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VISUAL FIELD THEORY

Nature and Composition in Twentieth-Century Boston

IF ENVIRONMENTAL AESTHETICS aspires to meet the demands of both environmental activism and aesthetics, it must contend with the history of composition—that is, of compositional conventions as they have unfolded since the Romantic period and as they have entailed abstract ideas of nature, anxiety, alienation, and human agency. Composition might seem remote from the questions of environmental health or picturesque value associated with mainstream environmental aesthetics. Yet problems of a compositional nature—how we understand the arrangement of elements in an image, how we assign value and meaning to those elements, and how we develop from these observations a set of rules to guide future arrangements—are integral to the systemic perspective of contemporary ecological art and design. In fact, the postwar flowering of environmental consciousness that I described in the introduction was concurrent with a renewed interest in composition among designers as a framework for understanding, representing, and modulating natural order.

While many scholars of environmental aesthetics, most famously Ronald Hepburn in his 1966 essay "The Neglect of Natural Beauty,"

have described a lamentable absence of nature in the compositional treatises of the nineteenth and twentieth centuries, I argue that, on the contrary, the theories of composition that emerged in postwar America were already thoroughly entwined with theories of nature understood in terms of space, time, and material rather than the judgment of scenic vistas. This is especially apparent in the writing of émigré artists steeped in the biocentric worldview of German and Hungarian intellectual circles. They brought to postwar Boston a new set of visual and environmental metaphors and contributed to an ongoing conversation around design education in the city. This chapter is devoted to one recurrent metaphor of the period: the electromagnetic field as a corollary to the visual one. This metaphor displaced the musical metaphors that had dominated compositional thought in the period preceding World War I and played into a preexisting desire by local art theoreticians to merge recent scientific discoveries with new epistemologies of the visual world. This mode of compositional inquiry, which I refer to in this book as "scientific formalism," unfolded alongside the better-documented history of medium-specific formalism narrated by Clement Greenberg. Where Greenberg's study of modernist composition foregrounded painterly problems, scientific formalism focused on the representational problems endemic to indexical mediums like photography, while generalizing photogrammic mimesis to all forms of visual representation, whether indexical or not. This claim builds on the research of James Nisbet and Douglas Kahn, among others, who have elaborated on the power of the energetic systems in the environmental imagination of the postwar period. This chapter localizes the discourse of energetic exchange to Cambridge, Massachusetts, and pictures it as an outgrowth of turn-of-the-century arts appreciation as it contacted the European tradition of Naturphilosophie.

FROM COMPOSITION TO PLASTIC ORGANIZATION

Compositional studies in the first half of the twentieth century organized itself around two poles represented here by two pedagogues: the American artist Arthur Wesley Dow and the Hungarian artist György Kepes, both of whom were influential art educators in the Boston area, Dow at the turn of the century and Kepes at midcentury, and each of whom published the most influential art manual of their time. The dominance of these two voices as pendants to American art education is apparent from the frontispiece illustration to Frederick Logan's 1955 survey *The Growth of Art in American Schools,* which took stock of developments in American art education. His book begins with a side-by-side comparison of two pedagogical exercises (figure 5): on the left, a series of three variations on a landscape composed using Dow's tonal principle of Notan, a Japanese aesthetic concept elaborated in his primer *Composition* (1899), and on the right, a series of illustrations from Kepes's well-known manual *The Language of Vision* (1944). The optical illusions in the latter use Gestalt principles to distort the relative size and directionality of abstract elements like lines and circles. Logan's comparison suggests a hardening, through contact with physiological psychology, of Dow's compositional system. And yet this connection to physiology and to science was ironic, given that Dow was deeply indebted to the Ruskinian point of view that

