Bertoia's earliest known published work is a series of woodcuts done at Cranbrook to illustrate an avant-garde play written by a friend and privately printed in 1943. These woodcuts reveal an early mastery of line drawing based on an awareness of the work of Matisse and Picasso. Having been talked into doing them in spite of his preference not to, Bertoia considers these figural illustrations a deviation from his true interest at the time, which was completely abstract. A few years earlier, however, he had been working in a much more realistic manner, as the pair of woodcuts reproduced here shows (plates 4, 5). Nostalgic recollections of farm life in Italy, they have a marvelous narrative readability and a wealth of detail. The zigzag design of the one and the horizontal strips of the other point to his later woodblock experiments in abstract composition.

Since his earliest abstract drawings (plates 6, 7, 8, 9), Bertoia has drawn what he feels and not what he sees. He has tried several times to explain what drawing meant to him.

In a statement published in 1944 Bertoia said: "Drawing is a way of learning, a way of finding a truth. A line commences somewhere, gathers momentum, spends its energy and comes to an equilibrium equivalent to a life-cycle. It could also be said that it establishes its norm of balance and dimension. I draw what I don’t know in order to learn something about it." A year later, in conjunction with the production of a book of eighty-four of his drawings which, he said, were “not meant to tell a story nor to represent anything but themselves,” he wrote: “In a period of inaction a certain something begins to form, to ferment and to build up and around. However vague its content, its development continues relentlessly until it takes physical existence through medium, e.g., paper and ink.” Ten years later he revealed: “There was a time when I thought that drawing was a way of learning. I know now it is more.” In 1969, after more than twenty years, his drawings are still important to him. He does not like to sell any of them, for he considers them his “notebook,” the basis for all his work. Each one contains the seed of ideas for a number of his sculptures.
The medium for Bertoia’s drawings soon became almost exclusively printer’s ink on rice paper in an unusual technique which he still uses today for working drawings of his sculpture. Ink is rolled out on a table top and the paper laid over it. He then draws on the back of the paper either with his fingers or with a pencil or stylus, causing the paper to pick up ink from below in a soft, vaporous-looking texture. Sometimes a sweep of the back of his hand produces the background, picking up a shadowy reverse of the previous drawing to form the basis for the new one. Details are filled in in a variety of ways. Lines are drawn freehand, even the precisely repeated straight lines, and occasionally they are scratched into the still-wet ink after the drawing has been pulled from the table. Many of the early monoprints were begun this way (plates 10, 11). Colors were subtly muted and as early as 1942 he began using powdered metals to harden the inks and add lustre.

Other monoprints, like one owned by the Museum of Modern Art (plate 12), were made by cutting a woodblock into small identically-shaped sections and constantly rearranging these forms, a versatile invention, somewhat like Gutenberg’s movable type, for producing infinitely varied abstract patterns on paper. Light colors were laid on over darker grounds and metallic inks sometimes over all. The resulting monoprints were produced without pre-established designs. Most were done on transparent oriental paper and frequently they were framed in copper with glass on both sides so they could be hung in a window to catch the light. Some were done in series, like the movements of a symphony (plates 13, 14). Before leaving Cranbrook, Bertoia had a show, and many of the framed monoprints were purchased by his admiring colleagues.

The Museum of Modern Art print (plate 12) can be considered as either a horizontal or vertical composition. It has a background of soft greyed-blue with touches of deep navy blue, bright blue, and intense light blue. The small shapes are superimposed in muted oranges and the larger overlays are in metallic gold. The forms have a three-dimensional look and appear to be floating in space. A similar technique but different coloring and forms were used in the Guggenheim Museum’s *Multicolored Trapezoids* (plate 13) and in its counterpart (plate 14).

The monoprints still in the possession of the Guggenheim Museum (at least thirty-four) represent two styles of Bertoia’s work of this period—one dominated by line, the other by form. Lines are soft, or softened by the texture of the background on which they are drawn. Sometimes they are seemingly random doodles, but repetition is an important factor in holding the linear design together, as it is also in the form-dominated prints. Here are the beginnings of a life-long interest in the aesthetic effects created by identical forms repeated in varying positions in space.

