objectives.[4] Even the years 1893–1904 (between, in other words, the World's Columbian Exposition held in Chicago and the St. Louis Exposition) may be understood as having a strong industrial inflection. As I demonstrate below, a relentless drive towards standardization of methods (based, like American techniques of mass production, on a belief in the interchangeability of art's parts), resulted in highly technical systems of teaching that made the so-called principles of design, or composition, fundamental. This notion, that teaching composition was essential for an integrated education in fine and industrial arts, helped to shape the development of two venerable Chicago schools as they transformed themselves from bastions of Arts and Crafts-inspired progressivism in the 1890s into laboratories for efficient education by the 1920s. Two figures virtually unknown today emerged as central to this process: George Eggers, Director of the Art Institute 1916–1921, and Walter Sargent, professor of art at the University of Chicago from 1909 to his death in 1927. In this article, I trace the trajectory of integrated arts education in Chicago, and briefly consider its impact on the well-known survey text, *Gardner's Art Through the Ages* (written in the 1920s by a graduate of the University of Chicago, and based on a course offered to students at the School of the Art Institute). In conclusion, I look at the circumstances under which industrial and fine arts education ceased, for all practical purposes, to be an integrated pursuit.

CARD-EXERCISE VI.

HORIZONTAL REPETITION.

Guilloche. Leaves and Berries, Conventionalized.
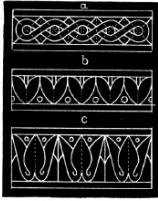
FORM *a.* — Draw five squares, touching one another horizontally. Fill them with an endless band, as *a*, in the last card-exercise, was filled. Add the parallel side-lines.

FORM *b.* — Draw five squares, touching each other horizontally. Fill them with repeated leaves like those in *b*, last card-exercise. Add the parallel side-lines.

FORM *c.* — Draw three squares, touching horizontally. Add their vertical diameters, as construction lines, and then fill the squares with repeated flowers, as shown in the copy.

CARD-EXERCISE VII.

Simple and Compound Abstract Curves, Balanced.
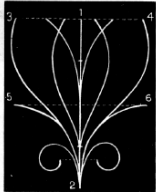
The curves 3 2, and 4 2, those which end nearest 1, and the spirals at the bottom, are all compound. The other two pairs are simple curves. Remember this when drawing the curves.

Draw 1 2, and divide it into four equal parts. Make 3 4, 5 6, equal to three-fourths of 1 2. Draw, first, the longest curves 3 2, 4 2, balancing them

equally on each side of the vertical line. Draw the simple curves springing from 5 and 6 to join the curves first drawn. Divide 1 3 into four equal parts, also 1 4. From the central points of division, draw the simple curves to the centre of the vertical line; and, from the points of division nearest 1, draw the tulip-shaped curves terminating at the lowest point of division on the vertical line. Draw the spirals, with their ends joining the ends of a horizontal line drawn two-thirds of one part of the vertical line above 2. See that all the lines run gracefully into one another.

CARD-EXERCISE VIII.

Simple and Compound Abstract Curves, Balanced.

It will be seen that this is a slight variation of the last exercise, the spirals being drawn near the centre of the vertical line, and the long compound curves, terminating near 1, being drawn from the bottom of the vertical line. Draw, first, the lines on the left, and then those on the right to balance.
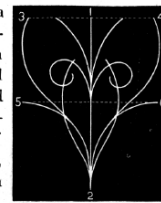
THE SPIRAL.

There are two varieties of the compound curve called the spiral. In the first variety, the distance between the different spires is the same, as shown at I. This is called the equable spiral, because its

11*

Figure 2

Walter Smith, *Teachers Manual for Freehand and Intermediate Drawing*, 1887.

Out of the Ashes

Founded as the Chicago Academy of Fine Arts in 1878 out of the ashes of an older, artist-run organization, the Art Institute of Chicago [AIC] and its School (the name was changed in 1882) was the project of a group of businessmen convinced that arts education was vital to the commercial success of their city. They were not alone in this conviction. In response to concern over the reception of their applied arts at the Great Exhibition of 1851, the British had established the schools and museums known as South Kensington (the nucleus of today's Victoria and Albert Museum).[5] In Massachusetts, the Free Instruction in Drawing Act of 1870 provided a mandate for instruction in industrial or mechanical drawing for any citizen of that state over fifteen years of age. It also established compulsory public school drawing education in the South Kensington style—the flattening of natural forms based on geometric convention (fig. 2) (the state engaged Walter Smith, a graduate of South Kensington National Art Training School and former art master in charge of the branch school at Leeds)—satisfying the desire of prominent local industrialists to provide drawing education for industry by exploiting popular and patriotic belief in drawing's less tangible qualities: that its practice cultivated habits of neatness and accuracy, taste, imagination, and the powers of invention.[6] The new School of the Art Institute of Chicago [SAIC] was equally eclectic, emphasizing the traditionally fine arts offerings of its predecessor (figure drawing, anatomy, etc.)
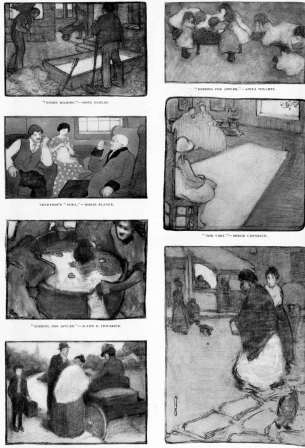
while adding a vigorous technical component: Saturday and evening classes in ornamental design, woodcarving, frescoing, mosaic, and stained glass attended throughout the 1880s mainly by men engaged in decorative arts and design and in Chicago's vast commercial lithography industry. Yet the division of the School into elite academy by day and working-class applied arts school by night (and weekend) failed to satisfy for long. Following the embarrassment suffered by the United States over the poor reception of its applied arts at the Paris Exposition of 1889, educational leaders in Chicago and elsewhere began to advocate the "industrial value" of traditional aesthetics.[7] At SAIC, applied arts courses would be fully integrated with the academic day program by 1897, the year that programs in what were described as the "modern arts" of illustration and advertising were introduced as well.[8]

SAIC's first instructor of illustration and advertising was Frederick Richardson, an artist trained at the St. Louis School of Art and in Paris, and an illustrator with the Chicago *Daily News.* Richardson introduced classes in composition, using systematic methods such as memory sketching in which students were asked to challenge their powers of retention by rendering objects without recourse to direct observation. (fig. 3) A particularly dry form of memory sketching, in which mechanical drawings of architectural details and ornamental combinations served as models, long had been part of the practical, South Kensington-based drawing courses taught in British elementary schools. But Richardson was an advocate of the more recent French deployment of memory sketching—a technique intended to foster originality in students' work by encouraging them to distill the essence of their perceptions.[9] Equally modern was his treatment of the "inspired" art of composition as an educable skill. In sharp divergence from the European academic tradition, many American educators believed that abstract laws or principles of art existed which, once stabilized, would not only facilitate the production of art, but raise it to a higher level.[10] Educators and policymakers agreed by the turn-of-the-twentieth century that an education in the principles of design would enhance a young student's appreciation of and, ultimately, ability to produce objects of beauty; the turn to teaching composition was attractive as well to art schools, including SAIC, forced to respond to complaints that their teaching was impractical. [11]

Richardson's better known contemporaries, Arthur Wesley Dow at Pratt Institute (and later Columbia University) and Denman Waldo Ross at Harvard, devised elaborate systems for teaching composition, using diagrammatic exemplars and recipes. Dow, for example, offered practical suggestions based on analyses of Japanese design, and insisted that his study of design would level traditional hierarchies: "Composition," he wrote, "is made the basis of all work in drawing, painting, designing, and modeling—of house decoration and industrial arts—of normal courses and of art training for chil-
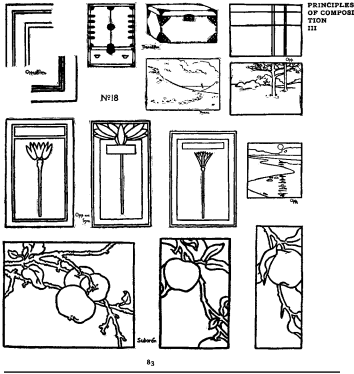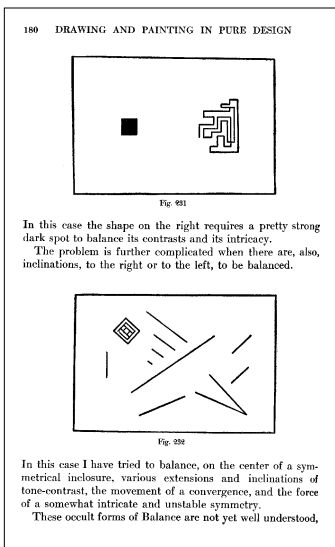
Figure 4 (above)
Arthur Wesley Dow, *Composition,* 1920.
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University of California Press.

Figure 5 (below)
Denman Ross, *A Theory of Pure Design,* 1907.

dren." [12] Through a series of graduated exercises, Dow encouraged students to explore what he called a picture's "line idea"—an intuitive division of the picture plane which was to precede and make possible the subject of representation. "A picture," Dow wrote, "may be said to be in its actuality a pattern of lines. Could the art student have this fact in view at the outset, it would save him much time and anxiety. Nature will not teach him composition." (fig. 4) Dow's synthetic pedagogy emphasized originality and personal choice; it received wide public circulation following the 1899 publication of his textbook *Composition.* Ross's 1907 *A Theory of Pure Design* was, by comparison, a densely mathematical treatise of neo-Platonic precision and mystification. [13] Under Ross's system, it was not intuition but nature's "geometric essence," distilled through scrupulously objective observation, that was to be the true source of all knowledge of design. (fig. 5) In representation, Ross advised, the artist must begin with an idea, the substance of which is science (inspired by observation and modified or verified from nature), the form of which is art. Ross, whose lectures on the theory of design at Harvard captured the attention of a generation of future architects, museum administrators, and art historians in the opening decades of the twentieth century (Roger Fry among them), emphasized studying the past and applying principles derived from such study to present art. His was an attempt to develop a rational, scientific theory: a major preoccupation in Ross's work, for example, was the elaboration of the aesthetics of perception, and the analysis of the interaction of colors. [14]

At SAIC, Richardson's passion for modern methods made him an ardent admirer of avant-garde French painting—Georges Seurat in particular—and he encouraged the same in his students. With the hiring of Richardson, a rift opened between the genteel past of SAIC's day program and the imperatives of a more competitive present. Traditionalists at the School tried to reorganize its program along the lines of the French atelier system in 1903. Yet academic life and antique drawing classes remained restricted to mornings only. Afternoons continued to feature a more progressive fare, including still-life painting, courses which concentrated on drawing geometric forms from solid blocks, composition, illustration, and figure classes for beginners which emphasized sketching and memory practice. Around this core were grouped special departments of decorative designing, normal instruction (teacher training), architecture (taught in tandem with the Armour [later Illinois] Institute of Technology), and evening classes which extended these offerings to part-time and working students. [15] By the fall of 1906, this rupture had been codified in the school's catalogue. That year, SAIC's statement of purpose and description was modified by a division of the faculty into categories designated "eminent and experienced" on the one hand, and representative of "the younger element" on the other (the latter group, significantly, comprised of colleagues in the school's department of illustration—former students of Richardson's who

had studied at SAIC in the late 1890s and early 1900s).[16] SAIC had, in fact, so enthusiastically embraced the latest trends in pedagogy that, upon the death of its renowned figure drawing instructor John Vanderpoel in 1911, Art Institute director William M. R. French was moved to observe that, in line with the trend of the time, the School had become a "modern school of color and composition." [17]

A Modern School

If the proposition that SAIC was a modern school in 1911 strikes today's reader as unlikely at best, it is due largely to anecdotes such as Georgia O'Keeffe's of her disastrous semester as a student of Vanderpoel's "severe art" of figure drawing in 1905, or the many horror stories of Chicago reactions to the Armory Show in 1913. Regarding the latter, it is important to note that the fact that the Armory Show was at AIC at all is telling—after all, the Metropolitan Museum in New York refused it.[18] The case of Vanderpoel and O'Keeffe bears closer scrutiny as well. Despite his reputation as a traditionalist, popular society painter John Vanderpoel's teachings once were recognized as quite innovative. In common with his contemporary Thomas Eakins (who also taught art via the figure exclusively, proclaiming that an education in "pure art" served every student, fine, industrial, and amateur alike), Vanderpoel used principles that have their origin in American craft traditions of pattern and piecework. Both emphasized the geometric construction, weight, and volume of the human figure, with Vanderpoel guiding his students carefully through the principles of figure construction in a series of lectures accompanied by large demonstration drawings.[19] One might as easily say that O'Keeffe, who was converted to a progressive ideal as a student of Arthur Dow follower Alon Bement at the University of Virginia in 1912, narrowly missed becoming a modernist at SAIC: Dow's pedagogy attracted a large following in Chicago after 1900 (he gave a series of lectures in Chicago that year), and his methods were standard practice in the School's normal (teacher training) department by the time O'Keeffe arrived.[20] O'Keeffe's contemporary, Thomas Hart Benton, attended SAIC at practically the same time and acquired there the lifelong interest in abstract patterning that he called his "modern inheritance." [21] Benton's own pedagogy focused on composition as well. His optimistically-entitled essays "The Mechanics of Form Organization" c. 1926–1927, for example, featured a number of schematic illustrations intended to demonstrate "fundamental mechanical" design principles.[22] (fig. 6)

The distance is great, however, between director French's essentially romantic notion of what it meant to be a modern school and the more mechanistic vision about to emerge at SAIC. When French himself died in June 1914, just months before the outbreak of World War I, the coincidence of the two events suggested a motive—and presented an opportunity—to the small but influential faction of original members remaining on the Art Institute's board of
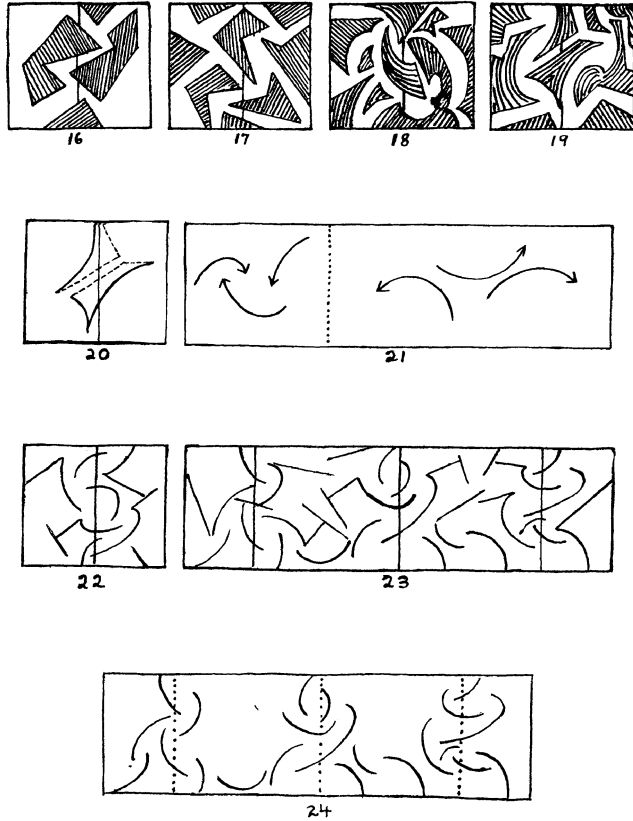
trustees. Newton Carpenter, AIC's secretary since 1881 (and before
that instructor of perspective in its school of art), assumed the posi-
tion of *director pro tem.* He and Charles Hutchinson, president of
the board since 1882, shared a vision of the synthesis of art and
industry that had taken on renewed urgency with the First World
War. Each recently had discussed the changing role of the museum
in the *American Magazine of Art,* (formerly *Art and Progress,* it was
the organ of the American Federation of Arts, a progressive group
co-founded by Hutchinson in 1909).[23] Carpenter immediately made
clear his intention to increase the Institute's popular appeal: "The
opportunities for greater usefulness were never so apparent as at the
present time," he wrote in his annual report of 1915.[24] But he was, at
least initially, unable to put his reforms into practice in SAIC's curric-
ulum. Although he convened a new committee on the School—and
charged it with the responsibility for updating its course of stud-
ies—the conservative committee members refused to act.[25]

Undaunted, Carpenter and Hutchinson focused on hiring
a passionate educator—and ally—for AIC's vacant directorship.
Although the board deferred consideration of the subject at its
January 1916 meeting, by February two candidates, George Eggers
and James P. Haney, had emerged. Both were progressive educa-
tors. Eggers, who had studied with Arthur Dow at Pratt, had been
head of the art department at the Chicago Normal School since 1906

tom of the enclosing rectangle, which proportion the details of the foot and the lip, do not need explanation, beyond mention that AB is a square in the center of CD, this area being a whirling square rectangle.