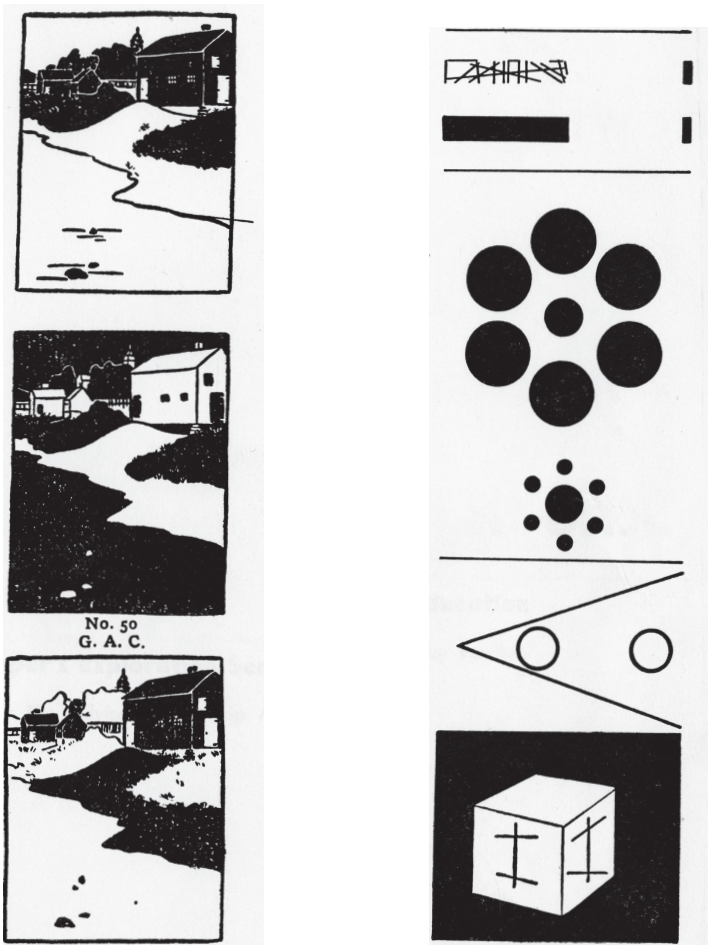

FIGURE 5
Frederick M. Logan, frontispiece to *Growth of Art in American Schools,* 1955. Published by HarperCollins, New York. Visual Illusion of Size and Direction (From Gyorgy Kepes, "language of Vision," Paul Theobald, 1944.) Notan Landscape Composition into Two Tones. (From A. W. Dow, "Composition," J. M. Bowles, 1899.)

rejected the empirical observation of nature in favor of intuitive decision-making and that took beauty and pleasure to be the twin aims of art. But how, exactly, did Americans get from one compositional system to the other?

In *Language of Vision,* Kepes put forward an influential scientific formalist theory of composition for his American readers. Building on his claim that the work of art was fundamentally a device for communication, the book argued that vision had a structure and purpose akin to language. Much has been written about the debt Kepes owed to the fields of semiotics and structuralism. However, it is clear that Kepes believed in certain physical-perceptual conditions that existed prior to the image's entry into language. "Before one begins to use visual language for the communication of a concrete message," Kepes warned, "he should learn the greatest possible variety of spatial sensations inherent in the relationships of the forces acting on the picture-surface."[1] Unlike written or spoken language, visual language requires a natural education in the set of forces that permeates the visual field of

the image and that functions analogously to real fields of energy. Leaning on the Gestalt psychology of Max Wertheimer, Kurt Koffka, and Wolfgang Köhler, all of whom he thanked in the book's acknowledgments, Kepes spun a theory of visual organization that relied heavily on the idea of the "picture-surface" as a "field." The book presented all compositional relationships with that field as "forces," whether internal to the picture plane or influencing it from outside. The notion of visual force connected visual composition to other kinds of energetic systems; each visual element stood in motivated relation to other elements, locked into place by the counterforce of its environment. While the field image had, until the advent of structural linguistics in the 1910s, been foreign to studies of linguistic communication, the instantaneous character of vision lent itself to such synchronic study, and so the image of field seemed to describe not a subjective mode of analysis but a natural fact of vision and therefore of visual design.

