

Aspects of Structure

BY STEPHEN HOGBIN

Has furniture been influenced—and even dramatically changed—by the cardboard construction of a guitar? In 1912, Pablo Picasso made frail objects from paper and card that investigated the volume of the guitar, broken into planes and reassembled to reveal a new structural awareness. Picasso, the painter, was exploring territory familiar to makers of three-dimensional objects, but with his own particular genius was seeing with a fresh vision the possibilities of constructions. From these experiments emerged Cubism, as objects were reconstructed by transforming their volumes into a series of intersecting planes. On the painter's canvass, the planes appeared almost as a crystalline structure, articulating or appearing to flatten the image into the picture plane. Sculpture followed the inspiration of the painters, and the traditional materials of clay and wax were likewise subjected to planer shapes.

After visiting with Picasso in 1913, Vladimir Tatlin returned to Russia, where he produced the first completely abstract construction. While Picasso's constructions were an extension of two-dimensional space and continued to represent familiar objects, Tatlin conceived of a new type of sculpture with no intention to *represent* reality, but rather to *express* form and materials in space. This period of time was revolutionary in the arts and in science; so, too, were the politics for artists such as Tatlin and the other Russian Constructivists, as they were called. The 1917 revolution created an imperative to work for the broader population rather than for an elite if artists were to stay in that country. Their interest in form and construction remained, but they turned their attention to objects for manufacture, becoming the early (avant-garde) industrial designers of Russia.

More familiar to furnituremakers is the work of Gerrit Reitveld from Holland,



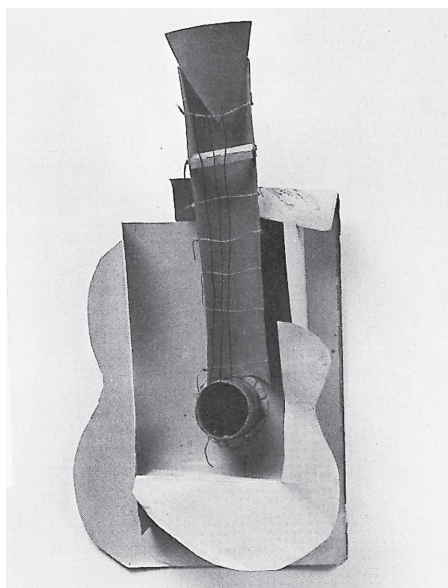
ALL PHOTOS OF CANBERRA WORK COURTESY OF THE ARTISTS

"Pelican Chair," by Matthew Harding of Canberra, Australia, combines meticulous attention to structural integrity with poetic expressiveness.

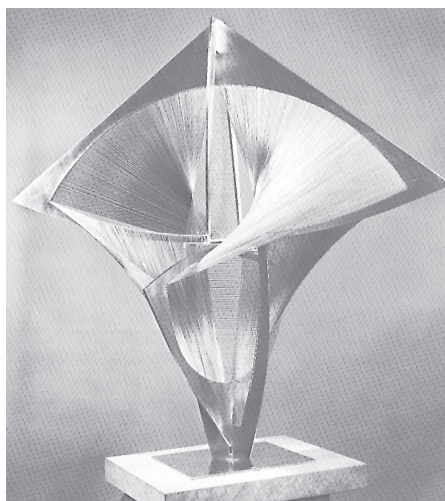
who from a traditional background in cabinetmaking stepped forward in 1918 with the "Red/Blue Chair." With this iconic chair of modern design, the structural elements were expressed as separate parts forming the whole. The fragmenting of the construction presents this new structural aesthetic. Reitveld was also influenced by E.W. Godwin and the Arts-and-Crafts Movement, which reduced ornamentation and looked closely at structure. While architects and industrial designers of early

Modernism pursued new materials such as chrome-plated tubing, the studio crafts produced designer/craftsmen such as Hans Wegner, whose 1949 teak and cane chair ("JH 501") still looks modern today. Similarly, Frank Lloyd Wright, absorbed by architecture in nature, expressed structural elements and a sympathy for materials, resonating with the structural awareness of the times.