The red-figured lekythos, G. R. 189, Metropolitan Museum, New York, Fig. 16, supplies the ratio 1.528 (compare Amphora, Fig. 1, page 91, Chapter VIII). This form may be subdivided into two 1.309 shapes, 1.528 divided by two
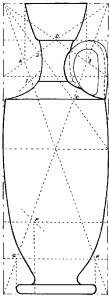
Fig. 14. Lekythos G. R. 540, Metropolitan Museum, New York.
(Measured and drawn by the Museum Staff.)

Figure 7
Jay Hambidge, *Dynamic Symmetry: The Greek Vase,* 1920.

and was vice-president of two of Chicago's best-known progressive groups—School Arts and the local Arts and Crafts Society.[26] Haney was director of art and manual training in the public schools of the city of New York, and formerly a lecturer in New York University's School of Pedagogy. Again, the board balked, recommending in May only that Eggers be appointed to a newly created office of assistant director. Nevertheless, on August 9, 1916, George William Eggers was elected acting director of the Art Institute of Chicago and its School. A new office, that of Business Manager, was created at the same time, and Newton Carpenter elected to that position. On July 18, 1917, Eggers was elected unanimously to the office of director. He assumed his duties on the first of September.[27]

This unprecedented appointment opened the door for some dramatic changes. Eggers came in with what must have seemed to him to be a mandate to reorganize SAIC. He immediately added two classes—elementary decorative design and elementary picture design—to the courses required of first-year students in the School's core academic program. In fact, teaching composition was crucial at Eggers's SAIC. He made the School an early center for the "scientific" pedagogy that dominated the patriotic second wave of industrial arts education—including a drive to reform the tastes of working-class families—formed in the wake of the First World War: illustrator Jay Hambidge's Dynamic Symmetry.[28] A compositional system based on the mathematical theory of proportion known variously as the logarithmic spiral, the golden section, or the Fibonacci series, the "laws" governing dynamic symmetry's infinitely flexible sequence of diagonals or so-called "whirling triangles," according to Hambidge, had been distilled by the ancient Egyptians and Greeks from their observations of the organic growth of shells and the sequence of leaf distribution in plants, and were the basis of all design in Greek and Egyptian art and architecture (fig. 7).[29] This is not to say that change was accomplished without resistance. Eggers had hoped—but was unable to convince members of the School Committee in 1916—to add four courses, not two, and to hire as their instructor Emma Church of the more vocationally-oriented Chicago School of Normal and Applied Art [CSNAA]. But by May 1918, the makeup of the school committee included several of the more forward-thinking members of AIC's board—Arthur Aldis, Howard Shaw, and Abram Poole—some of whom had been involved with bringing the Armory Show to Chicago in 1913, and all of whom had tried to organize a show of modern German design before the outbreak of war. This progressive faction had managed to reinstate earlier, stalled negotiations between SAIC and Church based on Church's proposal to merge her industrial arts school with SAIC, with herself as its director.[30]

At an emergency meeting of the reconfigured school committee held December 7, 1917, it was announced that Aldis and Shaw would be visiting Church's Chicago School of Normal and Applied

Art immediately. Emma Church, in attendance at the next committee meeting (February 9, 1918), underscored the urgency of her proposal by noting that there were at least two other movements afoot for industrial schools of art in Chicago.[31] Asked by committee members to compare Church's methods to those in place at SAIC, Eggers commented that "the methods of instruction in the academic type of art school, under which head the Art Institute may be classified, as well as certain other important schools in the country, had remained insensible to the development of the science of education which has largely taken place during the past twenty-five years." When Church left the meeting before its adjournment, however, Eggers added that "the observations that she made with regard to the Art Institute school also were observations which had manifested themselves to him, but that he had been advised to give his first attention to the work of the museum during the period in which he was being initiated into the problems of the Art Institute, and therefore had recommended no course of action, though he had spent much time in the school, and formulated his observations in a statement for future presentation." On April 25, 1918, two proposals from Church for merging SAIC and CSNAA were submitted in writing to the School Committee. Eggers submitted his own plan for reorganizing SAIC on April 26th. On April 29th, the board voted to reject Church's proposal. One week later they resolved unanimously to accept Eggers's alternative.[32]

Eggers's pedagogical vision emerged in full force in SAIC's catalogue for 1918–1919, which shows that the new program was based on a division of three parts: an introductory program called the Lower School, which offered basic courses in drawing and design (including color) to all untrained students; a Middle School in which design, normal and commercial art, illustration, and crafts were pursued side-by-side with elementary painting and sculpture; and an Upper School, in which advanced students pursued painting and sculpture in an Atelier system with recognized masters. "This reorganization," Eggers wrote, "recognizes not only the responsibility which the art school owes to American industry, but takes full cognizance of the responsibility of the school to the individual whose vocation must render him a livelihood." [33] The centerpiece of his new plan was the reorganized design department, for which Eggers was able to recruit as head the distinguished modern designer Hermann Rosse, a native of the Netherlands. Emile Rollet of Paris, chief designer for the Star-Peerless Wallpaper Mills, came as visiting instructor of wall coverings and textiles. Finally, Richard Fayerweather Babcock, a renowned poster designer and producer of war posters for the Navy Department, was invited to teach a course in his field. The Scammon Lectures for May 1919, AIC's prestigious series of annual public lectures, were delivered by James Haney, director of art in high schools for the city of New York and an impassioned author of various calls for increased industrial arts education

following World War I (the same Haney AIC had refused for the position of director three years before). His topic was "Art for Use."[34] That spring, Eggers invited a group of local manufacturers, designers, and educators to AIC to meet and talk with Florence Levy of the New York-based Art Alliance of America (publishers of *American Art Annual*). As a result of this meeting, a permanent organization, the Alliance of Art and Industry, was set up in Chicago in September 1919. Reorganized as the American Arts and Industries Society in August 1921, this group was the precursor to the Association of Arts and Industries—best known for bringing László Moholy-Nagy and the New Bauhaus to Chicago in 1937.[35]

The Early History of the University of Chicago
The ideals of progressivism neatly dovetailed with the needs of industry in the early history of the University of Chicago as well. AIC trustees Charles Hutchinson and Martin Ryerson formed the core of the board when the new university opened its doors in 1892 as a modern, comprehensive university with graduate programs, laboratories, seminars, and specialized lectures derived from German models. The reform-minded charge of its first president, William Rainey Harper, to focus on the relationship between industrialism and democracy in the urban setting, attracted a number of faculty interested in the sociological dimension of art and aesthetics.[36] Although the University at first offered neither practical courses in art nor courses in art history, it did make manual training, along with cooking and sewing, the basis of regular instruction for very young children at the experimental school opened by the young John Dewey, professor and head of philosophy and pedagogy in 1895. Dewey's progressive Laboratory School joined forces with the vocationally-oriented Chicago Manual Arts Training School (founded in 1884 by the Commercial Club of Chicago, a business organization whose membership included many of the same individuals involved with both the Art Institute and the University of Chicago) in 1901, under the auspices of the University's new School of Education. When the School of Education became a center for the empirical "science" of education with the arrival of its new head, psychologist Charles Hubbard Judd, in 1909, the stage was set for industrial drawing to emerge as an important practice.

Walter Sargent, director of drawing and manual training for the City of Boston and, before that, Massachusetts state supervisor of drawing, came to Chicago as professor of manual training and art in relation to education the same year as Judd. Sargent had worked closely in Massachusetts with Henry Turner Bailey, the man who gave shape to the optimistic social and psychological goals of the Massachusetts Drawing Act by emphasizing the "industrial" value of nature drawing, drawing from the human figure, and portrait painting (in fact, the two were brothers-in-law).[37] Bailey and Sargent were graduates of the Massachusetts Normal Art School established

Figure 8

Page from Henry Turner Bailey's report, *Sixty-First Annual Report of the Board of Education of the State of Massachusetts... 1896–1897*, 1898.
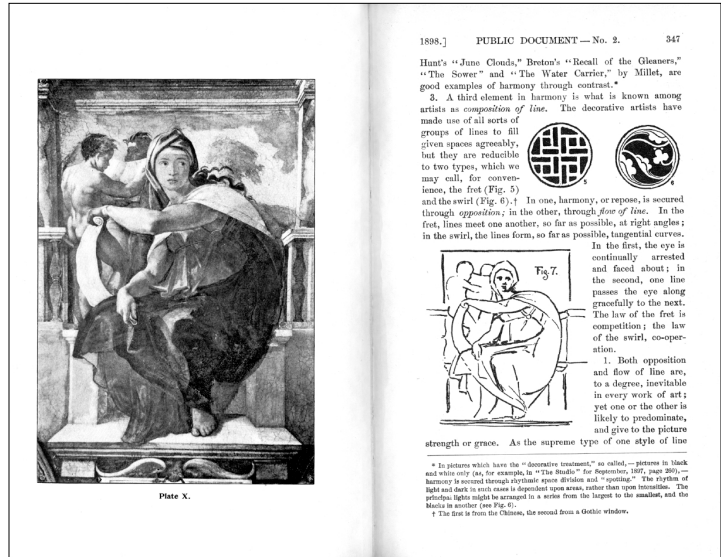
by Walter Smith in 1873 (today's Massachusetts College of Art, this school produced a generation of art educators formed in Smith's image), but rejected the vocational approach of South Kensington after 1889. Their new commitment was to exercises they described as more "developmentally appropriate" for young children, such as sketching from objects in order to immerse the child in a more potent aesthetic experience and to nurture his individuality.[38] They advocated the new picture study as well, along with diagrams explaining composition and suggesting questions to be used by teachers to guide children's explorations of subject and meaning. (fig. 8) The two studied color and composition with Denman Ross at Harvard in 1901, and found in his teachings an especially efficient system for the production of beauty—a democratic system that could, despite its complexity, be implemented by all who chose to follow its precepts closely.

Sargent applied Ross's theories to his principal responsibility at Chicago: formulating a single course of study that would serve both the fine and industrial arts.[39] Composition, he concluded, was the common denominator. Following the 1912 publication of the results of his work as *Fine and Industrial Arts in Elementary Schools* (a book intended to set national standards), Sargent's practical courses in color and composition began to be cross-listed between Chicago's School of Education and its art history department. The art program at Chicago before Sargent's intervention was unremarkable. Specialized art history seminars had been introduced in 1902, taught by faculty whose primary appointments were in disciplines such as archeology and the Semitic languages and literature. Offerings also included, as was typical at the time, courses in "modern" (i.e., Renaissance and after) and American art taught by an artist, George B. Zug, a graduate of the university. Beginning in 1915, however, the University made a commitment to the emerging academic discipline

of art history when it hired the young Richard Offner, a specialist in Florentine painting, to teach its modern sequence. Steeped in the Germanic tradition of psychological aesthetics and formalism, Offner, like Sargent, explored works of art in light of principles understood to govern the artistic enterprise as a whole.[40] With his reconfigured appointment, Sargent's title changed as well to Professor of Fine and Industrial Art in Relation to Education.

Like his colleagues at the Art Institute, Sargent saw the First World War as an opportunity. In a survey of the state-of-art education for the federal government's biennial study in 1918, he observed that:

> Art education related to industries has been prominent in America for many years. It is receiving fresh impetus at present from the prospect that, after the war, the United States will have to depend upon its own resources more than in the past, not only for designers but also for styles of design. A kind of originality must be developed that can produce things which are not only new but fine in quality.[41]

Sargent's expertise in the industrial arts and scientific teaching methods would have brought him, inevitably, to the attention of SAIC. Sure enough, his name appears among the members of AIC's school committee in 1921–1922, and Sargent was invited to teach an educational psychology course in SAIC's normal department that same year. But his ideas were really put to the test in 1924, when he was named professor and chair of the University of Chicago's reformed and renamed Department of Art. Implicit in the name Sargent gave his new department, which brought together the former department of art education in the School of Education and the department of art history in the School of Arts, Literature, and Science, was his belief that the values and order of art were independent of, and separate from, any particular instance. Eschewing plans to develop an academic department along the lines of Princeton, Sargent instead insisted on the integration of art disciplines and stressed connections between art of the past and the present—what he described as the ways in which art "entered into the current of contemporary life."[42]

Sargent had, in his own words,

> four main objectives in his program: to offer all students an opportunity to develop an intelligent enjoyment of the world's artistic inheritance; to reach a much wider sphere by training teachers in the history, theory, and practice of the arts who will be able to present art in such a way that it will enter into the daily life of students; to offer some experience with the materials of art; and to forward appreciation

of industrial art and to cooperate with the rapidly growing interest in giving to possessions and surroundings greater charm and distinction.[43]

As chair of a department in which history, theory, and practice commingled, Sargent presided in the three years before his death in 1927 over a program that reflected the most progressive factions of modernism in Chicago—a remarkably diverse collection of designers, artists, and art historians. Under his leadership, registrations in art courses reached the unprecedented number of 910 during the academic year 1926–1927. Sargent even had plans for an "Institute of Fine Arts" at the University. In a memorial to Sargent, published in the November, 1927 number of the *University of Chicago Magazine,* sculptor Lorado Taft described an address on the topic before several hundred members of the President's Club as his friend's moment of glory. But plans for an Institute foundered without Sargent's leadership.[44] In any event, under the influence of new president Robert Maynard Hutchins's neo-Aristotelian revolution in the 1930s (Hutchins advocated an emphasis on general courses in undergraduate education in response to what he described as the "sickness" of modern culture), the university's direction would shift dramatically within a few short years away from the far horizon of scientific empiricism.

No Bauhaus
The SAIC already had proved itself to be no Bauhaus. According to AIC's annual report of 1920:

> The school is developing as rapidly as possible toward a closer contact with the industries. The design department has projected a series of courses in typography which are to be put before a number of representatives of the printing industry early in the year for criticism; classes in lithography working under co-operation of the lithographic trade and the Institute are at work in the day, evening and Saturday schools. Other industrial arts courses are contemplated.[45]

But the transformation of the school's curriculum meant high enrollment and prosperity by mid-decade (whereas AIC's annual report for 1917 had noted the School's increased expenses and decreased revenues, enrollment stood at a high of 4,267 following the war), and, as Charlotte Moser has noted, this shift:

> Turned the School into a major source of revenue for the museum at a time when its curatorial program was rapidly expanding. During these years, School surplus often went toward paying museum expenses rather than going back into the School program; more than half of the School surplus in 1924, for instance, was used to pay off the muse-

um's deficit that had been accumulating since the 1880s. That same year, the museum began charging the School rent for its space at a rate of thirty cents per square foot.[46]

This was not the vision of George Eggers. The death of Newton Carpenter in May 1918 had marked a waning of the new director's support. In a break with tradition, Eggers was not called upon to make a report in AIC's annual for 1918 (for the first time in the institution's history, the trustees made their own report instead), and the board brought in one of their own, Robert B. Harshe—a graduate of SAIC, former assistant chief of the Pan-Pacific Exposition (held in San Francisco in 1915), and assistant director of the department of fine arts at Carnegie Institute in Pittsburgh—the following year. Made assistant director "with immediate charge of the School," Harshe became AIC associate director on April 14, 1921.[47]

The AIC's annual report of 1921 tells the tale of what happened next:

> George William Eggers resigned as Director of The Art Institute October 1, 1921, after an association of five years which has been both stimulating and constructive, to assume the task of developing a large museum in Denver. Mr. Eggers will find in his new field opportunity and time to develop his creative side. Robert B. Harshe, a man of wide experience and a trained museum executive, until then Associate Director, was appointed by the Trustees Director of The Art Institute. A careful reorganization of the museum, made necessary by its rapid growth, is in progress.[48]

Eggers' replacement spelled the beginning of the end of the coalition of art and industry at SAIC. Although not averse, in the beginning, to staying the course begun by Eggers, Harshe lost his enthusiasm for the extremes of "scientific" pedagogy after the death of AIC board president Charles Hutchinson in 1924. Harshe had brought in Raymond Ensign, director of applied arts at the Cleveland Museum of Art, as SAIC Dean in 1921 (according to Ensign, the mission of the school was "to pull the conception of the fine arts and the commercial arts together").[49] An innovative new class entitled "Research in Nature" (which mounted sketching expeditions to the Field Museum of Natural History justified in practical terms—as scientific research) was added in 1923–24. The Department of Printing Arts, established by Eggers in 1920 under the supervision of Ernst Detterer, expanded in 1928 to become the Division of Printing Arts and Advertising Design.[50] But Harshe's growing ambivalence eventually would lead to a break with the Association of Arts and Industries. Although he managed to prolong the Institute's relationship with this group—the successor to Eggers's Alliance of Art and Industry—until 1935, the

resignations of Dean Ensign and design department head Alphonso Iannelli in 1929 effectively ended its productive life.[51]

An Unlikely Vehicle

Still, the old ideal of an integrated education in industrial and fine arts lingered for some years in Chicago through an unlikely vehicle: the teaching of art history.[52] One of George Eggers's final innovations at SAIC—following the advice of designer Ernest Batchelder (a graduate of the same summer course with Denman Ross that Henry Turner Bailey and Walter Sargent took at Harvard in 1901)—had been to add art history to the curriculum in 1920. As early as 1910, Batchelder had called for artists to study history, geography, archeology, and ethnology, stressing the streamlined efficiency of earlier epochs in choosing the "line of least resistance in the development of art forms."[53] Art history, then, entered SAIC as part of Eggers's efforts to rationalize its curriculum, and its presence was intended to supply the underlying principles for what had become a highly fragmented pursuit. University of Chicago-trained Helen Gardner offered the first art history survey at SAIC, and based her classic text, *Art Through the Ages,* on that course. By 1926, the year Gardner's book appeared, art history was described in the School's catalogue in unabashedly compensatory terms, as "an intensive study of certain phases of art so presented as to be of particular value to students as their training becomes more specialized."[54] In machine age vernacular, *Art Through the Ages* represented the singular and authoritative position from which the automated assembly line of modernized art education acquired its meaning.