The Gestalt psychologists had taken a similarly analogic approach to vision, drawing comparisons to the mechanics of the electromagnetic field. Kurt Koffka, for example, stated simply that "things look as they do because of the field organization to which the proximal stimulus distribution gives rise."[2] The resemblance of Gestalt psychology to field theory in physics is hardly accidental; the Gestalt psychologists were well acquainted with classical field theory as well new findings in what they considered to be a sister science, quantum mechanics. Köhler, Koffka, and Wertheimer were inspired by the idea that interacting elements could combine to create an overall pattern of force, theorizing that emergent patterns of energy within a visual arrangement produced an analogous pattern of energy within the brain, though altered to increase the perceived stability of the image. In 1959 Wolfgang Köhler explained the methodological relationship between physics and Gestalt for an American audience:

> To be sure, our reasoning in physics involved no changes in the laws of physics and no new assumptions in this field. Nevertheless, when we compared our psychological findings with the behavior of certain physical systems, some parts of natural science began to look different. . . . Max Planck once told me that he expected our approach to clarify a difficult issue which had just arisen in quantum physics if not the concept of the quantum itself. Several years later, Max Born, the great physicist who gave quantum mechanics its present form, made almost the same statement in one of his papers. And, only a few weeks ago, I read a paper in which Bridgman of Harvard interprets Heisenberg's famous principle in such terms that I am tempted to call him, Bridgman, a Gestalt physicist.[3]

I have called this chapter "Visual Field Theory" because midcentury texts like *Language of Vision* that searched for compositional principles grounded in the logic of the visual field were rooted in the same aspirations as field theory in the physical sciences, that desire for a universal theory of interactions that might be described by a single common representation, or what the poet Jorie Graham has called "the dream of the unified field." Such endeavors are part of a well-documented modernist dream of universality, which generated many totalizing theories, and yet the desire by Kepes and others to create a universal visual field

theory went beyond mere metaphor. These thinkers understood that the relationships they attempted to map had immediate material reality and that compositional decisions had immediate material consequences as well. That visual composition might have any consequences at all moved it from the realm of imagination and personal expression to the realm of governed relations embodied by the practical arts of design and planning.

After World War II, art manuals were geared toward formal problems, rather than, say, problems of material handling or accurate rendering. In the late 1940s, just when Pollock's discovery of "all-over" composition displaced the traditional relational composition of prewar painting,[4] a spate of books published by a displaced European avant-garde were making the case for the social and environmental importance of relational composition. In 1944, Kepes published *Language of Vision* with Paul Theobald Publishers, which in 1947 also released Moholy-Nagy's *Vision in Motion,* the follow-up to *The New Vision,* which was reprinted in 1946. These texts would lay the ground work for the Gestalt-derived design theory of Rudolf Arnheim (*Art and Visual Perception,*1954) and Donis Dondis (*A Primer of Visual Literacy,* 1973), as well as the publication of manuals on line-rendering and color theory from former Bauhaus faculty Paul Klee (*Pedagogical Sketchbook,* 1953), Joseph Albers (*Interaction of Color,* 1963), and Johannes Itten (*Art of Color,* 1961).

Kepes's book would become one of the most widely read manuals in American art education. At least according to Logan, Kepes was "the strongest American voice of the Bauhaus transplants in American schools. His *Language of Vision* has become a text in dozens of art schools and is easily the most influential single volume on art education in the 1940s and early 1950s. . . . Kepes takes his place as one of the foremost spokesmen for the kind of education the Bauhaus initiated in 1919."[5] *Language of Vision* was reprinted twelve times between 1944 and 1967 and can be found in over eleven hundred academic libraries, with many more in public libraries and high schools. While its current ubiquity is close to that of Moholy's *Vision in Motion,* the latter text did not have a large print run until 1969, leaving Kepes's slender book to dominate art classrooms in the intervening years. Its success was largely due not only to Kepes's vocal presence as an art pedagogue but also to the book's structure, which was much more amenable to American art classrooms than was *Vision in Motion.* At nearly four hundred pages, Moholy's book stood somewhere between a treatise, a mission statement for the Chicago Bauhaus, and a history of modern art. *Language of Vision* was comparatively short, visually exciting, and proceeded methodically through the premises of Gestalt psychology and visual design. The book was organized around foundational concepts—such as optical sequencing (or rhythm), relationships of size and location, and linear perspective—and Kepes illustrated these with examples from many art historical periods, cultures, and mediums that demonstrated both the timelessness and utility of his organizational principles. The book does not contain the sort of exercises one might expect from a manual, yet its insistence on visual comparison and pattern formation lent itself to classroom application and to use by an aspirational class of lay readers looking to increase their visual literacy. It doubled as an edifying text for aspirational designers and as a stylish home accessory.