Unlike Picasso and other painters working with Cubism, artists such as Tatlin and Reitveld were interested in the application of engineering techniques to plane and space: the structure of inorganic works. Three-dimensional abstraction emerged,



CLOCKWISE FROM FAR LEFT—
Pablo Picasso, "Maquette for Guitar" (1912);
cardboard and string.

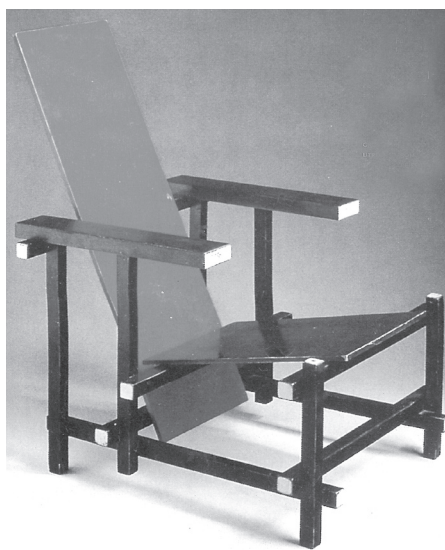
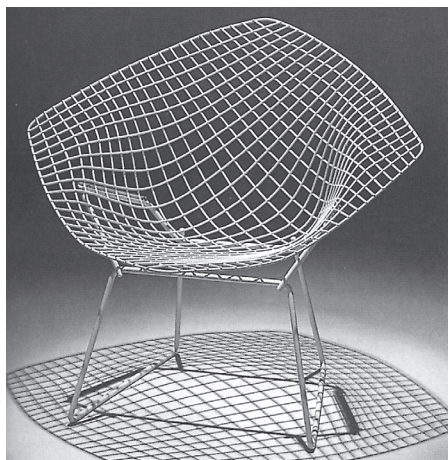


Naum Gabo, "Torsion Variation"
(1963); bronze.

Gerrit Reitveld, "Red/Blue Chair" (1918/1923);
painted beechwood and plywood.

Charles Biederman, "Work #36" (1953/1972);
wood, plastic, aluminum, paint.

E. W. Godwin, "Table with Folding Shelves"
(1872); mahogany, brass.



Harry Bertoina, "Diamond #421LU" (1950-1952);
chrome-plated steel.



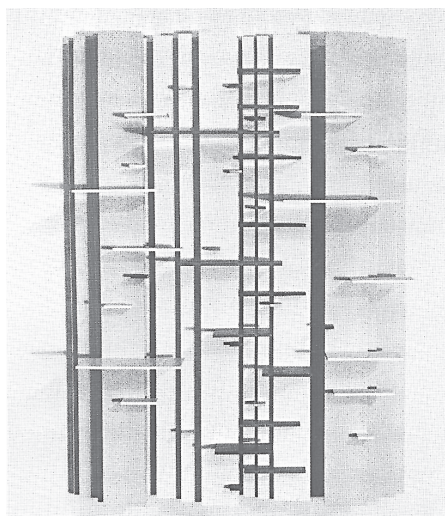
Constructivists) emerges from Picasso's constructed guitar. Tatlin and Gabo moved towards a technological future, but while Tatlin remained in Russia and went to work for the people, Gabo brought his experimental forms to Europe, working for a time with the Bauhaus. A later work by Gabo, "Torsion Variation" (1963), is an example of the structural refinement of his sculpture. In these examples, we can see clearly the separation of the constructed from traditional modeling, carving, and organic forms of representational work. Even so, those traditional sculptures also began to include the tensioned strings of Picasso's vision. Disciplines merged, overlapped, gaining inspiration from one another, and then grew apart again.