For Gardner, who had studied with both Offner and Sargent at Chicago, it was universal values in design that made it possible for art to have a history, as she wrote in 1926, from the dawn of man, a time in which the fashioning of crude tools was character-

ized by a "feeling for symmetry," to the historical present. Though later formalists would seek to isolate and divide the products of visual culture into decorative *or* expressive, popular *or* avant-garde, and to provide access to them only through cryptic directives and appeals to higher authority, Gardner strove to integrate all the arts in her discussion (including those to which she referred quaintly as "minor"), and to provide clear (i.e., diagrammatic) methods for their appreciation and understanding. (fig. 9) The first two editions of *Art Through the Ages* were admirable though hardly unconventional attempts to survey the world history of art in a single volume for the interested general reader. The compressions and distortions of history necessary to the task produced, in the second edition especially, an outline of world history not unfamiliar to today's reader. But the third, 1948 edition of Gardner's book represented the fullest expression of her integrated fine and industrial arts ideal. It is an extraordinary document, one which echoes in its wildly original periodizations the rhetoric of liberal internationalism in the atomic age—the idea of a world government (the University of Chicago, site of the first self-sustaining nuclear reaction, became a center for the world government movement with the formation of the Committee to Frame a World Constitution in November 1945).

"Because today and only today, the concept of one total world inescapably thrusts itself forward," Gardner wrote in the preface to her 1948 edition:

> I have been motivated, in preparing this third edition of *Art Through the Ages,* both in the incorporation of new material and in the reorganization of the old, by a desire to present a world panorama of art; to look at the world horizontally; to present a view of Ancient, Medieval, Renaissance, and Modern Art, each as a whole the world over; to show where contacts did or did not exist, and how the world of the relatively isolated cultures of antiquity has gradually become one world, with national barriers so breached that we are now talking of international styles in art ... the panorama becomes particularly valuable at a time when the world has shrunk to its present size; it helps to break down our Europocentric [*sic*] attitude toward art, to reorient our thinking, and to enlarge our horizons ....

True to her word, Gardner provided readers with an ecstatic vision in which "Medieval" Chinese artifacts commingle with the "Renaissance" art of Northwest Coast Indians, the whole culminating optimistically in a chapter devoted to the "Arts of the Machine." Yet little of Gardner's integrated scheme survived the Cold War revision of her text, accomplished by Yale University's art history department under the direction of Sumner McKay Crosby, and published in 1959 as the more familiar *Gardner's Art Through the Ages* (Gardner died in 1946 as her third edition went to press). The new edition

represented a return to "normalcy" in its rejection of globalism, reinstatement of traditional hierarchies, and reinforcement of temporal and spatial boundaries. In its imperialistic universalism, the Yale edition recapitulated the divisions of the postwar world order, and the effects are several. The (presumably) distinctive stylistic coherence of European art was preserved, but at considerable expense: on the one hand, the "mass" productions of the so-called minor arts (so important to Gardner's discussion) were eliminated from consideration side-by-side with works bespeaking individual genius, and, on the other, canonical works which originated in widespread practices of artistic appropriation were reappropriated into the realm of pure art. Most significantly, for the purposes of this article, discussion of what had been the goal of Gardner's insistent teleology, industrial design, disappeared without a trace.

An Art Equal Parts Poetry and Pragmatism
It had been the dream projected in 1928 by R. L. Duffus (on behalf of the Carnegie Corporation, which financed his study) that a truly American art, an art equal parts poetry and pragmatism, would issue from SAIC:

> To make the commercial arts finer and the fine arts, if not more commercial more practical [, i]n this direction, if anywhere, must lie our approach toward an American Renaissance—the birth of a new national art. For it means that the artist will come out of the most powerful forces of his own time. Such, one feels, is the vision taking form at Chicago. The Art Institute is, at all events, in a good position to train just such artists....[55]

And it must have seemed likely, from that vantage point, that an unprecedented fusion of science, art, and industry was imminent. Yet Chicago is better known today for the apparent divergence of its fine and applied arts traditions—the former associated with the figurative expressionists emerging from SAIC in the post-World War II era, and the latter with Moholy-Nagy's New Bauhaus (later School of Design and, after 1944, Institute of Design).[56] In fact, the separation of fine and industrial arts education in Chicago was accomplished not so much through the opening of the New Bauhaus in 1937 ("Everyone is talented," Moholy-Nagy insisted on that occasion—an unmistakably progressive claim)[57] as it was through the literal absorption of that institution into an engineering school, the Illinois Institute of Technology—and the resignation of a number of its faculty in response to what was perceived as the crass commercialism of the move—in 1955. Of course, by that year a number of things had changed in Chicago, as elsewhere. The rapid growth of the field of industrial design, which began in the 1930s, had created a demand for specialized training: it would be the appointment of one of these newly professionalized designers, Jay Doblin, as direc-

tor that so incensed Institute of Design faculty in 1955.[58] The first Bachelor of Fine Arts (BFA) degree in industrial design was offered in 1935 by the Carnegie Institute of Technology, today's Carnegie Mellon University, and quickly became the professional benchmark.[59] SAIC began to offer the BFA in 1934, reorganizing itself into two divisions, a School of Fine Arts and a School of Industrial Arts after 1938. Students at SAIC after 1938 started with an integrated foundation year comprised of life drawing, design and lettering, composition, and art history. From there, however, they moved in two very different directions: towards industrial design, ceramics, stage design, dress design, interior architecture, architectural sculpture, advertising and printing design, and fashion illustration on the one hand, or towards drawing, painting and illustration, sculpture, and art education on the other. Within each of these "majors" was a rigidly prescribed sequence of specialized courses. [60]

The end of the era of integrated arts education in the United States was encouraged as well by Cold War imperative to separate the realms of the material and the spiritual, beginning with the rejection of the "degraded" products of mass culture in Clement Greenberg's "Avant-Garde and Kitsch" of 1939, and continuing with such arguments as Alfred H. Barr, Jr.'s 1952 "Is Modern Art Communistic?" a defense of avant-garde painting and its "democratic" values, or Meyer Schapiro's suggestion in his 1957 "The Liberating Quality of Avant-Garde Art" that the significance of avant-garde (especially abstract expressionist) painting lay in its positing of an alternative to the technological extremes of corporate capitalism. Fine arts education became increasingly subjective— dominated by larger-than-life figures such as German immigrant painter Hans Hofmann, who drew sharp distinctions between the fine and the applied arts even as his formulaic teachings continued to aestheticize, nostalgically perhaps, the distinctive methodologies of integrated arts education. Of course, in this highly charged atmosphere, an equally heroic image for industrial design would be requisite. The new generation of industrial designers sought, and achieved, their own status as celebrities.

1   Howard Singerman, *Art Subjects: Making Artists in the American University* (Berkeley, Los Angeles, and London: University of California Press, 1999).

2   Thomson concentrates on the case of Philadelphia, another early center of both the printing industry and art education reform. Ellen Mazur Thomson, *The Origins of Graphic Design in America, 1870–1920* (New Haven and London: Yale University Press, 1997).

3   Helen Lefkowitz Horowitz, *Culture & the City: Cultural Philanthropy in Chicago from the 1880s to 1917* (Lexington, KY: University Press of Kentucky, 1976).

4   From William G. Whitford, *An Introduction to Art Education* (New York and London: D. Appleton & Co., 1929). Whitford was professor of art education in the University's School of Education.

His book, intended as a reference for introductory college courses in art education, surveyed the state of art education in the United States, including assessments of need, available courses of study, theory, methodologies, and, especially, tests and measures; all arrayed in graphic form.

5   On South Kensington and its first director Henry Cole, see Stuart Macdonald, *The History and Philosophy of Art Education* (New York: American Elsevier Publishing Co., Inc., 1970), 169–170, 181–182. Industrialists in several American cities, notably Boston, New York, Philadelphia, and Washington, DC, took their cues from South Kensington and established ambitious art school-museum complexes of their own following the Centennial Exhibition held in Philadelphia in 1876. Steve Conn, *Museums and American Intellectual Life, 1876–1926* (Chicago and London, University of Chicago Press, 1998).

6   See *Framing the Past: Essays on Art Education,* Donald Soucy and Mary Ann Stankiewicz, eds. (Reston, VA: National Art Education Association, 1990); especially Paul E. Bolin, "The Massachusetts Drawing Act of 1870: Industrial Mandate or Democratic Maneuver?" 59–68 and Patricia M. Amburgy, "Culture for the Masses: Art Education and Progressive Reforms, 1880–1917," 102–114.

7   This is the vision that came to spectacular fruition in Chicago at the World's Columbian Exposition of 1893: the shift is embodied nowhere more tangibly than in the physical structure still occupied by the Art Institute today. Built in grand, Beaux Arts style to house educational and religious congresses at the Exposition, the Art Institute of Chicago sits proudly on the remains of the former exhibit hall of the Chicago Interstate Industrial Exposition (a fact which accounts for the peculiar circumstance of a major art museum straddling a still-active railway system). The Exposition Hall was erected in 1872, one year after the infamous Great Chicago Fire, in order to demonstrate to the outside world that business would continue as usual in the devastated city. Among its displays of commercial goods and commodities (including livestock), the Exposition Hall included a prestigious annual art exhibition known in Europe as the "American Salon." Microfilmed records of the Art Institute's scrapbooks indicate that the Industrial Exposition held its last art exhibit in 1890, at which time its directors (many of the same businessmen on the Board of the Art Institute) agreed to raise $100,000 for the new building of the Art Institute in exchange for use of a portion of it for its own industrial and fine arts exhibitions.

8   *The Art Institute of Chicago, School Catalogue* (Chicago: The Art Institute of Chicago, 1901).

9   First systematized in 1847 by Horace Lecoq de Boisbaudran (instructor in memory sketching at the Ecole du dessin, the French government's industrial art school), this aestheticized and romantic version of memory sketching had flourished in what Albert Boime has described as the atmosphere of increasing appreciation for the goals of popular drawing instruction in France codified in that country's educational reforms of 1863. Lecoq de Boisbaudran, *The Training of the Memory in Art and the Education of the Artist,* trans. L. D. Luard (London: Macmillan and Co., 1911). Albert Boime, "The Teaching of Fine Arts and the Avant-Garde in France During the Second Half of the Nineteenth Century," *Arts Magazine* 60 (December 1985).

10   The academic tradition itself had moved in this direction, as Albert Boime long has maintained. Pedagogical reforms initiated during the Second Empire in France and directed towards training a new generation of industrial designers (both by making fine artists responsive to industry and by educating a wider population in the basic principles of design) resulted in the French Academy's adoption of abbreviated methods of instruction—methods which later proved consistent with the new aesthetic standards of the 1870s. In his 1985 "The Teaching of Fine Arts and the Avant-Garde in France During the Second Half of the Nineteenth Century," Boime insists further that "the École progressively realized the concept of a unity of all the arts," and that this ultimately led to the ratification at the Universal Exposition in Paris in 1900 of geometricizing principles of drawing instruction. See Boime's *The Academy & French Painting in the Nineteenth Century* (New Haven, CT and London: Yale University Press, 1971); "The Teaching Reforms of 1863 and the Origins of Modernism in France," *The Art Quarterly* 1 n.s. (1977): 1–39; and Boime, 1985, 55.

11   Popular mural painter Will Low, an artist who got his start at the Columbian Exposition, targeted SAIC in this regard. Low described SAIC as the largest of American art schools (citing enrollment statistics showing that SAIC was twice the size of the next largest school—the Art Students League of New York—and more than six times larger than the average) and complained that it shouldered a disproportionate share of responsibility (or blame) for glutting the art market with so many ill-prepared young hopefuls. According to Low, art students needed training in composition to be competitive:

   "As at present constituted, our schools serve principally to enable a student to draw and paint, more or less correctly, a figure from life…. He advances through various grades of the school, and at last steps out into the world to find that he has learned how but not what to do…."

   Low laid out his argument in practical terms: art schools were producing more artists than the market reasonably could be expected to absorb. Only a tiny proportion of these possessed the genius to operate ahead of trends and tastes. Therefore, it was the duty of the art school first to be more selective about admitting only students likely to succeed at their profession, and second to provide those students with the tools to practice within the mainstream, commercial art world. The perfect school, he argued, would be similar to the workshops of the Italian Renaissance, where students imbided the secrets of their art through the pragmatics of its execution. Absent this possibility, Low recommended that more significance be attached to such courses in composition as already existed in some art schools. W. H. Low, "The Education of the Artist, Here and Now," *Scribner's Magazine* 25 (June 1899): 766–767.

12   Arthur Wesley Dow, *Composition: A Series of Exercises in Art Structure for the Use of Students and Teachers* (Garden City, NY: Doubleday, Page & Company, 1920).

13   Denman W. Ross, *A Theory of Pure Design: Harmony, Balance, Rhythm* (Boston and New York: Houghton, Mifflin and Company, 1907).

14 I argue elsewhere that the prevalence of compositional theories in art instruction of this period was crucial in the development of vernacular forms of modernism in the United States. Dow, for example, was a significant figure in the development of canonically modernist artists such as painters Max Weber and Georgia O'Keeffe, and photographer Clarence White. Ross was admired by, among others, the Ashcan School realist Robert Henri and his followers.

15 *The Art Institute of Chicago Twenty-Second Annual Report of the Trustees for the Year Ending June 1, 1901* (Chicago: The Art Institute of Chicago, 1901), 33.

16 Among the group which coalesced around Richardson was John Norton. Inspired to become an artist by his sister, Louise, (author of a book on Japanese art, Louise gave John a copy of *Hokusai's Sketchbook* in 1899), Norton's interest in what he described as "the mechanics of decoration" is evident in his major mural commissions including the design for Frank Lloyd Wright's Midway Gardens executed in Chicago in 1912. *Art Institute of Chicago … School of Drawing, Painting, Sculpture, Designing, Architecture … Circular of Instruction for 1905–1906* (Chicago, 1905), 5. The cover of 1906–1907's circular describes the School as comprised of departments (in the following order) of Drawing, Illustration, Sculpture, Painting, Designing, Architecture, and Normal Instruction.

17 French is quoted in *The Art Institute of Chicago Thirty-Third Annual Report for the Year 1911–1912.* Fashionable society artist John Vanderpoel, one of SAIC's five original faculty members, taught drawing via the figure exclusively. Between 1905 and 1906, *The Sketch Book,* a Chicago-based, national art journal whose origins were as the in-house publication for students of the School of the Art Institute, ran a series of articles contrasting Vanderpoel's authoritative approach to the "severe art" of figure drawing with the more "modern" techniques of memory sketching and composition favored by Richardson. *The Sketch-Book* 5 (July and August 1906).

18 When the old Academy of Fine Arts changed its name to the Art Institute in 1882, it was to signal the organization's intention to be an advocate for the present. The Institute prided itself on being current in its early years, courting provocative exhibitions, and striving to bring the best contemporary artists and scholars to Chicago as guest lecturers.

19 On Eakins and the sources of constructive drawing, see Lisa Fellows Andrus's unpublished dissertation, *Measure and Design in American Painting, 1760–1860* (New York: Columbia University, 1976); especially Chapter Five, "The Development of a Practical Basis for Institutionalized Art Education."

20 The architect Frank Lloyd Wright, a major collector of Japanese prints, presented them at AIC in an exhibition of his own design in 1906. Within a few years of O'Keeffe's attendance, poster designer Alphonse Mucha visited the School concurrent with an exhibition of his work (the Scammon Lectures of 1908 and 1909 were delivered by Mucha, a frequent instructor at the Women's School of Applied Art in New York. His subject was "Harmony of Art: Line, Proportion, Color"), illustrator and bookbinder Ralph Fletcher Seymour was engaged for a special class in "decorative line composition," and a new class devoted entirely to the practice of mural painting was introduced.