Until the release of Kepes's text, only Arthur Wesley Dow's *Composition* had held similar sway over American art education, though it had served primarily as a teacher's manual, not as a textbook. Kepes's instruction in "plastic organization" differed significantly from the rules of "composition" taught by Dow. Both books rejected the representational naturalism of earlier art manuals that approximated Renaissance empirical drawing techniques, as well as the irrational content of Romantic or surrealist art. Instead, the sharpening of one's organic sensibility was a primary aim of both books; both delivered lessons on pictorial structure and defined formal unity as an organic sense of wholeness. However, Dow's understanding of pictorial unity relied on originating acts of framing and dividing space and was grounded in deliberate compositional "subordination," the idea that each image should be granted a single dominant form that determines character of the whole, with all other pictorial elements subordinate to it. "Unity" he wrote, "is secured through the relation of principal and subordinate, even down to the veinings of leaves a multitude of parts organized into a simple whole. . . . Subordination has all its parts related by delicate adjustments and balance of proportions, tone and color. A change in one member changes the whole."[6] Internal hierarchy, so Dow's argument goes, creates structure and therefore distinguishes the composed image from the arbitrary natural one: "Wholeness is essential to beauty; it distinguishes Music from Noise."[7]

Subordination, though it was never a term Kepes used, was implicit in his energetic interpretation of the visual field, within which asymmetrical powers of attraction or repulsion automatically relegated certain forms to dominant and subordinate positions. Kepes instead used the term *plastic* to describe the concept of pictorial unification. Where *plastic* had conventionally referred to the moldable aspects of a material, its amenability to forming, Kepes explained that his use of *plastic* referred to the integrative process that takes place in vision: "'Plastic,' therefore, is here used to designate the formative quality, the shaping of sensory impressions into unified organic wholes."[8] Where "subordination" was the duty of the artist, this "formative quality" belonged to the image field. Further distinguishing them, Dow defined the artistic act as divisive, partitioning pictorial space demarcated by the edge of page or canvas, whereas Kepes emphasized the integrative role of perception, a likely outcome of his assumption that the pictorial field and its environment were continuous. The pictorial field resembled other environmental systems and was dependent on them.

Despite Dow and Kepes's shared reference to underlying structure and pattern and the importance of wholeness for producing a unified image, there was an important philosophical rift between the two authors. The preestablished diagrammatic compositions that illustrate Dow's text, his grids (or plaids, as they are known), were tools for creating invisible armatures behind the work of art, forms of order that precede and underlie representational and decorative content, compatible with any image projected onto it. Dow adamantly insisted on art's autonomy from nature, and thus from the duty to represent nature. Echoing the aestheticist arguments of J.M. Whistler fifteen years earlier, Dow reasoned that through the command of composition, the vicissitudes of nature, its arbitrariness apparent in the casual forms it created, could be replaced with the consistency of form and structure

in the composed image. Dow's concept of structure was a tool for freeing the mind from nature and history, so that it could imagine new worlds into being. As many compositional theorists noted, this was a freedom already known to music. The section that follows tracks the period between Dow's publication of *Composition* and Kepes's *Language of Vision,* to chart how field thinking emerged out of the turn-of-the-century obsession with music and a desire for a unified scientific theory of visual form. Composition in 1900 offered a way of liberating art from the mindless transcription of the natural world and of historical styles. By 1950, artists no longer desired such freedom from nature, which had become a dangerous side effect of the modern divided self. Instead, the study of composition offered a way of understanding abstract art as simultaneously mimetic and functional. Paired with the study of perception, composition in this latter sense became burdened with task of repairing humanity's fraught relationship to the environment.