Inevitably, though many years after the revolutionary decade 1912–1922, Constructivism evolved to another concept. Charles Biederman, from Red Wing, Minnesota, advanced his ideas of structure in his influential book *Art as the Evolution of Visual Knowledge*. Biederman coined the term "Structurist" in 1952 to express the synthesized qualities of painting, sculpture, and architecture in accordance with structural process in nature. Biederman had several sources of inspiration, and rather than identifying with Cubism and Constructivism, he connects to the work of Paul Cezanne and Piet Mondrian. Cezanne was interested in the structural processes underlying nature, and his colored forms asserted a distinct

derived from these Russian and Dutch models. "Science and art are parallel," comments Herbert Read in *Modern Sculpture*, "the one advancing from empirical observation...the other from intuitive apprehension of the nature of the physical world..."

For these artists the gap narrowed between art, design, craft, and science as each approach overlapped one with the other.

The articulation of planes and the lines of tension in the stringed sculpture of Naum Gabo (another of the Russian



CLOCKWISE FROM NEAR RIGHT—
George Ingham, “Chancellor’s Chair”;
laminated red box (*Eucalyptus polyanthemos*),
sandblasted stainless steel rod.

George Ingham, “See-Through Chairs”;
laminated wenge, woven stainless steel wire trace.

David Upfill-Brown, “Pair of Chairs”;
laminated jarrah (*Eucalyptus marginata*), silk.

Ian Guthridge, “Chairs”;
blackbean (*Castanospermum australe*), silky oak
(*Cardwellia sublimis*), woven monofilament nylon.

Pru Shaw, “Chair and Stool”;
laminated wenge, leather upholstery, stone, glass.



and for those of us interested in making



reality of the painted image itself. While Cezanne painted many different natural forms, his still-lives of apples reveal his intent most clearly; likewise, the studies of apple trees by Mondrian are a great place to see the careful analytical progression of his experiments in form.

Modernists in both design and architecture would increasingly reflect the structures of nature, expressing the tensions and forces of the materials. The Italian engineer Pier Luigi Nervi, working with various architects, designed some of the great structures of the mid to late 1950s. Rooted in the organicism of the Spanish architect Antoni Gaudí, the Nervi structures appear as huge veined leaf structures, reminiscent of the spreading apple trees of Mondrian. Prior to the engineering marvels of Nervi, the American sculptor Harry Bertoia made his wire mesh shell chairs for Knoll Associates in 1952. The chair appears as a rigid grid stretched into a shell form that accepts the person for sitting.

Some constructivist artists, such as Victor Pasmore from England and Eli Bornstein from Canada, explored three-dimensional painting, connecting to the formal ideals of Biederman. The ideas of Biederman have been pertinent when the fields of painting, sculpture, and architecture have on occasion drawn together to investigate their similarities rather than their differences. Nature takes an appropriate conceptual place as the inspiration



not only for form, but also as a structural process and approach. As Eli Bornstein points out in *The Structurist*, a journal she edits dedicated to the ideas of Biederman and his successors: “The word ‘structural’ means to build, to construct, to form, as well as the organization or morphology of the elements involved in the process. It can be seen as the embodiment of creation. The quest for structure in art has not only been a quest for form but for purpose, direction, and continuity.”

The constructivists’ strategy has been to build structure out, from the core of the object, as if subjective consciousness was being objectified. Gyorgy Kepes points out in *Structure in Art and Science* that structure is “revealed by science, constructed by the intellect, created by the imagination”—

things—organized by the hand.



Structure appears in many contexts; perhaps everything, including the intangible, has some intent, and even randomness becomes a structure of behavior. The anthropologist Claude Lévi-Strauss has investigated “surface and deep structures”—that is, the way things look, and what social behavior is structured into the work. Any objects we make will be following or questioning a deep structure of social behavior. Structure requires a balance of reason over passion, but that does not make the work passionless. Rather, spontaneity and expressiveness are simply reined in from a wild gallop.

CANBERRA STRUCTURES

Inevitably, all makers are involved in structure—everyone encounters it in their work. However, some projects appear more structural than others, as they focus on the “bones” or inner workings rather than the surface qualities of the “skin.” Canberra, Australia is the home of a group of studio workshop



CLOCKWISE FROM FAR LEFT—

Ian Guthridge, “Cabinet” [open and closed views];
wenge, veneered wenge, MDF, gold leaf,
stainless steel rod.