21 According to Benton, what he learned at SAIC between 1907 and 1908 was his first insights into the art of designing—of consciously planning, or composing, pictures before attempting to execute them: "Japanese prints were, very largely because of James McNeill Whistler's influence, much in favor at this time. Fredrick Oswald, my favorite teacher at the Institute, was enthusiastic about these and encouraged continuous study of the way they were put together. Through continued observation of the prints, I learned to arrange my pictures in definite patterns and acquired a taste, from such artists as Hokusai, for flowing lines which lasted all my life … ."

    Benton's favorite teacher was one of the many upon whom illustrator Fred Richardson had left his mark: Oswald's student years at SAIC coincided with the moment in which the lifelong allegiances were formed which led to sharp divisions among the faculty in 1905. Oswald was touched by Arthur Dow's influence as well: when his name first appears in SAIC's 1902–1903 catalogue, Oswald is listed as an advanced student acting as assistant teacher in the juvenile classes held on Saturdays—this at a time when course work in the school's normal department was required of all student teachers. Thomas Hart Benton, *An American in Art* (Lawrence, KS: University Press of Kansas, 1969).

22 Thomas Hart Benton, "The Mechanics of Form Organization" Parts I–V, *The Arts* (November 1926): 285–289; (December 1926): 340–342; (January 1927): 43–44; (February 1927): 95–96; (March 1927): 145–148. A greater irony than the American reception of Bauhaus pedagogy described by Singerman may be that the formative moment for the paradigmatically personal and spontaneous art of Benton's best-known student, abstract expressionist Jackson Pollock, came in the context of a "modernized" pedagogy with roots in nineteenth century industrialism. (This is the subject of my article "Jackson Pollock's Industrial Expressionism," in progress).

23 "The Democracy of Art," and "How the Art Institute of Chicago Has Increased Its Usefulness," respectively.

24 *The Art Institute of Chicago Annual Report for the Year 1915,* 41.

25 On March 31, 1915, the newly formed School Committee, chaired by conservative trustee Frank Logan (Logan's wife later founded Sanity in Art, a group devoted to countering modern art in all its forms), heard a proposal from Emma Church, then director of the Chicago School of Normal and Applied Art [CSNAA]. Previously director of SAIC's principal rival, the commercially-oriented Chicago Academy of Fine Arts (founded in 1900 as a school for the "modern" arts of mural painting, advertising, and illustration; the Chicago Academy of Fine Arts had hired a number of Frederick Richardson's students, including John Norton), Church addressed the committee on the possibility of establishing an affiliation between SAIC and CSNAA. Yet on April 8, 1915, the school committee voted unanimously to reject Church's proposal. The consensus among its members

was that a vocational program such as CSNAA offered would detract from SAIC's "higher aesthetic goals." *Minutes of the School Committee Meeting,* Archives of the Art Institute of Chicago, 3-5ff (includes a four-page letter from Church detailing her proposal).

26 At the time, Chicago had the most arts and crafts societies outside of Great Britain, according to Eileen Boris, *Art and Labor: Ruskin, Morris, and the Craftsman Ideal in America* (Philadelphia: Temple University Press, 1986).

27 *The Art Institute of Chicago Annual Report for the Year 1916.*

28 Ralph Pearson's 1925 *How to See Modern Pictures,* among others, harnessed Hambidge's technique to a vision of progressive consumerism with chapters on the discerning arts of furniture arrangement and shopping.

29 Eggers had brought Ashcan School realist George Bellows to Chicago as visiting instructor in conjunction with a major exhibition of the painter's work he was organizing for AIC in 1919. Bellows, who for some years had admired the design theories of Denman Ross, was well under the spell of "dynamic symmetry" by that time—as was his mentor Robert Henri. (Henri even organized and circulated an unpublished treatise on dynamic symmetry, outlining the geometric system for his students in the interim before the appearance of Hambidge's first book.) During the three months that Bellows spent teaching and painting in Chicago, dynamic symmetry was the basis of his practice. Before he left, Bellows convinced Eggers that Hambidge should deliver AIC's Scammon Lectures for 1920. Dynamic Symmetry found its niche in academia after Hambidge joined Denman Ross as a Sachs Fellow at Harvard between 1918 and1919. Though it was controversial among archeologists, the appeal of Hambidge's system for pictorial artists was its promise of certainty. Ross was among the most enthusiastic of Hambidge followers, even devising his own mechanical measuring tool—described in excruciating detail in Hambidge's book—to facilitate the correct application of the sequence of diagonals.

30 *Minutes of the School Committee* (Archives of the Art Institute of Chicago).

31 *Minutes of the School Committee* (Archives of the Art Institute of Chicago).

32 In light of subsequent events, it seems reasonable to assume that this is the moment of Eggers's undoing, for the committee approved his plan at the same time it confirmed a school budget with little or no capital investment in change. SAIC dean Theodore Keane's angry letter of resignation arrived within ten days, although it would not be read into the School Committee's record until May 28th, one day after the death of Newton Carpenter, AIC business manager and former director *pro tem. Minutes of the School Committee* (Archives of the Art Institute of Chicago), 161–178.

33 *Catalogue of the Art School of the Art Institute of Chicago, 1918–1919,* 10–11.

34 James Parton Haney, "Our Needs and Opportunities in the Industrial Arts," *The American Magazine of Art* 11 (November 1919): 53–61.

35 Lloyd C. Engelbrecht, *The Association of Arts and Industries: Background and Origins of the Bauhaus Movement in Chicago,* (Unpublished dissertation, University of Chicago, 1973).

36 Ellen Mazur Thomson, "Thorstein Veblen at the University of Chicago and the Socialization of Aesthetics," *Design Issues* 15:1 (Spring 1999): 3–15.

37 Their evolving ideas on design were affected by association with William Torrey Harris, United States Commissioner of Education 1889–1906. Art was a conservative force for Harris, a way of preserving the great ideals of past civilizations. Harris believed that the arts, philosophy, and religion were three paths by which humanity reached toward the divine, and he singled out music, the visual arts, and literature as the great civilizing agencies in the school curriculum. An education in art, according to Harris, placed greater constraints on personal action; it could, in other words, be harnessed for purposes of social control. As his ideas were popularized, picture study, along with programs for the decoration of the elementary schools with art reproductions and plaster casts of statuary, began to be

supported by public-spirited groups throughout the country. Patricia Amburgy has made the pertinent observation that Harris's conservative revolution was on some level indistinguishable from the progressive movement in education championed by reformers such as Jane Addams in Chicago. Patricia M. Amburgy, "Culture for the Masses: Art Education and Progressive Reforms, 1880–1917" in *Framing the Past: Essays on Art Education,* Donald Soucy and Mary Ann Stankiewicz, eds., 102–114.

38 Henry T. Bailey, "Report" in *Fifty-Fourth Annual Report of the Board of Education... 1889–90* (Boston: Wright & Potter Printing Co., State Printers, 1891), 201–213.

39 The creation of instruments of measure was a priority. One of the most influential studies completed under Sargent's direction was Fred Carleton Ayer's investigation into the psychology of drawing. Prompted by interest in the relationship between drawing styles and the processes of scientific inquiry, Ayer's study lent credence to older notions of connections between drawing and cognition. Ayer concluded that, although there was no correlation between representative drawing (i.e., a drawing "which reproduces as accurately as possible the exact appearance of an object") and ability in analytical observation, there was a small but significant correlation between a child's ability to describe a thing verbally and his or her ability to render its salient characteristics in diagrammatic (nonimitative) form. Ayer's study under Sargent's direction, *The Psychology of Drawing* (Baltimore, MD: Warwick & York, Inc., 1916), 135–136, is remembered best today through its prominent citation in E. H. Gombrich's justly famous *Art and Illusion: A Study in the Psychology of Pictorial Representation* (Princeton, NJ: Princeton University Press, 1960), 146–147.

40 A Harvard-trained specialist in Florentine painting, Offner earned his Ph.D. in 1914 under Max Dvořák in Vienna. Offner taught at the University of Chicago from 1915 to1920, spent the following two years at Harvard, and the majority of his long and distinguished academic

career on the faculty of the Institute of Fine Arts at New York University.

41 Walter Sargent, *Instruction in Art in the United States* [advance sheets from Biennial Survey of Education in the United States, 1916–1918] (Washington, DC: Government Printing Office, 1919), 29–30.

42 The University formed a Committee on the Reorganization of the Department of the History of Art in 1922. The Committee's recommendations to President Burton included hiring a new Chair, Frank Mather, Professor of Art and Archeology at Princeton, and several new faculty members. Burton's swift reply—that no funds would be diverted from the existing budget—resulted in Sargent's ascension. Sargent immediately embarked on an ambitious fundraising program. From The President's Papers, 1895–1925, Archives of the University of Chicago.

43 *Chicago Tribune,* April 17, 1927.

44 In fact, Sargent's death initiated an intense struggle for power within the department. The major antagonists were Lucy Driscoll, a graduate of the University and longtime instructor in Asian art, and Edward Rothschild, a historian of modern art appointed by Sargent. In her bid to President Mason (Burton died in 1925), Driscoll argued for a program based on psychological principles. She dismissed both Princeton and Harvard as models, describing the project of the former as more archival than interpretive, and that of the latter as too beholden to, on the one hand, biography, and, on the other, the formulaic assumptions of Denman Ross (Driscoll refers to these as "psychologically the reverse of any normal creative progress so one can scarcely expect results"). Rothschild's response reiterated the positivism of Sargent's tenure and is representative of the direction in which the department subsequently developed: "To teach appreciation of art is only to teach how to see, and I should prefer to shun the feeble and perhaps dangerous assistance of psychology in an introduction to the subject ... it is the vision not the resultant thought or action which is significant." The President's Papers, 1925–1945, Archives of the University of Chicago.

45 *Annual Report of the Art Institute of Chicago for the Year 1920,* 12.

46 The Report of the Trustees for 1919 indicates that the School's attendance had dipped twenty-eight percent. *Annual Report of the Art Institute of Chicago for the Year 1919,* 37. Charlotte Moser, "'In the Highest Efficiency': Art Training at the School of the Art Institute of Chicago" in *The Old Guard and the Avant-Garde: Modernism in Chicago, 1910–1940,* Sue Ann Prince, ed. (Chicago and London: University of Chicago Press, 1990), 204. Moser's generally excellent article falls short of recognizing the role of Eggers.

47 *Annual Report of the Art Institute of Chicago for the Year 1920,* 18–19.

48 *Annual Report of the Art Institute of Chicago for the Year 1921,* 15–16.

49 Ensign is quoted in R.L. Duffus, *The American Renaissance* (New York: Alfred A. Knopf, 1928), 139.

50 Ernst Detterer, his students, and the printing arts program are discussed in Victor Margolin, "Graphic Design in Chicago," *Chicago Architecture and Design, 1923–1993* (Munich, London, and New York: Prestel, 1993), 285–286.

51 Charlotte Moser, "'In the Highest Efficiency': Art Training at the School of the Art Institute of Chicago" in *The Old Guard and the Avant-Garde: Modernism in Chicago, 1910–1940,* Sue Ann Prince, ed.

52 Promoting a fusion of fine and industrial art was a growing trend in the 1930s in the fields of art history and appreciation. The Museum of Modern Art hosted its *Machine Art* exhibition in that decade, and Sheldon Cheney and Martha Cheney published their study, *Art and the Machine: An Account of Industrial Design in 20th-Century America,* in 1936.

53 Ernest Batchelder, *Design in Theory and Practice* (New York: The Macmillan Company, 1910), 233.

54 *The School of the Art Institute of Chicago, Catalogue for the Year 1926–1927.*

55 R. L. Duffus, *The American Renaissance* (New York: Alfred A. Knopf, 1928), 139. Duffus underscored this idea elsewhere by noting that "The Art Institute of Chicago, now well along in its sixth decade, is said to have had in its classes at one time or another one-fifth of all living American artists" (in Frederick R. Keppel and R. L. Duffus, *The Arts in American Life* [one of a series of monographs published under the direction of the President's Research Committee on Social Trends embodying scientific information assembled for the use of the Committee in the preparation of its report entitled *Recent Social Trends in the United States*], [New York and London, McGraw-Hill Book Company, Inc., 1933], 37–38).

56 The most recent iteration of this is Franz Schulze, "Art in Chicago: The Two Traditions" in *Art in Chicago, 1945–1995,* Lynne Warren, ed. (Chicago: Thames and Hudson and Museum of Contemporary Art, 1996), 13–34. I discuss the socio-political context in which the once fluid Chicago situation came to be thus characterized in my article "Pride of Place," pages 53–68, same volume.

57 Alain Findeli, "Moholy-Nagy's Design Pedagogy in Chicago, 1937–46," *Design Issues* 7: 1 (Fall 1990): 4–19.

58 Peter Selz, "Modernism Comes to Chicago: The Institute of Design" in *Art in Chicago, 1945–1995,* Lynne Warren, ed. , 48–49. A number of former Institute of Design faculty and students joined the Chicago branch of the University of Illinois on the eve of its move to its new Chicago Circle campus. They would be instrumental in shaping that school's ongoing commitment to Moholy-Nagy's vision.

59 The idea of a degree-granting program in industrial design at Carnegie was conceived by a graphic artist, Donald R. Dohner, and implemented with the support of a painter and instructor of design, Alexander Kostellow. Kostellow and his colleague (and wife) Rowena Reed Kostellow later joined with Dohner to create an industrial design program for Pratt in 1938. See Arthur J. Pulos, *The American Design Adventure, 1940–1975* (Cambridge, MA and London: The MIT Press, 1988), 164–171. Jay Doblin, a designer with the firm of Raymond Loewy and director of the Institute of Design from 1955 to 1969, was among the many students trained by the Kostellows at Pratt.

60 *Bulletin of The Art Institute of Chicago* (February 1938): 15.

The Pan Am Terminal at Idlewild/Kennedy Airport and the Transition from Jet Age to Space Age
Thomas Leslie

"L'avion accuse ..."
—*Le Corbusier,* Aircraft, *1935*

The aircraft's "indictment" of architecture continues to the present day, its warping of perceptual space and time having altered our conceptions of global, urban, and architectural environments. Architects, while inspired by the scale and technological intensity of the aircraft, rarely have risen to its challenge, and it is uncommon to find an air terminal that enhances, rather than diminishes, the experience of travel.[1] Yet terminal buildings continue to be seen by airlines as opportunities for positioning and branding, since they are the only permanent fixtures on the airport skyline—along with hangars at the edge of an airport—to which their logos are affixed. There is a long history of "flagship" terminal buildings that attempt to crystallize the imagery and experience of a particular airline, and to celebrate the technology and speed of its aircraft. Terminal buildings thus are convenient sources of cultural archeology because the mode of their obsolescence gives us glimpses of the relationships between corporate and popular culture, technology and style, and our vehicles and the cities they inhabit or transgress.

Nowhere is this palimpsest of aviation and architecture more suggestive than at New York's Kennedy Airport, where an "encyclopedic" collection of terminal structures was built between 1955 and 1975. While often successful in achieving a measure of popular acclaim, all of the original terminals have either undergone major reconstruction as the requirements of air travel have changed, or been demolished to make way for a more contemporary intervention. The earliest of these radical transformations occurred at the Pan American terminal, built from 1957–1960, and modified only eight years later from 1968–1973. The original terminal, an elliptical concrete parasol with a crystalline set of passenger spaces beneath, had been an icon of jet-age travel, and was the centerpiece of a larger campaign by the airline to present itself as the most sophisticated and technologically progressive travel company in the world. Yet the changing exigencies of airline operations in the "jumbo jet" era forced Pan Am to replace the terminal with a labyrinthine complex of

1   See, for example, Norman Foster's paean to the 747 in Ruth Rosenthal and Maggie Toy, *Building Sights* (London: Academy Editions, 1995).
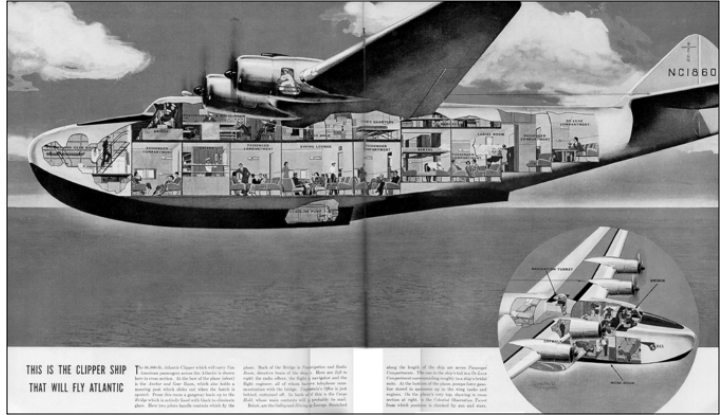
quickly constructed gates, parking, and service areas. The ingestion of the original "jetport" by the new "worldport" was a summation of the changing relationship between humans and their machines in the 1960s, creating a dislocating experience of numbing complexity in what had been a precinct dedicated to the clear exposition of our bodily place in the technosphere. Seen in the context of Pan Am's corporate imagery campaign, the terminal at Kennedy is a precise indicator of the industry's change in focus from the provision of experience to the commodification of travel.