Still another graphic work that combines both line and form is the Guggenheim’s small *Fugue* (6½ x 6½ inches). It contains a minimum
of very precisely placed elements in a beautifully balanced composition in reds, greens, gold, and soft browns. Bertoia’s paintings, which were mostly oils on masonite or other board, tended to be somewhat larger than the monoprints but reveal a similar variety of abstract compositions relating line and form in space.

From the first Bertoia’s monoprints received favorable critical notices. The 1943 Guggenheim show was reviewed by Carlyle Burrows for the Christian Science Monitor. While complaining, “There is not a great deal that one can describe intelligibly in a show of this sort even though its manifestations are varied and resourceful,” with regard to Bertoia he declared it was clear his work had been invited with special confidence. “Bertoia... works with precise but graceful line and delicate color and usually avoids the somewhat general ‘geometric’ classification into which the exhibited work falls.”5 Art Digest, reviewing the same show, called Bertoia’s prints “the nicest development of all the departures we found here.”6

Early in 1945 monoprints and jewelry were displayed at the Nierendorf Gallery, “filling three rooms and several cases.” One reviewer put Bertoia in Paul Klee’s sphere as “the one artist, if any, he follows.”7 According to another, he was “confirmed [as] one of the most inventive and original of the non-objective painters.”8 At a later showing where his prints were presented along with Ernest Mundt’s mobiles and Adolph Gottlieb’s oils, Bertoia’s work was lauded for its “feeling for space and texture.”9

In a review, “Tobey and Bertoia: Fantasy and Geometry,” Alfred Frankenstein wrote in the fall of 1945 about two separate shows at the San Francisco Museum of Art. Of Bertoia’s work he said, “The whole thing is very subtle in tone, texture, formal arrangement, and dynamic movement, and leads one to hope that a larger Bertoia show may be forthcoming.”10

The jewelry produced by Bertoia in the forties while he was teaching metalcraft at Cranbrook was as inventive and varied as his graphic work (plates 15, 16). Closely related in style to his monoprints and paintings, it is important in the larger body of his work as his first experimentation in designing with metal and presages the variety of form and texture of much of his later sculpture.

His fascination with the effects of light led Bertoia, while still at Cranbrook, to construct models, first in cardboard, then in metal, based on a uniform modulus (not unlike some of his cutout woodcut forms) wired together but spaced apart on different vertical planes. Though all parts are painted a stark white, when the model is placed in a window (plate 17), the gradation of values that the light imposes on the forms creates a varied pattern. This model formed the basis of one of his major concepts out of which later grew a group of important sculptures.

The path from monoprints and jewelry to furniture design, and finally sculpture, had a more logical progression than at first appears. The saga of the chair (or more appropriately, chairs) is an interesting
one. It all began back in 1940-41 when Charles Eames and Eero Saarinen won a first prize in an industrial design contest sponsored by the Museum of Modern Art in New York, with the design for a molded plywood chair they had entered as a joint venture. After winning the award, they went their separate ways, developing chairs in different directions. Saarinen’s famous “womb chair” was the final result of his part in that project.

Eames, on the other hand, moved to California to solve the problem of the high cost of the molding process which was preventing manufacturers from producing his chair. In addition to Bertoia, he persuaded Don Albinson, who now works for Knoll, Herbert Matter, a photographer, and Gregory Ayn, an architect, to work on the project. All contributed something. Drastic changes in the shape of the plywood and the metal frame resulted from Bertoia’s efforts to avoid torturing the wood.

Thus it was not “out of the blue” that the proposal came from Knoll Associates in 1950. Hans and Florence Knoll were very much aware of Bertoia’s activities in the field of design and the Knoll policy that “everybody here gets credit for his work” was guaranteed to appeal. Also, according to Knoll policy, the artist receives a royalty on each piece of furniture designed by him that is manufactured and sold.