Ian Guthridge, “Hall Table”;
laminated wenge, veneered wenge, MDF,
patinated brass, stainless steel rod.

George Ingham, “Chaise”;
laminated red box (*Eucalyptus polyanthemus*),
woven monofilament nylon.

encounter is essential. The sparse elegance of the discipline informs the designing and making of work. Most makers reproduce what has already been done, rather than responding to what is being experienced at any given moment. Through observation, not duplication, the analytic process essential to a more complete understanding is achieved. From these values emerges structural simplicity with absolute attention to detail.

George Ingham is the head of the Wood Studio Workshop program at The Australian National University, School of Art. Ingham has worked with fellow instructor Ian Guthridge and, over the years, students Matthew Harding, Pru Shaw, and David Upfill-Brown to create an approach that continues the aesthetic inquiry into structure.

The use of nylon filament or coated shark line is a characteristic found in many of the chair seats from Canberra. The woven structure using contemporary solutions offer lightness and strength. The two dining chairs of George Ingham use the filament in the seat and back. A minimal frame that arcs up into space reaches across as a support for the back. The semi-transparent plane of the seat and back is analogous to the structural veins of a leaf...perhaps even a stringed instrument. However, Ingham is not dictated by the restraints of natural form, and in the “Chancellor’s Chair” social behavior gets woven into the structural expression. The high-backed chair is typically the woven linear structure in the seat. The back in a development of ascending space rising from the floor; the chair’s back steps ever higher with its horizontal rungs made from stainless steel shark line. The crest

makers who have created refined structures impeccably made. The structural aesthetic from Canberra appears to be unique in the number of people from one region involved with these ideas. In their work, the “skin” and “bones” are synonymous; there is a high degree of transparency, and through the structures, light penetrates, acting as a metaphor for the search for understanding human experience and the world in which we live.

There are visceral similarities in the Canberra furniture, one to another, yet it does not appear at first glance to come from constructivism. It may be more akin to the furniture of the Viennese maker Michael Thonet or even the vernacular Windsor chairs of High Wycombe. Certainly, without its exquisitely-made joinery, the Canberra furniture would quickly fall apart. The absolute structural integrity of Shaker furniture

is greatly admired by these makers, though the lineage of this work may connect more directly to the aesthetic of Japan, as well as the work of Godwin, Rietveld, and the start of the Modernist movement in design.

And yet the style of the Canberra work is hard to completely nail down or fit within a particular tradition. It has the appearance of being concerned with structure, but seldom do the components use the familiar triangulation of a perfectly engineered structure.

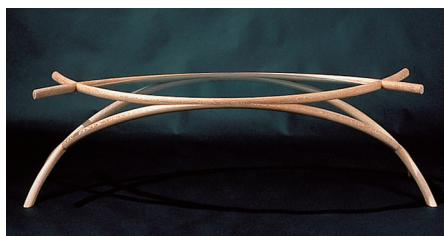
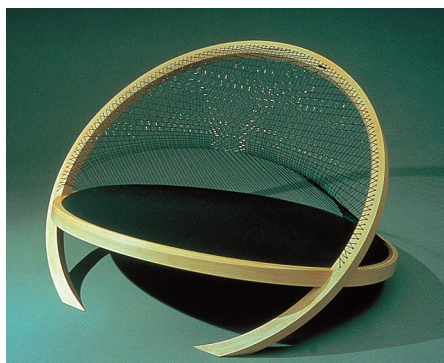
To this thumbnail sketch of the structural aspects, furnituremaker George Ingham brings values based in Kendo and Zen. Zen Buddhism developed among the warriors of 15th-century Japan, where technique evolved into discipline and the development of the self as a moral being. For these practitioners, no two situations are the same, and preparation for the next

CLOCKWISE FROM NEAR RIGHT—

Matthew Harding, “Eclipse Chair”;
laminated celery top pine (*Phyllocladus asplenifolius*), woven monofilament nylon, upholstery.