Background—Pan Am and Idlewild

New York's Idlewild Airport and Pan American World Airways both rose to prominence in air travel and popular culture in the 1950s, at the height of postwar expansion. Led by founder Juan Trippe, Pan American combined advanced aviation technology with a canny sense of public relations and marketing. Trippe formed a working alliance with aircraft designer Igor Sikorsky, who developed seaplanes to meet Pan American's need for landing and takeoff operations from island bases throughout the Caribbean and the Pacific. The company's "Clipper Cruises" offered their passengers

ship-like travel experiences including "white-glove" cabin service on board, spartan but comfortable "hotels" at overnight island stops, and elegant art deco terminals at its San Francisco and Miami bases. At the height of its Pacific service in the 1930s, the airline's Boeing 314 "China Clippers" offered cabin interiors designed by Norman Bel Geddes, featuring cruise-like staterooms and sleeping berths for seventy-four passengers, a second deck for crew accommodations, and a deluxe compartment in the rear of the aircraft "corresponding roughly to a ship's bridal suite." [2]

Pan American's advertising campaigns and corporate design efforts of the era set the stage for its later, better known imagery. The Boeing 314 Clipper was the signature of the airline, its streamlined bulk appearing in not only Pan American's advertising, but also in that of its corporate partners—in particular purveyors of liquor, tobacco, and luxury goods. The company sold the 314 as a comfortable means of travel and a technological marvel, using pictures of its wood-lined interior cabins and its massive engines together to equate speed and pleasure. Pan American's advertising also suggested that the exotic destinations it reached—including South America, China, and Europe by the mid-1930s—were easily within the grasp of a new class of traveler. Asian and South American trips were sold on weekly and monthly bases, coinciding with convenient quantities of vacation time, and the flights themselves were touted as worthy successors to the less affordable luxury cruises of the day. Beginning in 1929, the company branded its aircraft and its advertisements with a winged globe, turned to feature the South Atlantic and feathered back into the slipstream of the aircraft, a symbol not unlike other airlines, but far more prevalent in skies worldwide.

By 1950, a new generation of Pan American travelers were boarding larger DC-4s, Stratocruisers, and Constellations at newly constructed or refurbished airports. While most of the Clippers' colonial-style luxury had been eliminated, the new aircraft were popular for their smooth rides and their turboprop-powered speed.

2   Barnaby Conrad III, *Pan Am: An Aviation Legend* (Emeryville, CA: Woodford Press, 1999), 134.

The double-decked Stratocruiser, with interiors by Walter Dorwin Teague, featured one-hundred seats on its top level, with a bar and lounge below accessible via a spiral staircase. While the single-level Constellation lacked the drama of the onboard staircase, it offered an elegant profile accentuated by a triple tail and a gently angled fuselage, emphasizing its air-streamed curves and suggesting its power. If the Stratocruiser suggested a continuation of the "flying cruise ship," the eighty-one-seat Constellation was something new, a passenger aircraft in which the experience of the flight itself seemed to be exciting enough, without the distractions of a lounge. While airports developed to accommodate the new travelers and aircraft, airport architecture remained relatively static, with lingering suggestions of rail stations still dominating most terminals. Aircraft remained parked on a tarmac while they were loaded, and the walk across a windswept tarmac to a moveable metal staircase remained the quintessential boarding experience, offering an intimacy with the aircraft that was thrilling, if awkward.

Pan Am's imagery continued the themes of its Clipper era, albeit targeted at a slightly new class of traveler. Advertising now emphasized the speed of the aircraft, pointing out that one could take a week's vacation and spend nine days in Europe, thanks to the overnight flight heading east and the time change heading west. This synthesis of aeronautical technology and domestic scheduling was paralleled by a continued emphasis on the exotic locations being made available to travelers at all levels of the economic spectrum. From those able to afford berths in the "Presidential Class" aboard Stratocruisers to those taking advantage of the somewhat less commodious "Rainbow Class" aboard DC-4s, travelers around 1950 continued to find themselves enmeshed in Pan Am's all-encompassing presentation of world travel. The company not only sold seats on its aircraft, but also all-inclusive one- and two-week travel packages to destinations throughout Europe, the Pacific Rim, and the Americas.

While Pan Am was moving into the Constellation era, New York City was developing plans for a "skyways depot" in Queens, on the former Idlewild Golf Course.[3] Although plans in 1943 called for a monumental promenade and terminal, runway layouts and passenger handling gradually evolved to reflect the changing nature of commercial flight.[4] By the late 1940s, these included parallel runways for simultaneous landing and takeoff, however designs for the central terminal continued to show a single structure with only fifteen aircraft gates.[5] When the Constellation was introduced, development of Idlewild focused on larger, more efficient schemes. After control of the project passed to the New York Port Authority, plans for a central terminal were discarded in favor of a dispersed collection of buildings to be designed and funded by each airline. This 655-acre "Terminal City" was planned around a looping access

3   "World's Greatest Airport to Serve Skyways of Tomorrow," *Popular Science* (August 1943): 75.

4   "Final [sic] Plan for Idlewild Airport," *The New York Times* (August 6, 1944).

5   "Lines Accept Plan for Idlewild Filed," *The New York Times* (August 6, 1944).

road and a series of stylized landscaped *allees,* and was occupied first by the multi-line Arrivals Building and control tower built from 1955 to 1957.[6]

In 1957, Pan American was among the first airlines to reveal plans for its terminal on a site west of the Arrivals Building. Designed by Tippetts-Abbett-McCarthy-Stratton, the proposal wedged nine Stratocruiser-sized gates into the tight, sixteen-acre site by adopting a narrow footprint similar to other "finger" terminals. Outbound facilities were lifted above the ground, providing direct connections to aircraft by moveable gangplanks, and eliminating the blustery dash across the tarmac. Floating above the straightforward plan was a cantilevered concrete parasol that would both enclose the terminal interior and hover above the front halves of docking aircraft, allowing passengers to comfortably board in rain or snow. To unify the geometries of the finger terminal, the turning radii of the aircraft, and the automotive loading at the front door of the complex, the roof took on an elliptical geometry, providing a single, striking image surmounting the catwalks and glass walls below. The roof was supported on thirty-two columns located outside of the terminal enclosure, supporting cables that held the tapered edge of the concrete parasol, and balanced by six small tension columns at the center of the terminal. The roof's upward splay and its narrow profile disguised the supporting cables, giving the illusion of an impossibly thin concrete shell shooting out into the space of the tarmac. The overhanging roof and moveable gangplanks thus turned boarding into an architectural event—a transition from land to air in which the detail of moving into the aircraft was carefully considered and which, given the scope of the parasol, became the signature of the complex.

Much as Idlewild's original plan had been altered by the Constellation and the Stratocruiser, the Pan American terminal found itself overtaken by aeronautical developments. While the schematic design presentation showed the model surrounded by propeller aircraft, Pan Am already had ordered the first of its Boeing 707s in 1955.[7] The new jets had profound implications for terminal facilities. While the largest version of the Constellation held one-hundred passengers, the new jets held one-hundred and thirty. While the DC-7 could maneuver parallel to the terminal, the 707's longer body dictated a nose-in arrangement, and the expense of maintaining and maneuvering the new aircraft demanded that servicing, loading, and handling all be performed on station.[8] On a more prosaic level, the jet's engine noise and blast required terminal designs to provide acoustic separation, insulating passengers from the engine noise and the hum of activity as the waiting jets were serviced prior to boarding.

Pan Am's terminal for Idlewild was redesigned rapidly to meet the demands of the 707, changing significantly before its completion in the spring of 1960. Its layout was altered to maximize

6   "Idlewild Test Case." *Newsweek* (December 27, 1948): 54.

7   *The Pan Am Story* (Pan American Airlines, ca. 1969), n.p.

8   John Morris Dixon, "Air Terminals for Jet Travel: New Problems and Trends," *Progressive Architecture* (November 1961): 128.

Figure 5
The Boeing 707 in Pan am livery. While not the first commercial jet transport, the 707 became the aircraft ot the choice for the jet-set generation.
Pan American Airways.

Figure 6
Interior view of Pan Am's "Jet Clipper" service to Europe. The 707 cut travel time dramatically, obviating the need for separate lounges or sleeping berths. Instead, the flight itself condensed the cuisines, cultures, and sensibilities of the destination at the passenger's seat, heightening the experience of flight itself.
Pan American Airways.

9   "Phenomenon of the Jet Age: The Dazzle of Idlewild," *Life* (September 22, 1961): 71.
10 Sandra Knox, "Idlewild Skyline Gets an Addition," *The New York Times* (June 3, 1960) and "Aviation: Umbrella for Airplanes," *Time* (June 13, 1960): 103.
11 Sandra Knox, "Idlewild Skyline Gets an Addition."
12 "Aviation: Umbrella for Airplanes."

the accommodation of the larger jets, with eight spaces for parking under the canopy and two fueling stations further out on the apron. Utilities were reconfigured, and the boarding ramps were redesigned to accommodate nose-in parking for the jets. Facilities for customs were included to supplement the already overcrowded spaces in the neighboring Arrivals Building, and the interior of the terminal was redesigned to include space for restaurants, clubs, and a bar, suspended over the loading apron, catering to frequent Pan Am travelers.

Popular reaction to the new terminal building was universally enthusiastic. Commentators referred to its "umbrella" or "parasol" roof as an architectural event in itself, with *Life* magazine comparing the terminal and its neighbors to a World's Fair site.[9] The functional aspects of the terminal; particularly its short walking distances, doorless air-curtain entrance from the approach road, and mechanized luggage sorting system, were praised as engineering achievements that maximized the efficiencies of scale offered by the new jets. *Time* magazine praised the terminal's ability to "speed and pamper" the traveler, while *The New York Times* suggested that the drama of the aircraft and architecture obviated the need for public art, since the building itself was an exhibition worthwhile on its own.[10] From within, the terminal offered an "unchecked panorama" of the aeronautical ballet through 27-foot high glass panes, while nighttime lighting of the exterior canopy converted the building into a "phosphorescent mushroom" that dominated the low-lying skyline of Idlewild.[11] Even the waiting experience was enhanced, because the interior lighting was orchestrated to dim over inactive gates and brighten over active boarding areas.[12] That such technical solutions could be so elegantly celebrated suggested the power held by the new jets over the traveling public's imagination. New Yorkers not only boarded the new aircraft in record numbers, but also simply showed up at Idlewild to watch the spectacle of the 707s from the catwalks and viewing areas of the terminal.

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By far the most telling endorsement of the terminal was that of *Vogue* magazine which, in October 1960, staged a fashion shoot in and around the new structure. Seeing in the building's "pale, floaty umbrella" a new icon of jet-age fashion, the shoot placed travelers at strategic points throughout the terminal, primarily on the exterior catwalks that linked the building to its exterior boarding ramps, elements that, for *Vogue*, emphasized the cruise-like heritage of the airline.[13] The accompanying article pointed out that the new jet service brought the fashion houses of Europe to within six hours of New York, and suggested that the "jet-oriented" terminal had adopted the practical though stylish fashion sense of the well-appointed traveler. While praising the functionality of the roof and loading system, *Vogue*'s editors were more vocal regarding the aesthetic appeal of the "improbably airy" structure, from the "wraparound" views of the new jets ("lovely, Canaveral-like vapor clouds") to the details of the club rooms ("all Plexiglas, Saarinen chairs, the splash of a tiny fountain, and pleasant food served with some dash").[14]

The Kennedy Terminal was part of a major branding campaign on the part of Pan Am to at once humanize and stylize the technological experience of jet travel. While airlines had previously experimented with advertising and identity to distinguish themselves from one another, the extraordinary efforts of Pan Am in the 1950s indicate the anxiety of the corporation to apply an all-encompassing gloss to what, at least for some, was a disorienting new mode of travel. When Pan Am purchased its new jets in 1955, the airline commissioned designer Edward Larrabee Barnes to transform their old logo—a winged globe with the Caribbean featured prominently—into a new, instantly recognizable blue circle inscribed with abstracted lines of latitude. The obvious implication was that Pan Am was no longer restricted to one easily recognizable hemisphere, and that the new jets could operate throughout the entire globe—not merely the half shown pictorially in the old logo. A more nuanced reading of the blue circle suggests that, in fact, the

13   "New York's Idlewild—The New Look,"
     Vogue (October 1, 1960): 194.

14   Ibid.

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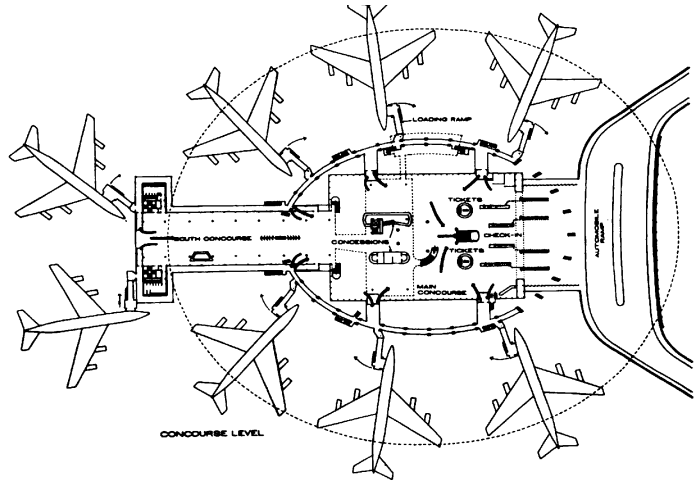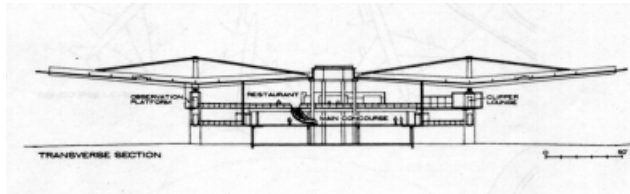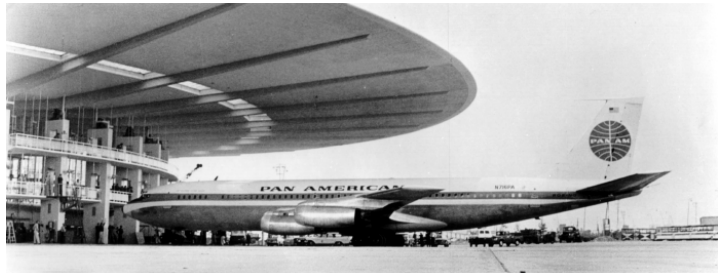
revised logo symbolized the dissipation of the local into the abstract
ether of global travel, an elimination of recognizable land forms and
places in favor of a mathematical representation of navigation and
capital. Whereas the airline's advertising in the early 1950s featured
a globe tilted to reveal its circumferential routes through Europe
and the Pacific, it was perhaps no coincidence that the projection
chosen for the logo emphasized the poles. With the jets' improved
fuel consumption, nonstop flights to Europe could traverse much
further northward, along strict great circle routes, no longer depen-
dent on the hopscotch fuel stops in Gander and Shannon that had
punctuated trans-Atlantic flights on the Constellation.

The instantly recognizable logo served as a graphic ambas-
sador, as a generation of Americans flew to Europe for the first time
aboard the new Jet Clippers. The new "jet set" was young, upper
middle class, and fashion conscious, and Pan Am's carefully orches-
trated identity campaign spoke directly to the developing worldview

of this demographic. Advertisements in *National Geographic, Time,*
and *Newsweek,* in particular, promised that the new technologies
would provide access to "a truly new world—a world you can
grasp—a world you can call your own." [15] The 707 figured promi-
nently in Pan Am's ad campaigns throughout the 1960s, usually
featured in a double-page photograph with copy below promoting
the technical achievements of the new aircraft, and announcing
the low fares made possible by the Jet Clippers. Another, paral-
lel campaign focused on destinations, framing European, Asian,
and Pacific locales within the context of the Pan Am brand. These
advertisements featured lush photography of exotic destinations,
but emphasized their consumability by jet: "These are dreams, but
going makes them real" was one of several tag lines that put potential
passengers in close proximity to the previously unattainable locales.[16]
Stylish graphics featuring cartoons of European figures hinted at
this newfound accessibility, while suggesting that such a trip need
not intimidate novice travelers. Indeed, Pan Am included a range of
travel tips in their promotional literature designed to ease the newly
mobile American middle class into world travel, offering "Dos and
Don'ts" but concluding, optimistically, that European "forms of
etiquette and good manners are the same as at home." [17]

      Pan Am established itself as the premier travel brand during
the 1960s not only with its jets, but also with a related campaign to
ensconce travelers within its carefully designed version of the world
before and after the flight. The company bought a string of travel
agencies and support companies in the 1950s, offering travelers an

15   "Seeing Europe by Pan Am Jet" (Pan
     American World Airways Brochure,
     July 1961).