APPRECIATION AND THE MUSICAL METAPHOR

Kepes's *Language of Vision* bears the marks of his origins in the art worlds of Budapest, London, and Chicago. Nevertheless, it contributed to an ongoing discourse begun among Boston-area art theorists fifty years earlier. These writers addressed the possibility that composition could function as a vehicle for promoting the public "appreciation" of art, a term which "implied a mental faculty that could be guided and educated" and that bridged the worlds of popular culture and aesthetic philosophy.[9] Dow, along with Denman Ross, A.H. Munsell, and Edith Kettelle had prepared the ground for ideas like Kepes's to thrive. The legacy passed down by this early art education movement had three main components of which scientific formalism would make use. First, the notion of appreciation accepted the teachability of art, even if only as a consumer; second, the increasing collaboration of aesthetics with scientific observation opened the door for Gestalt psychology and a naturalized version of composition to develop; and finally, the regional interest in "pure design" eschewed the study of art historical styles in favor of a synchronic, structural approach to vision. However, in the early decades of the twentieth century these ideas were couched in a musical metaphor that insisted upon the antinaturalistic character of true composition as a way of distancing compositional studies from academic traditions of rote visual transcription.

In 1900, Dow founded the Ipswich Summer School of Art, where he imparted his ideas to young artists and art educators throughout the region. He had developed his theories of composition alongside the Harvard-educated historian Ernest Fenollosa at the Museum of Fine Arts Boston, where they studied Japanese prints as a source for understanding the nature of art in general, rather than as a historical or regional style. When discussing the nonnaturalistic elements of Japanese imagery, Fenollosa frequently deployed Dow's same holistic language paired with analogies to musical theory as a way of getting underneath the cultural specificity of the image to excavate the universal lessons to be found in non-Western art: "Lines and shades and colors may have an harmonic charm of their own, a beauty and infinity of pure visual idea, as absolute as the sound idea in music. The artistic element in form is . . . the pure simple music of a form idea. . . . The fact that such a line organism may

represent natural fact does not interfere with its purely aesthetic relation as line."[10] The two saw the interdependence of all parts of the image, as implied by the unusual phrase "line organism," as the chief characteristic of Japanese composition. In fact, they took that interdependence to be the culmination of Kantian aesthetic purism exemplified by the organic whole and of Hegel's interest in organic form as the highest manifestation of Spirit. Unlike the direct observation of nature, the decorative art of Japan offered to American artists "a sort of imagic surface construct less *given* as a natural fact than provoked, engendered, and articulated by mind and hand."[11]

Their mutual interest in formal problems has been credited with the beginning of "pure design," an American art pedagogical trend that disregarded historical styles in favor of the harmonious interrelation of formal elements and that was developed into a teaching method by Denman Ross at Harvard. Dow's now-famous tartan grids, what he called his "line ideas," evacuated content altogether. Throughout *Composition* one can find preestablished diagrammatic compositions, typically elaborated versions of the grid, the infinite variations of which underscored the role of artistic decision making. These diagrams acted as the balanced structural underpinnings to an image not yet filled in. While resembling modernist pictures, they were not yet pictures of anything. Nature might provide the motifs of Dow's pictures—its lotuses, lakes, and vines—but the task of the designer was to establish an expressive abstract pattern prior to its elaboration with decorative motifs. Composition was built upon the image as structured a priori, one whose correctness was devised and recognized intuitively. Dow's preestablished diagrammatic compositions preceded the emergence of the picture; they created a balanced structure that could support any image projected onto it. Despite their antinaturalism, his line ideas were meant to demonstrate that the aesthetic division of space could conform to an internal logic much like the rules of harmony and rhythm in music.

Employing the musical metaphor common to both Aestheticism and the Art and Crafts movement, Dow defined composition as "the 'putting together' of lines, masses, and colors to make a harmony." He deliberately avoided *design* because that was, he claimed, too commonly understood as decoration. Instead Dow hoped to develop the human faculty of "appreciation" necessary for the "composer to recognize harmony" or "art-structure" latent in a work of art or nature in opposition to the "time-honored approach through imitation—of nature and historic styles." His anti-imitative stance discarded the Renaissance division of art and design, which he claimed had distorted the role of the different media. For example, rather than a "rhythmic harmony of colored spaces, [painting] became sculptural, an imitation of modelling." To restore the link between design and representation meant to prioritize structure over the depiction of empirically observed, but ultimately casual, incidents of nature.

Many of Dow's contemporaries also relied on the musical metaphor. The compositions, variations, improvisations, and harmonies produced during the early years of aesthetic formalism deferred to music as the primary nonrepresentational form of expression for its use of temporal spacing, rhythmic variation, and tone to convey human emotions. Likewise, Fenollosa "believed music to be, in a sense, the key to the other fine arts, since its essence