The Bertoia chair (plate 18), which came on the market in 1952 and is still being sold through Knoll International, is completely different from the Eames chair, both aesthetically and functionally. Made of a web of wires welded into a basically diamond shape, then bent to form a graceful receptacle for the body, it is suspended cradle-like in a wire frame. It can be completely upholstered or merely seat-padded, leaving the backrest portion free to reveal the repetition of the basic diamond shape in its criss-crossed wires. It is an excellent design, functional yet full of grace.

Hans Theodor Flemming, author of several books and since 1946 art critic for Die Welt, wrote an article in 1960 surveying the American “pioneer spirit” in art which, he said, “caused more dismay than admiration in Europe, and especially in Paris.” Among other observations, in the course of which he complimented Bertoia’s architectural sculpture as “a happy synthesis of ‘free’ and ‘applied’ art,” he commented, “The metal chairs designed by Bertoia for Knoll International may also be works of art on a level with the allegedly ‘free’ creations of his colleagues.”

Bertoia also designed for Knoll a high-backed chair and ottoman, a side chair of criss-crossed wires with a square rather than diamond shape, and a bench made of metal and slats. By 1953 Bertoia had ceased thinking about furniture, although he remains to this day available to Knoll for consultation, and was devoting his full time and energies to sculpture.

Since Bertoia had worked with metals at Cass Tech, and at Cranbrook during his jewelry designing days, and with metal rods and wires for
Harry Bertoia, Sculptor

furniture both in California and Pennsylvania, it was natural that his creative talent should assert itself with these materials. Some of his earliest sculptures, done in California in 1947-48, have a spindly look and show his concern for vertical balance (plate 19). Many of those first exhibited in New York at the Knoll showrooms in the early fifties were based on line and repeated modulus in a variety of space planes (plate 20). Some were an almost direct translation into three-dimensional actuality of his illusionary graphics of the preceding decade. "The structures have a cellular regularity, organic like honeycombs, chemical like crystals. With neither a beginning nor an end, they lace through space without enclosing it, are jagged, unfinished, with a magical suggestion of continued movement," wrote one observer.13

"One prevailing characteristic of sculpture is the interplay of void and matter, the void being of equal value to the component material units," Bertoia has said.14 From the beginning his sculptures were constructions in metal using rods and wire to define space and to support abstract shapes usually cut out of flat sheets of enameling steel. He uses an acetylene torch for the cutting as well as for melting other metals—brass, nickel, copper—which he flows onto the forms and rods to obtain textured surfaces. He employs industrial metal shot to enhance the textures. His works are sometimes gilded and frequently lacquered to preserve their surfaces. He is constantly experimenting with different metals and his experiments have often led him into entirely new areas of sculpture.

When Bertoia became interested in bronze casting, for instance, characteristically he began by experimenting and developed a direct casting process all his own. Following is a description of this technique published recently in Craft Horizons:

Harry Bertoia experiments with pouring the molten metal with a minimum of limiting mold, or with no mold at all. This takes us back to an aspect of casting so ancient that its origins are unknown, except that it must have preceded lost-wax and sand casting. It is also putting to serious use the foundryman’s game of pouring out the metal at the end of the day and remarking on the free and evocative shapes it assumes in hardening.

Bertoia pours his molten bronze in a shallow, concave pit, and then works on the surface of this metallic pond as it cools by scraping, cutting, punching, and adding water to cause parts of the metal to cool more rapidly than others. The end result is a large, flattish, torn relief puckered, blistered, and otherwise textured and with a curiously fascinating color.15

This is a fairly accurate description of his "action sculpture" technique, except that for reasons of safety, water is not poured until after most of the action is over. In addition, Bertoia likes to relate stones to metal and collects a pile of smooth and rough ones of varying sizes in his studio, to be plunged into the molten mass at the proper time.