16   Ibid.

17   Ibid.

integrated booking and planning service. Likewise, the airline's major tenancy in New York's Grand Central City, above the rail terminal, meant that its name and new logo became synonymous with the towering office building that punctuated Park Avenue. Beginning in 1965, passengers could purchase tickets at a Barnes-designed counter in the Pan Am Building, board a rooftop helicopter bearing the airline's logo, and arrive gate side at Kennedy Airport in less than ten minutes. On a wider scale, since 1945, Trippe and Pan Am had assembled a portfolio of hotels under the Intercontinental Hotels brand name. Intercontinental offered American-style rooms in major capitals as well as "odd corners of the world," often at a financial loss. However, the ability to guarantee a recognizable set of amenities at the other end of their journey added further reassurance to the new traveling classes that their "trip of a lifetime" would be not only thrilling, but also comfortable. While Pan Am claimed that their Intercontinental Hotels were not "cookie cutters," but were expressly designed to "please the fussiest traveler," and while adopting regional themes and materials, the hotels showed a remarkably consistent stylistic approach. Paralleling contemporary work for U.S. embassies by Edward Durrell Stone, Intercontinental architecture featured resolutely modernist interpretations of local forms, adding a distinctly American touch to locations from Dacca to Abidjan.[18]

The carefully orchestrated, "aestheticized," and commodious *grand tour* was both enabled and summarized by the experience of flight on a Jet Clipper itself. With famous attention to detail, the interiors of the Pan Am 707s again were designed by Walter Dorwin Teague to replace the separated cabins of the Stratocruiser and Constellation with a single, large passenger compartment. The various rooms of the earlier planes were discarded, and entertainment, meals, and socializing during the flight instead were focused on the passenger seat itself. The airline's literature played down the adventurous nature of earlier flight, opting instead to emphasize the jet cabin's comfort and a sense of heightened normality. "The serene quiet of a Jet Clipper Cabin is hard to imagine," one campaign said, "a pleasure you have to experience to believe.... roomy, quiet, tastefully decorated for warm sociability."[19] Images of in-seat meal service and suit-wearing passengers enjoying drinks and cigarettes gave the appearance of a cocktail party in a comfortable Park Avenue apartment, albeit one traveling at six hundred miles per hour. The shift in attention from the bars, sleeping cabins, and dining compartments of Pan Am's earlier flights represented a major shift in the perception of air travel. The vastly reduced travel time of the jets turned the experience from one of a short cruise to one of a long evening out, as the distractions of getting up from one's seat to change activities were no longer required during a flight of only six and one-half hours.

Pan Am led a tremendously successful effort at normalizing and mainstreaming transoceanic travel during the 1960s, during

18 *Clipper Magazine 747 Souvenir Edition: System of the '70s* (n.p., Pan American World Airways, ca. 1969), n.p.
19 "Seeing Europe by Pan Am Jet."

which air traffic to Europe increased fourfold. Public acceptance and popular acclaim for the Pan Am experience could not, however, disguise the fact that contained within the networks and machinery of the jet age were serious sociological, economic, and urban challenges, none of which were resolved during America's infatuation with the jet aircraft. As early as 1961, Reyner Banham noted the sprawl of the international airport into the surrounding landscape and its attendant suggestion that architecture and urban planning perhaps were not up to the challenge of the 707. In particular, Idlewild's "pointless *Marienbad Allee* in the middle of a spaghetti of roadways and a fairground of competing terminal buildings" for Banham was an indication that, for all the "airy prettiness" of the Pan Am terminal, its architectural solution failed to address the scale of the airside operation.[20] Terminal City itself was only a fraction of the overall complex, with cargo terminals, hangars, and electronic installations covering twelve hundred total acres, about the size of Manhattan south of 35th Street.[21] That this piece of urban real estate offered no legible or human order troubled Banham, who bemoaned the "slummy sprawl" of Kennedy, suggesting instead the elimination of monumental airport architecture in favor of an engineered network of circulatory paths. While the terminal and its brethren had constituted a radical advance when planned in the early 1950s, the jets had usurped "the first airport built for Constellations." While boarding a Pan Am 707 might suggest an "architecturalized" aeronautical experience, it was clear to Banham that the larger urban and functional issues posed by the jets were beyond the scope of architects or planners.[22]

The 707's imagery was only the smallest fragment of its overall design challenge. Most glaring were problems of infrastructure, in both getting to the airport from Manhattan through thickening traffic, and in the handling of the new aircraft, whose popularity outstripped the newly renamed Kennedy Airport's capacity. Throughout the early 1960s, eighty percent of Americans traveling by air to Europe flew through Kennedy, an increasingly unpopular situation because of its growing congestion.[23] By 1968, delays of ninety minutes were common even in good weather as international flights and the domestic lines that fed them competed for air and ground space. Terminal City, which had been planned as a generous, sweeping landscape, became a monstrous freeway interchange, with traffic backing up into Queens. Pan Am's floating umbrella transformed from a glamorous backdrop for jet-age adventurers into a crowded holding tank for increasingly delayed and frustrated passengers, as each flight disgorged 707 populations into spaces planned for Constellations.[24]

New York's Port Authority came up with no definitive plans for relieving the congestion of the 1960s, trapped as it was in political infighting with other city agencies and reluctant to approve solutions outside its jurisdiction.[25] The airlines, however, in conjunction with

20 Reyner Banham, "The Obsolescent Airport," *Architectural Review* (October, 1962): 252.

21 George Scullin, *International Airport: The Story of Kennedy Airport and U.S. Commercial Aviation* (Boston: Little & Brown, 1968), 30.

22 Reyner Banham, "The Obsolescent Airport."

23 William Burrows, "Time Runs Out at JFK," *New York Magazine* 1:17 (July 29, 1968): 14–21.

24 Ibid.

25 Ibid.

Figure 15

The 747 interior promised "all the room in the world," yet its interior provoked a sense of dislocation and spatial confusion to match that of the terminal. Pan American Airways.

26   John F. Pearson, "New Era in Air Travel," *Popular Mechanics* (December 1969): 108–111.

27   The development of the 747 seat is described by Niels Differient in "Design with Backbone," *Industrial Design* (October, 1970): 44–47.

28   Calvin Trillin wrote convincingly of the "hump's" popularity as a lounge, noting that the new class of "Traveling People" seemed obsessed with "seeing some-thing from twenty thousand and fifteen feet that [they] couldn't see from twenty thousand." Calvin Trillin, "U.S. Journal: NY/LA/NY: A Traveling Person on a Beautiful Place," *The New Yorker* (April 4, 1970): 66–77.

29   Early advertising used the catch phrase "The plane that's a ship, the ship that's a plane," tying the 747 experience directly to that of the then more familiar cruise ships.

30   Various print advertisements from ca. 1969 appearing in *Esquire, Newsweek,* and *Playboy.*

Boeing, arrived at a solution to airside congestion by reconceiving the jet itself to maximize efficiencies of scale. In 1965, Boeing began revamping a rejected proposal for an Air Force freighter into the 490-seat 747. With double-width boarding doors, a two-aisle layout, and an internal power source that eliminated the need to "plug in" while at the gate, the new plane provided exponentially greater airside efficiency to the airlines.[26] Within the new "Jumbos," passengers were offered unprecedented comfort and amenities, including meals prepared in larger, better-equipped galleys, wide-screen movie projection, and ergonomically designed seats.[27] Most notably, the trademark "hump" of the 747 contained a separate lounge reached by a spiral staircase, bringing back the popular amenity of the Stratocruiser and unwittingly creating the most exclusive club space of the early 1970s.[28] Proclaiming the dawn of the "spacious age," Pan Am was the first airline to place orders for the 747, touting its comfort, speed, and efficiency to customers by once again comparing the new flying experience to cruise ships, with "state-rooms" and "salons" in first class, and "living rooms" in economy.[29] Rather than emphasizing the speed or sensations of jet travel, Pan Am's advertising campaign was geared toward a new class of less-experienced travelers, and it substituted the sophisticated elegance of flying the 707 with the calm ordinariness of the Jumbo. The "hotel on wings" offered "big fun on the big plane where the big thing is comfort" with, in the airline's new trademarked slogan, "All the Room in the World."[30]

If the jumbo jets offered economies of scale on the tarmac and new levels of comfort within their cabins, they had complicated effects on the ground. While boarding itself was studied and planned for maximal efficiency, the already congested network of highways, parking lots, and pedestrian circulation at Kennedy proved instantly and disastrously insufficient for the new scale.[31] Pan Am faced particularly acute problems. Because of the building's narrow site, the original footprint could accept neither the wingspan nor the turning radius of the 747. Similarly, the terminal's waiting areas were not adequate for the new scale of passenger embarkation. The only possible solution was to build out into the apron, providing

The first class lounge of the 747, in a contemporary rendering. The "flying room" removed travelers from the sensations and visible evidence of flight, focusing inward on the distractions such as Cinerama movies, international cuisine, and the endless supply of cocktails, particularly on the "gin flights." Pan Am Airways.

gates configured especially for the "Jumbos." Designed by TAMS consultants, the successor to Tippets-Abbot-McCarthy-Stratton, the new "Worldport" wrapped a narrow strip of check-in facilities, waiting areas, and boarding gates around a central area reserved for parking—all thrust out into the space of the airside apron. This strip was linked to the original terminal at both ends, forming an irregular trapezoid with three 747 gates lined up on each long leg, and gates for smaller aircraft along the far side. The original terminal was retained but altered, with enclosed jetways providing access to smaller jets and a new administration block disguising the transition to the addition. While the front entrance of the terminal was maintained, an additional roadway was built through the existing basement, forming arrivals and departures levels on the inside of the new structure, a tight loop that included access to rooftop parking. Within the new terminal, shops, lounges, and amenities crowded the Worldport corridors, blocking views of the apron. While the original building seemed to project its space into that of the aircraft around it, the new structure was entirely introverted and largely sealed off from the exterior. Built quickly while Boeing was finalizing the production model of the 747, the new terminal building was touted by Pan Am as a "spaceport," where passengers could "drive directly to their flight," eliminating the monumental terminal in favor of a seemingly efficient transport network, computerized luggage handling, and 24-hour commerce.[32]

Upon its full completion in 1973, the reality of the Worldport was considerably less elegant. While its spatial efficiency was unparalleled, it came at the expense of legibility and orientation. Height limitations compressed the new structure, creating low corridors of space, and the wraparound nature of the solution frustrated any possibility of intuitive wayfinding—the turns and short runs of circulation space prevented understanding of the scheme's essentially linear nature. The narrow configuration of the "strip" also created

31 Pan Am refined its boarding procedures in preview exercises to load a full complement of 361 passengers on board a new 747 in less than twelve minutes, likely still a record. "Jumbo Jet-Airport Problems," *U.S. News and World Report* (Jan 26, 1970): 11.

32 *Clipper Magazine 747 Souvenir Edition: System of the '70s* (n.p., Pan American World Airways, ca. 1969), n.p.
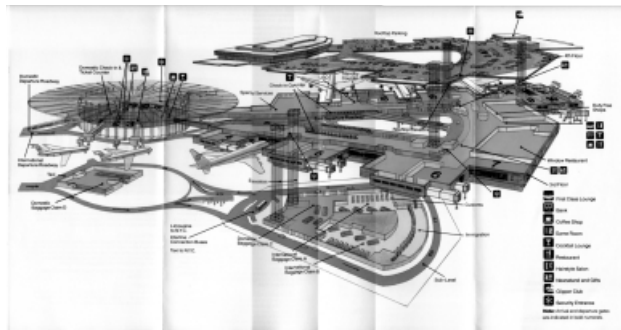
confusing views out through the parking lot into other waiting and
boarding areas. Most disarmingly, the layering of space combined
with its geometry to create strange, counterintuitive pedestrian
movements. One might, for example, disembark from an arriving
plane, descend into the basement customs area by escalator, walk
halfway around the building to collect luggage, and then walk back
to the sub-level arrivals roadway in almost the exact same position
as the aircraft one had just left. Where the original terminal had
emphasized orientation relative to the planes and runways, relying
on intuitive cues to guide passengers to their flights, the new build-
ing was forced to employ an extensive graphics program to route
passengers through a functionally efficient, though experientially
labyrinthine, series of spaces. Even this effort fell short, and passen-
gers eventually were offered an exploded perspective of the termi-
nal entitled "Worldport Made Easy," whose coded key purported
to "assist... in locating the location of Worldport's many facilities,"
a claim that was countered by the complexity of the drawing itself.[33]
The new terminal thus replaced the tangible logic of the original
with a geometrically efficient though experientially insoluble layout,
emphasizing program over diagram, and a puzzle-like utility over
any sense of spatial accommodation.

33 *Pan Am's Worldport Made Easy*
    (brochure, New York: Pan Am, 1982), n.p.

Figure 19
Pan Am's advertising in the Jumbo era replaced the excitement of transatlantic flight with the promise of a soporific, sensation-free experience.
Pan American Airways.

34 Don Raney, "People and Planes: Can Airports Bridge the Gap?" *Progressive Architecture* (September 1969): 92–93.
35 "The 747: Into a New Air Age," *Newsweek* (October 27, 1969): 97.
36 Ibid.
37 "The eye height in the 747 is such that a pilot, in crossing the threshold at his customary eye level, would land well short of the runway.... Pilots in transition [also] consistently underestimate the speed of the aircraft over the ground," Capt. Donald E. Kinkel in "Room at the Top," *Industrial Design* (October, 1970): 48.
38 "Aircraft: Period of Adjustment." *Newsweek* (July 13, 1970): 81.

If the 707 had promised a smooth, sophisticated, and engaging travel experience from start to finish, the 747 suggested an anesthetic experience—one which eliminated all traces of interest or engagement from what was increasingly a crowded, disorienting, and often frustrating occasion. In contrast to the monumental canopy of the original terminal, the new Worldport suggested all the occasion of a large subway station, a comparison made by *Progressive Architecture,* which found the functionality of the new terminal lacking.[34] The bulk of the 747s themselves heightened this lack of kinesthetic awareness, removing the majority of the planes' passengers from the windows. Their aircraft's large diameter created near-vertical cabin walls, disguising the aerodynamic shape of the planes and contributing to the illusion of a "flying room."[35] Because of its mass, the 747's handling was ponderous, and often barely noticeable to passengers even in turbulent air. Takeoffs and landings were absorbed by the plane's mass and slow acceleration, to the point where novice passengers seated away from windows failed to notice when they touched down—an effect exacerbated by the odd perspective in the upper floor lounge.[36] Pilots, too, were isolated by the location of the cockpit on the upper level, such an odd location with respect to the maneuvering nose gear that Boeing provided special training rigs to educate new pilots.[37] The interiors of the plane again were designed by Teague's office, although now with an emphasis on breaking up the massive space of the 747's cabin and a focus inward, toward movie screens and in-seat service prepared by large galleys. Pan Am's advertising, which had in the 707 era emphasized exotic destinations and the lively onboard atmosphere, focused on the numbing aspects of jumbo travel, switching from "big fun" to sleep, distracting entertainment, and a cuisine that featured alcohol as a necessary component of a pleasant journey. Long-haul flights came to be called, in the language of 747 flight attendants, the "gin flights": delays and the boredom of the long haul necessitated "feeding [the passengers] steak and giving 'em all the liquor they can drink" to maintain quiet and order on board.[38] Advertising, which previously had featured images of couples and groups enjoying meals, cocktails, and even games of chess on the 707 now featured individuals asleep in the numbing "comfort" of a 747 passenger seat.

The Worldport was only the most visible and architectural example of the soporific, disorienting effects of Jumbo travel at Kennedy. Outside the terminal's front door, opposite the new extension, Terminal City was quickly beset by new highway infrastructure and parking garages, which obscured and eventually obliterated the original landscaped precinct. Here too, intuitive understanding was trumped by operational efficiency, as the simple ring road was replaced by a complex network of flyovers, off-ramps, and U-turns that forced one to drive past one's terminal and double

back to its designated parking area. The lack of any subway connection left terminal approach ramps crowded with buses providing connections to other terminals, airports, and transportation centers. Extensive graphic programs were necessary at curbside to "orient" the arriving or departing passenger in a milieu that, like the 747 or Worldport interiors, offered little opportunity to locate oneself in relation to the ground or to one's destination. From the monumental ephemerality of the original Pan Am terminal, air travel in the age of the 747 slipped into a disorienting experience in which time, space, and movement were muffled by a combination of hardware, architecture, infrastructure, and cocktails. The sensory conditions of jet lag were matched by a multitude of low, fluorescently lit spaces, and jarringly complex threads of circulation on the ground and in the air—conditions foreseen by Stanley Kubrick's parodic use of the Pan Am logo on the shuttlecraft and transfer station of *2001*. If the 707 had celebrated the stylish experiences of the high machine age, the 747 and its accoutrements broadcast the uncomfortable fact of a technology that had slipped its human connections, trading experience for wholesale systematization.