Matthew Harding, “Sprung Chaise”;
laminated forest oak (*Casuarina torulosa*),
woven monofilament nylon.

Matthew Harding, “Pisces Side Table”;
laminated silky oak (*Cardwellia sublimis*), glass.



at the top is sand-blasted into the shining stainless strings, subtly catching and dispersing the light. While many of the chair elements appear to be turned on a lathe, they may well have been machined at a router table. Whichever method is used, the joints and finishing have the essence of handwork of the highest precision.

The ascending form of the chair back is also expressed in the Pru Shaw “Chair with Stool.” Vertical elements are used to emphasize the structural height in a reaching, almost endless, gesture, contrasting the curved plane of the floating seat. Within the vertical slats an anomaly of colored glass is inserted that catches the light while acting as a spacer for the refined wood elements. References to stained-glass windows are easily made.

David Upfill-Brown’s chairs contrast with their horizontality. Seat, arm, and back elements float as a structural motif. All the curving elements of leg, back, and even the seat gather a visual speed of breaking waves moving from an imaginary horizon line. Analogous also to the apple trees of Mondrian, the form has a center from which the energy of perception flows. It is graceful and calming, yet it has simultaneously an edginess developing from the outward thrust and pointy ends of the arms and back structure. The lines are not overtly a study of nature; rather, the tensions of movement are expressed. Upfill-Brown spent time at The Australian National University, and now heads the Australian School of Fine Woodworking in Tasmania.

Ian Guthridge expresses the structural elements most directly. They are not analogous or metaphoric, and retain the presence of an engineered form. His back-

ground as a sculptor keeps him focused on essentials, even if that includes an unexpected use of “add-ons” to logically extend one structure in wood that benefits from additional elements in stainless steel to brace the existing form. His “Cabinet” has gold leaf in the door and a sub-frame in the base of stainless steel. The cabinet would probably survive without the additions, and yet the removal of the metallic elements would make the work obviously conventional.

The tension between elements is also articulated in the “Hall Table.” The curved arch pushes up, holding all the other structural elements. Hanging from the legs is a horizontal shelf captured within the geometry of the circle. Gracefully, the top floats above the complexity of the under structure as the table surface offers itself for use.

Matthew Harding is the poet among these makers. His public installations are renowned in Canberra, and show the greatest link to the ideas of surface and deep structures. His subtle appreciation for circumstance and the specificity of site makes his ideas work for the public and a more critically aware art audience. Pod-like structures draw our attention to the value of the urban forest and the relationship of culture and nature. The soft cushion positions ideas of comfort in the public square. It is an extension of the living room; a place of relaxation and entertainment, where ideas are exchanged in the heart of the market. Surface and deep

structures are profoundly evident. Science, art, and nature—whether its the nature of seed pods or the nature of people to congregate in the square for cultural exchange and entertainment—are gracefully evident.

His furniture structures are vigorously expressive and has an imaginative brilliance. They are on the edge of being wild, colorful, and loose, but never sloppy or absorbed by obvious patterns. The “Chaise” shows the influences and respect for George Ingham, though he brings his characteristic cocky flair to the form at hand. The aesthetics of the sketch are retained in the low table. Even with the technical brilliance of the work, the form remains generously expansive.

Aspects of structure, the idea of structure, has always guided the maker to some degree. I believe the people sitting in these Canberra chairs are sitting on the strings of a guitar. These are not necessarily the intentions of the maker, but poetic associations that connect some work over time.

The two histories described—Picasso’s cardboard construction of a guitar and the development of constructivism, and the influence of Japanese design on the modern movement and the Canberra makers—does clearly overlap and intertwine. For me, they are stories to be told of how forms and structures develop. They suggest ways of working that are fully engaged, and an intelligent response to our individual histories and the environments which we structure.

Stephen Hogbin makes furniture and other objects; he is also an author, teacher, and generalist. He lives in Warton, Ontario.