Conclusions

By 1977, Kennedy Airport and Pan Am were both in the depths of crisis. Congestion on both land and airside had worsened, delays continued, and a crime wave swept the airport, affecting cargo and passenger operations. The crashes of a Pan Am 747 with a KLM flight at Tenerife and of a New York Airways helicopter atop the Pan Am building in midtown, both in 1977, linked the airline with sensational accidents, destroying the façade of the airline's almost paternal, reassuring public face. Pan Am eventually collapsed under the weight of its disastrous 1980 purchase of National Airlines and deregulation-era competition from lower-priced, more flexible carriers. Shortly thereafter, Pan Am sold its interest in the midtown tower to Metropolitan Life, which replaced its logo and removed the airline from the New York skyline. Sales of assets, employee strikes, and the 1988 terrorist bombing of a Pan Am 747 en route to Kennedy doomed the airline, which declared bankruptcy in 1991. Ownership of the Worldport transferred to Delta, which continues to use it and an adjacent terminal today. Current work to build an aboveground light rail system has removed the vista of the floating parasol from the rest of the airport, and conglomerations of retail pavilions, fast-food stands, and security apparatus all have contributed to a further obscuring of the original terminal's crystalline space. While there are no current plans to demolish the structure, an almost archaeological effort of imagination is needed to summon up the jet-age elegance of its heyday.

The saga of the Pan Am terminal can be read as the physical manifestation of a technology evolving faster than our collective abilities to construct for it. Conceived in the Constellation era, the

jetport, like Terminal City, lagged behind the vehicular, economic, and infrastructural developments around it. The 707s were barely accommodated by the original structure, and the subsequent recon-figuration of the Worldport was a panicked response to the rapid arrival of the 747s. This, like so much airport architecture of the era, suggests that architecture and construction, for centuries the resi-dence of the most advanced human technology, had been finally, definitively surpassed by vehicular and aeronautical engineering at all levels—structurally, technically, and perhaps most important, in the popular imagination.

In this surpassing of architectural engineering, aviation suggested the displacement of the human body by its mechanical extensions. While the Stratocruiser and 707 both offered a lingering sense of tactility, perception, and experience, the 747, by its very nature, eliminated much of the contact between our senses and the physical nature of air travel. The artifacts of this era—cabin interi-ors, terminal design, and loading structures—all attest to a sense of insulation from the sensations of flight and an anesthetizing of our awareness of motion, translation, and position within the grids of airports and airspace. It is no coincidence that this transition, from the stylish, intensified experiences of the Jet Age to the plastic, muted ones of the Space Age, was additionally reflected in popular culture of the era. Films and television shows such as the British *Thunderbirds* or Kubrick's *2001* placed an increasing emphasis on hardware rather than (human) software, emphasizing the shift in values and focus brought about by a new technological avant-garde. The 747, like the machines of *Thunderbirds,* suggested a mechanical baroque, a capitulation of our bodies and experience to an overwhelming and gluttonous technology. Such a distinction, between technology as an integrated part of our experience and as a force that sublimates our experience into a larger system of unapproachable complexity, may well serve as a working definition of two distinct eras in postwar design. The "Jet Age," with its heightened sensations, monumental structures, and celebration of the visual, aural, and tactile experiences

suggested a vital connection between our machines and ourselves. This sense all but evaporated as the technology of the Space Age became an independent cultural vector, one that eclipsed human experience as a vital component of mechanical function. Somewhere between the publication of the Pan Am terminal in *Vogue* and its transmogrification into the Worldport, the relationship between aeronautical technology and our human experience underwent a dramatic change, and the thrills of jet travel disappeared in the sclerotic congestion and anesthetizing "gin flights" of the 747 era.

As aviation and aeronautics have developed beyond the 747, some measure of recovery has occurred as more widely dispersed routes have led to smaller, more efficient aircraft. Terminal design likewise has brought back some measure of experience and sensory location, notably at Stansted Airport in Essex, England by Foster Associates, and Kansai Airport by the Renzo Piano Building Workshop. In each of these cases, the design teams offered the primacy of sensation as a fundamental consideration in the terminal buildings—at Stansted, the visibility of the aircraft through the open spaces of the terminal; and at Kansai, the metaphor of a giant wing for the airport's roof. However, with the double-decked, 550-seat Airbus A380, scheduled to begin service in 2006, there is a new functional challenge to airport design, one that will again stress the relationships between the traveler, the aircraft, and the terminal, signifying the ongoing uneasy connections between ourselves and our machines. In this sense, the aircraft continues to both unseat and accuse, reminding us of our contingent attachment to the convenience of aeronautical technology, and of architecture's apparent insufficiency in its face.

The Interface between Design and Management

Rizal Sebastian

Introduction

The escalating complexity of contemporary design projects has been the main reason behind the urgent demand for an innovative management approach to designing. The actual complexity of a design project results from the technical difficulty, the social difficulty, and the uniqueness of design.[1,2] The technical difficulty is the logical consequence of the combination of different functions, forms, structures, procurement, and financial strategies in large-scale projects. The social difficulty is inevitable because of the involvement of a large number of stakeholders and participants with competing and incommensurable objectives. The uniqueness of design is reflected in the nature of the design problem, the design process employed in its solution, and the design practitioner. Most design problems are ill-defined, interconnecting many factors, and always in dynamic tension with the solutions. The design process is iterative, while the analysis often is done through synthesis. The design practitioners possess a unique competence for simultaneously reconstructing the problems and reframing the solutions. They work in knowledge-intensive organizations that cannot be managed only by laying down rules and procedures, which Mintzberg calls "operational adhocracy."[3]

This paper presents theoretical research, and intends to provoke academic discussions that bring a constructive impact to enhance design management study. Although the author was trained as an architect, this paper invites all readers to think about a new relationship between design and management which is believed to be relevant to all areas of design. The selected examples from architecture are intended to clarify the more general line of thinking.

State-of-the-Art of Design Management

There is a wide range of design management approaches. The main approach can be categorized as managing the product, managing the process, and managing the organization.[4]

Managing the product believes that the most important mission of design is to produce physical objects that meet the aesthetic and functional expectations in use, as well as the economical and technical requirements in production. Design management, in this case, is directed to ensure that a design product will meet all

1   Rizal Sebastian, "Multi-Architect Design Collaboration on Integrated Urban Complex Development in The Netherlands," *Journal of Design Research* 3:1 (2003).

2   Rizal Sebastian, "Reflective Design Management: A Socio-Psychological Approach to Multi-Architect Collaboration," *Proceedings of the 2nd International Conference of the Association of Architecture Schools of Australasia* (Melbourne: September 28–30, 2003).

3   H. Mintzberg, *Structure in Five: Designing Effective Organizations* (Englewood-Cliffs, NJ: Prentice Hall, 1983).

4   Rizal Sebastian, "Redefining the Framework of Architectural Design Management," *Journal of Constructon Research* (forthcoming).

value and performance criteria. Design management is responsible for defining the values to be met, translating them into a design brief, and guiding the designers in their understanding of the requirements.[5] In architecture, there are examples of how people try to manage design through the product. The architect supervisor and the municipality "manage" the design by composing architectural blocks in the city's master plan. Certain specialists "manage" the design by calculating and matching the exterior and interior space requirements according to the functions. Some other specialists "manage" the design by measuring the constructability and the efficiency of future utilization.

This approach is weak because it regards design as a static object whose value and performance can be completely defined beforehand. Design management only by composing the objects neglects the process through which the initial demand is assessed and the output is generated. If the preceding process is poor, then any effort to "polish" the product will never really resolve the problem. Management on value and performance probably would raise an interesting academic concept but, in real-world practice, it is almost impossible to continuously measure and formulate these parameters. The situations, the people, and the design products are repeatedly changing, and so are the value and the performance criteria.

Managing the process believes that management effort must be mainly focused on the design process. Design management should not interfere with the designer's prerogatives regarding the "quality" of design products, but rather take a supporting role by making the design process effective, efficient, and lean through the coordination of tasks and information.[6] It supposes that a well-managed process would deliver a high-quality product. Supporters of this approach have developed many methods and tools to make individual and collaborative design processes more effective.[7] They "manage" by analyzing, identifying, mapping, and arranging various design tasks in sequential or concurrent orders.[8] The design process is considered a complex system to be broken down into development phases, units of work, and product components.[9] During the process, the management also handles the large amount of design information that must be precisely controlled, stored, presented, and distributed.[10]

This approach also is weak because there is no guarantee that, if the process is well managed, the results will be excellent. Moreover, in practice, the design process is very dynamic, and not all work can be identified as an entity of task to be systematically linked. This mechanical approach is more suitable for engineering design and production processes in which efficiency has the highest priority. The studies for describing and modeling the design process are very useful for theoretical understanding. However, in architecture, most design projects are one-off. Every building project is unique, and thus less suitable for a generic methodology.

5   K. London, "Design Management Model for Performance-Based Briefing," *Proceedings of CIB W60 and W96 Joint Conference* (Hong Kong: May 6–8, 2002).

6   L. Koskela, G. Ballard, and V. P. Tanhuanpaa, "Towards Lean Design Management," *Proceedings of International Group for Lean Construction Conference* (Gold Coast, Ghana, 1997).

7   G. Friedl, M. Henk, G. J. Trum, and P. G. S. Rutten, "Modeling the Design Process: A Process Choreography," *Proceedings of the Joint CIB W096 and Design Research Society Conference* (Reading, UK: September 14–15, 2001).

8   S. A. Austin, A. N. Baldwin, B. Li, and P. Waskett, "Analytical Design Planning Technique: A Dependency Matrix Tool to Schedule Building Design Process," *Construction Management and Economics* 18 (2000).

9   C. Gray and W. Hughes, *Building Design Management* (Oxford: Butterworth-Heinemann, 2001).

10 A. Koutamanis, "Management of Digital Design Information: A Bottom-Up Approach," *Proceedings of the Joint CIB W096 and Design Research Society Conference* (Reading, UK: September 14–15, 2001).

Managing the organization currently is understood as the management of a design office and the coordination of inter-organizational decision-making. A design office can be seen as a "production line," where the demand from the market (client order) is acquired, the requirements are analyzed, the job is assigned to qualified personnel, and the design ideas, drawings, prototypes, and models are developed.[11] In a design office, usually there are two types of managers: the chief designer and the office manager. The chief designer is responsible for the reputation of the office, and he/she is in charge of the projects. The office manager—who usually is known as the one exercising design management—runs the organization, directs the "design production line," leads the office and project administration, and supervises the contractual relationships with other parties. In the case of inter-organizational decision-making, management relies on optimization techniques to make a decision out of conflicting goals from different organizations.[12] This approach has been extended into the design decision support system, which is based on mathematical programming, system thinking, and artificial intelligence.

The weakness of this approach is its limited relevance as corporate management or business administration for design firms. It is not directly involved in the activities of designing. It also relies too much on rational judgment. In actual practice, mathematical optimization for decision-making cannot always cope with uncertainty, multidimensional complexity, and flexible compromises. This is the reason why successful managers are those who are not only highly intelligent, but who also are able to effectively use professional skills, experience, and intuition for communication and negotiation with the other parties.

Generally, there are three barriers for the success of design management research and practice. The first barrier is the fact that design management concept—especially in architecture—is new, and the current research effort is greatly fragmented. Each study focuses on a specific issue of design and elaborates on a specific approach to manage it. Since the real design practice cannot be broken down into small areas to be managed separately, an integrated and coherent design management framework is needed.

The second barrier is that, although the existing approaches sound strong as theoretical concepts, they actually lack a solid scientific foundation. Those concepts also are very difficult to translate and be used by practitioners to handle the day-to-day situations encountered in a real project. In architecture, an innovative study for new scientific development often faces the opposing argument that design management is no more than a variant of project or construction management in the design phase.

The third barrier, which is the most important of all, is the fact that no existing approach can penetrate the core of designing, which is how designers work through creative processes to generate

11 G. Tunstall, *Managing the Building Design Process* (Oxford: Butterworth-Heinemann, 2000).

12 P. P. van Loon, *Inter-Organizational Design* (Ph.D. thesis: Delft University of Technology, 1998).

design solutions. It is remarkable that almost all popular concepts about design management have been established by people who do not personally design anything (e.g., managers, engineers, and scientists). Perhaps because of this, the approach often confronts the essence of designing and makes many designers reluctant to accept design management.

What's Next?

The only way to progress with design management—both as science and as a practical application—is by breaking through those barriers. For this purpose, we will go into an in-depth theoretical investigation to find the interface between designing and managing. This is a crucial step towards the establishment of a new, coherent framework.

On the highest abstraction level, the third barrier must be broken by extracting the essence of design and management, and seeking the shared nature, or in other words, the philosophical common ground on which we can build a new body-of-knowledge. If design and management have a shared nature, it can be assumed that they also have the same root in science. The second barrier must be broken by bringing design management into a certain field of fundamental science with relevant schools of thinking and theories.

Breaking through the third and the second barriers will direct us to discover the interface between design and management, which is the aim of this paper. This interface will join design and management in, first, a common term of reference and, second, a joint scientific paradigm. This will open the gate for developing a new coherent framework to resolve the fragmentation, which means breaking through the first barrier.

Proposition on Term of Reference

Until now, people in the building industry often perceive that design and management stand on two poles apart. Allinson begins his book by illustrating this common misunderstanding.[13] Many designers assume that management is dominated by strictly formulated techniques, methods, and instruments of thinking; and thus hardly compatible with the open, free, and holistic ways through which design handles the uncountable amount of variables. Its roots are in forms of technical rationality, in systems theory, and analytical technique. Its paradigm is the sophisticated mechanical control device, and its twin gods are economy and effectiveness. Conversely, many managers assume that design has an irreducible core concerned with issues outside the boundaries of instrumentality. Its agenda is cultural and aesthetic. Its values are poorly understood, its methods difficult to explain, and thus design is considered a "wild card" in the project management pack.

13 K. Allinson, *Getting There by Design: An Architect's Guide to Design and Project Management* (Oxford: Architectural Press, 1997).

Allinson challenges this misperception. He works from an architect's viewpoint to reveal that there is much common ground between design and management. His argument is quite successful in persuading architects to see that management is interesting and relevant for design. Unfortunately, even if all designers had become more familiar with management subjects, a substantial problem remains. The existing project management techniques have been proven to be inadequate for managing the complexities of contemporary design. Therefore, initiating an awareness among the designers of the importance of management subsequently must be followed by a theoretical research to bring management closer to design, to introduce a joint paradigm to be widely accepted by designers and managers, and to build a new design management framework on that common ground.

The first step into the theoretical research is the reexploration of the essence of design and management by looking comprehensively and deeply at both domains through new perspectives. If there were a universal and complete definition of design and management, our endeavor would have been much easier but, unfortunately, such a definition does not exist. Lawson states that an attempt to define design might lead either to a narrow and restricted view from a particular design discipline, or to a too general and abstract definition which is not very useful in helping us to understand design.[14] He writes that we probably will never really find a single satisfactory definition, but the searching itself is more important than the finding. Similarly, Drucker explains that management has no existence in itself, but is an organ dependent to the institution.[15] The question "What is management?" comes second after we can define management in and through its tasks. For that reason, this paper does not intend to present new definitions, but rather to obtain a reliable term of reference, which is valid for design as well as for management according to the current purpose and context. The underlying purpose is to prove that design can be naturally managed and, respectively, management can be well suited in design. The context is design practice in complex, collaborative projects.

The basic philosophical description of design as stated by Simon and Jones can be accepted by all designers since this applies to what they do.[16, 17, 18] This paper borrows their statements to examine whether management can fit into the same description. The hypothesis sounds as:

> Management resembles design because it, too, is the process by which we devise courses of action aimed at changing existing situations into preferred ones; or in other words, the process by which we initiate change in man-made things.

If this hypothesis is true, then it will become the meeting point between the two domains. Within this hypothesis are three main

14   B. Lawson, *How Designers Think: The Design Process Demystified* (Oxford: Butterworth-Architecture, 1990).

15   P. F. Drucker, *Management* (Oxford: Butterworth-Heinemann, 1974).

16   Herbert A. Simon, *The Sciences of the Artificial* (Cambridge: MIT Press, 1969).

17   J. C. Jones, *Design Methods: Seeds of Human Future* (New York: John Wiley, 1970).

18   Lawson, *How Designers Think.*

properties through which the essence of design and management can be examined: the actor, the action, and the setting.

By the setting, it is presumed that both design and management are situation-attached. In architecture, for instance, it can be seen that design—in contrary to pure art which is centered at the artist—holds the main responsibility for a real contribution to the environment. At the outset, architecture seems to deal with the physical environment only, but actually this will affect the social environment when it fulfils the human needs for space and aesthetics. Management, too, cannot restrict itself from the environment. Management's environment is the society, the organization, and the business enterprise. At the outset, management seems to deal with the social environment only, but actually this will affect the physical environment as it organizes people to decide on accommodation, mobility, facility, and equipment.

Both design and management are associated with the human environment, and are united in the mission to improve the quality of life by "satisfying" physical and social needs through the environment. Thus, the environment is not only the context, but also the object. As the object, it is not the existing environment that is the final destination of design and management, but rather the built one—the man-made one. The goal is not to understand the existing environment for the knowledge collection, but rather to find a way to change it into a more desirable one. In architectural design, the intervention is intended to develop better space (comfortable, healthy, safe, etc.) while, in management, it is to develop better people (motivated, self-esteemed, productive, etc.).

The environment, or the situation, that design and management deal with is definitely not an isolated one—like that of a laboratory or an art studio—which can be fully controlled. Either it is physical or social, the situation is severely influenced by external forces, making it full of unpredictability. Not only is the existing situation uncertain, but so is the targeted one, since it is very dependent on people's continuously changing preferences. This is one of the shared natures of design and management: working *with*—and *within*—uncertain situations.

By the action, design and management can stand on the same line if they are interpreted as verbs rather than as nouns. This means that the focus should not be on the drawings, models, rules, procedures, schemes, plans, or anything which is observed only as an object. Instead, design and management primarily must be considered as activity or practice. Drucker explains that, even though the components of management can be analyzed and organized systematically, the ultimate value of management is in its practice that leads to achievements. The distinctive criterion and the organizing principle of management is not its power to command over people and the work of other people, but rather its responsibility for contribution as an active function.

Design and management as activities occur in a certain process which, at the first sight, seems to be a process of change: changing the existing situations into the preferred ones. However, the process does not simply mean a shift between two existences, but rather a transformation from the existing reality into a new one that does not yet exist. Or in other words, from the present state to the future state that must be created and shaped. Therefore, design and management are more than just "the changing," but also "the making." In order to do this, design and management activities need specific knowledge to recognize the present situation, the expectation, and the transformation. They are knowledge-intensive activities that occur in a set of creation processes.

The process is not a ready-made system to run, but first it must be initiated and devised. Referring to Simon's vision, Boland explains this by saying that management begins with the activity that alerts us to the need for intervention in order to change the current state of affairs. It includes sensing and predicting the conditions that require action.[19] Following the initiation, there are goals, courses, and alternatives to be selected and followed. It now becomes clear that both design and management—in contrast to some kind of art—are not spontaneous and expressive, but purposive actions.[20] Thus, it can be said that design and management are creative activities with accountable goals and knowledge about ways to achieve these goals through a deliberately initiated process.

By the actor, design and management resemble each other since their fundamental principles can only be practiced by human beings. Management cannot be taken apart from the manager. Although what a manager has to be able to do can be learned, the vision, the dedication, the experience, the personal integrity, and the character of managers determine their success. People manage, rather than "forces" or "facts." Every achievement or failure of management is that of the manager. Design, too, is very much attached to the designer. A design firm is appreciated because of the qualification and the reputation of the designer. Design embraces the combination of four personal competences: implementational, improvisional, creative, and intellectual. Design takes a highly complex and sophisticated skill, which is very difficult to entirely replace with "machines." Even if it were possible to develop a "machine" with any of those competences, only human beings can sense and proportionally balance the competences for endless, incomparable cases.

In relation to the actor, it has to be realized that the target and the resource of design and management also are human beings. Design and management originally depart from the people's needs. In architecture, design is needed to provide shelter for mankind, which depends on three basic aspects: the fitness, the form, and the structure.[21] Management is needed to hold the society of organizations together and to make them work. In practice, design and

19   D. Boland, "Design in the Punctuation of Management Action," *Managing as Designing Workshop* (Cleveland: June 14–15, 2002).

20   Allinson, *Getting There by Design*.

21   Virtruvius, translated by D. Rowland and T. N. Howe, *Ten Books on Architecture* (Cambridge: Cambridge University Press, 1999).

management work with people in order to develop something for them, or to develop them. Moreover, design and management involve interpersonal relationships. Professional designers earn their living by designing for others, and often work in teams, hammering out rather than easily conceiving their ideas. In the same way, managers have to integrate "downwards" with their subordinates, as well as "sideways" with people in other areas and functions who have to put their work to use.

It can be said that design and management are centered at the human being as the performer (the leading role), the resource (the main contributor), and the ultimate goal (the final destination). Buchanan's description of design also can apply to management, and it can summarize the discussion so far. He describes that design is the human power of conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes. "Power" is the efficient cause or agency of action that concerns creativity. "Conceiving, planning, and making" are activities executed with adequate knowledge and careful consideration. "Product" represents the changed environment, which can either be physical or social.[22]

Thus, the hypothesis at the beginning of this section can be confirmed as legitimate. Based on it, a proposition on a joint term of reference is constructed. It acknowledges design and management as: "Knowledge-intensive human activity, which works with and within uncertain situations, to deliberately initiate and devise a creative process for shaping a more desirable reality."

The new term of reference underpins the common ground between design and management. It is the bottom line of the interface between the two domains. It provides a way to connect a wide array of people's interpretations about the essence of design and management that forms the core of a coherent design management framework.

Proposition on Scientific Paradigm

The second part of the interface between design and management is a joint scientific paradigm. Kuhn describes a paradigm as a collection of beliefs shared by scientists, a set of agreements about how problems are to be understood.[23] A paradigm is essential because it guides the research efforts of scientific communities, and it is the criterion that most clearly identifies a field as a science. Kuhn envisions a science as having, at any one time, a paradigm or "worldview" of its environment. This scientific paradigm describes everything that the science holds—all of its laws, beliefs, procedures, methods, and everything upon which it bases its life. By his description, a paradigm is the set of inherited preconceptions, the "glass darkly" through which even the most scrupulous inquirer habitually views the world. When someone shatters the glass—as Einstein did with

22 Richard Buchanan, "Design Research and the New Learning," *Design Issues* 17:4 (Autumn, 2001).

23 T. S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: Chicago University Press, 1962).

his theory of relativity, for instance—everyone is forced to ask questions differently, and to view the challenges of science and philosophy in a new way. This is known as a paradigm shift.

Finding a scientific paradigm for design and management involves facing an opposition that says that neither design nor management is rock-hard science. One the one hand, design and management often are questioned in terms of their legitimacy in being sufficiently fundamental as fields of science. Many concepts are based on personal success stories of the gurus, who invent the ideas, travel around, and gather a group of followers. Theoretical models are not empirically validated, while terminologies often appear weak against the critics of rules and formal logics. On the other hand, the attempt to define design and management as autonomous art or science can lead it to isolation.

Through the assessment by De Jong and Van Der Voordt, we can see that design cannot fully comply with the general criteria for scientific activity such as reliability, validity, and evaluative potential.[24] To comply with reliability, design must demonstrate consistent behaviors under circumstances that are determined beforehand. Regarding this characteristic, the reliability of design is restricted due to the fact that there is a range of possibilities to use a design product, and there is much freedom to choose between them. To comply with validity and evaluative potential, the design must be able to be generalized in different situations or contexts. In fact, design thinking is less focused on causality for generalization reasons, but more on conditionality since designers are hired particularly for solving problems in a unique way. For this reason, the classic empirical science, which strives towards design that can be generalized, may be frustrated. This has become even more complicated since design features elements which are incomparable with each other, such as usefulness, beauty, and sturdiness. The way design unifies these elements within a specific context is difficult to evaluate before a product is made and used. In architecture, even if a building as a design product proves its value this way, this does not ensure that the same way of designing will generate to the same results somewhere else.

Drucker says that believing that management can ever fully be a science could be harmful. Management is a practice rather than a science, although it contains elements of both. There are aspects and requirements that can be analyzed, organized systematically, and learned by anyone with normal intelligence. This stresses that management is not just a matter of experience, hunch, intuition, or native ability. And yet, achievement, rather than knowledge, is both the aim and the proof. Moreover, management as well as design—unlike "hard" science—are not value-free.

Having learned these opinions, it probably is questionable whether a scientific paradigm for design and management ever will be found. However, in the "scientific assessment" above, people

24 T. M. De Jong and D. J. M. Van Der Voordt, eds., *Ways to Study and Research* (Delft: DUP Science, 2002).

usually use the characteristics of natural or engineering sciences as starting points. The word "applied sciences" conceals but does not change the fact. It simply means that, in the professional schools, those topics are selected from mathematics and natural sciences for emphasis that are thought to be most nearly relevant to professional practice.[25]

It may appear that design and management do not completely belong to these natural or empirical sciences, but this does not mean that they are non-science. There is another kind of science, which Herbert Simon called "the sciences of the artificial." The term of reference generated in the last section also reflects the association between design and management with this kind of science. "Artificial" is used here in a very specific sense: to denote systems that have a given form and behavior only because they adapt (or are adapted), in reference to goals or purposes, to their environment. Simon characterizes an artificial system as an interface between two aspects (for example, a person and a building). These aspects lie in the province of natural science (a biological man/woman and a physical space/material), but the interface that links them is the realm of artificial science (the way an architect designs a building; the way an inhabitant lives in the building). Simon indicates how the sciences of the artificial are relevant to architecture, management, and to all fields that create designs to perform tasks or to fulfill goals and functions.

Simon describes how both man-made artifacts and man himself, in terms of this behavior, are artificial. He continues by saying that the complexity in human behavior is largely a reflection of the complexity of the environment in which he finds himself. The analysis in this paper fleshes out these abstract connections by emphasizing that design and management are activities by—and through—which human beings intervene in the environment. Within this understanding, the aspect of human behavior manifests itself in the social process within—and between—the individuals involved in designing or managing.

The nature of design as a social process has been explored by Bucciarelli.[26] He examines the consequences of the fact that design is both an instrumental process and an activity that always takes place in a social context. He compares design with language, as a human construction embedded in and co-terminus with a range of social activities. Design is a process which engages individuals, each with different ways of seeing the subject, but yet individuals who in collaboration, one with another, must work together to create, imagine, conjecture, propose, deduce, analyze, test, and develop a new product in accord with certain requirements and goals.

Management, too, is very much dominated by social process. Management is a social function, embedded in a tradition of values, customs, and beliefs, and in governmental and political systems.

25 Simon, *The Sciences of the Artificial.*
26 L. L. Bucciarelli, *Engineering Philosophy* (Delft: Delft University Press, 2003).

Management is culture-conditioned and, in turn, management and managers shape culture and society. Even though the management function, the work of management, its tasks, and its dimensions are universal and do not vary from country to country, the way the work is done is strongly influenced by national traits, national traditions, and national history, and sometimes determined by them. Thus, although management is an organized body of knowledge and, as such, applicable everywhere, it also is "culture."[27]

The evidence that design and management are intensely social processes enclosed in the sciences of the artificial has guided the search for a joint scientific paradigm towards social science. The next query is to determine which theories of social science can be used as the basis for developing a coherent design management framework.

Bucciarelli claims that design comprises two main aspects in balance. The first one involves the analysis of situation and the creation of design artifacts. The second one involves the purposes and roles in social circumstances. This is crucial because what **complicates** the situation and makes designing a challenge of the highest order is the fact that each participant sees the object of design differently. Bucciarelli says that design and many of the descriptions in the process of design are expressions in the various languages of "object worlds." This is aligned with what Buchanan calls "interaction design" that focuses on how human beings relate to other human beings through the mediating influence of products. Here, products are not only physical objects, but also experiences, activities, or services.[28]

Management, too, must balance two kinds of abilities in undertaking its main tasks. One involves the analytical and synthesizing ability, including human perception and insight; and the other involves integrity and the ability to interact with other people. The first ability is more dominant in tasks related to measuring, while the second one in tasks related to communicating, motivating, and developing people. Both abilities are equally important when management must set objectives and organize.

It is now clear that design and management as social sciences are nested in inseparable aspects of being *cognitive* and *interactive* at the same time. With respect to the cognitive aspect, design and management can refer to theories of cognitive psychology, especially those related to innovative and creative thinking. These theories explain how comprehension and creation go together in a knowledge activity by a human being, which is known as cognition. They include perception, learning, problem framing, idea generation, and decision making in an iterative circle of thinking and action using explicit and tacit knowledge.[29] With respect to the interactive aspect, design and management can refer to organizational theories about group dynamics.[30] These theories cover issues such as the synergic

27 Drucker, *Management.*
28 Buchanan, "Design Research and the New Learning."
29 M. Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (London: Routledge-Kegan, 1958).
30 H. D. Hohn, *Playing, Leadership, and Team Development in Innovative Teams* (Ph.D. thesis: Delft University of Technology, 1999).

interaction between individuals and between organizations, the behavior and conducive atmosphere of working groups, organizational culture, value, leadership, and governance, and organizing for performance.

Having searched for a joint scientific paradigm, this paper suggests that any attempt to develop design management on a firm scientific foundation should focus on managing the creative cognition through the dynamics of a design team.

Conclusion

This paper discusses a theoretical research to respond to the need for an innovative management of design. The existing management approach has failed to deliver satisfactory results, since it relies on weak scientific references and uses the top-down approach to apply project management instruments in design. The evidence shows that many of these instruments are in conflict with the essence of designing. To build a new, coherent design management framework, a common ground must first be established. The common ground is an interface between design and management that enables a new constructive perception to integrate these two domains. The interface consists of a joint term of reference and a joint scientific paradigm. Its early impact is achieved by guiding the managers to learn from particular design competences that are useful for handling complex tasks, and getting the designers to realize the significant role of management in improving design work.

In an attempt to recognize the essence of design and management, this paper draws upon some aspects of the work of Vitruvius, Drucker, Simon, Jones, Kuhn, Bucciarelli, Lawson, and Buchanan. As summarized by Dorst, there are two main paradigms of design: the one that sees design as a rational problem-solving process related to engineering sciences; and the other that describes design as an activity involving reflective practice related to the social sciences.[31] This paper assesses which paradigm is the most appropriate for the purpose of managing design.

The new phenomenon in real-world practice shows that social complexities in design have been escalating on top of the technical ones. While new technological inventions can solve almost any technical difficulty, a new demand has arisen for the socio-psychological approach to manage socially complex design collaboration. The same phenomenon also appears in the academic world, since there is an early tendency to shift from the technical-rationality to the social-psychology. In science philosophy, we can notice the "evolution" from systematic thinking to social-reflective paradigm. There is a revival of the human factor, with its unique cognitive facilities, as the focal point in design and management. Buchanan illustrates this as a fundamental shift in the intellectual arts that we employ to explore design in practice and research. The early theories of design found

31 C. H. Dorst, *Describing Design: A Comparison of Paradigms* (Ph.D. thesis: Delft University of Technology, 1997).

expression in the grammars and logics of design thinking, but new design finds expression in rhetoric and the dialectic.[32]

This paper promotes new perspectives from the cognitive sciences—which were once a matter of philosophical speculation—to become central to the science of design management. Design management through a socio-psychological approach has great potential, since it raises the sensitivity of designers to complex societal realities during and after the design process. It also contributes to creating better design through creative and reflective collaboration, progressive learning-in-action, and high-performance teamwork.

Recommendation for a New Framework

The logical follow-up for this interface will be research to develop a coherent framework for design management. Coherent means that the new framework must be consistent, understandable, and cohesive. In this sense, the framework must steadily integrate various aspects without contradiction, have clarity and intelligibility to be widely accepted on different levels, and be eligible as a plan for action. The framework must allow design and management to maintain their own "identities" but, at the same time, transform and improve both domains in practice through the shared nature, mutual dependency, and positive integration between them. The implementation of the framework is expected to equip professional designers and managers with a new way of thinking that will encourage them to employ innovative approaches to improve design and management practice.

Using the interface introduced in this paper as the underpinning, the framework will operate on the cognitive and interactive characters of design management.[33] There are indications that the reflective workshop could become a relevant instrument in which innovative thinking and group dynamics are optimized through design collaboration. The workshop also will provide opportunities for individual and group reflections.[34, 35] While maintaining that design management is central to managing the human creative competences in collective designing, other management elements must not be neglected. At the outset, design management must be able to link to the integral management and coordination of the project.

Since the framework is aimed at practical implementation, its concept needs to be verified by practicing designers, managers, and stakeholder representatives. Respectively, the framework should be validated through a number of actual case studies in empirical research. In order to incorporate the new paradigm of design management, which is oriented to the social sciences, a specific methodology for empirical research must be prepared. The road towards the realization of the new design management breakthrough in practice is long, yet this paper wishes to contribute by laying down the conceptual platform for further studies.

32 Buchanan, "Design Research and the New Learning."

33 R. Sebastian, H. de Jonge, M. Prins, and J. Vercouteren, "Managing-by-Designing: Management for Conceptual Design Phase of Multi-Architect Projects" in F. A. Duijn and L. H. M .J. Lousberg, eds., *Handbook of Building Project Management* (The Hague: Ten Hagen Stam [in Dutch], 2003).

34 Donald A. Schön, *The Reflective Practitioners: How Professionals Think in Action* (Aldershot, UK: Avebury, 1983).

35 A. C. Valkenburg, *The Reflective Practice in Product Design Teams* (Ph.D. thesis: Delft University of Technology, 2000).