



Sketch for Ingalls Hockey Rink at Yale University 1953, reveals the close integration of form and structure.

At Cranbrook, they used to say of Eero Saarinen's work that "that his paws were showing." "We looked at some of Eeros' things," Charles Eames remembered, "as having the beauty of a puppy." Photographs and others' impressions reveal an engagingly rumpled man, sleeves rolled up, tie undone and shirt coming out of the trousers.

His architecture was like that too; it is workman-like rather than self-consciously "creative"

In each of his individual designs the "vocabulary of form", was likely to be startlingly different from any of the others. The thing that they did have in common, was the fact that, to a remarkable degree, each building and furniture design as well, turned out to be in itself a model of the problem.

Eero Saarinen's furniture was an integral part of his work as a designer. While his architectural office continued to produce custom designs for a client's specific needs, his major interest from the 1940s onward was in mass-produced furniture.

It is a measure of his commitment to his work that he was able to pursue in essence two careers (as an architect and furniture designer) at the same time.

The Paris Exposition in 1925 was an important event due to the emergence of the "International Style" by Corbusier and others - on the future furniture designs of people at the Bauhaus School. This was followed in the late twenties by a series of remarkable designs by Mies van der Rohe that formulated a new conception of the chair with tubular steel cantilevered frames and minimal upholstery.



Interior lobby for General Motors Technical Centre, 1956



John Deere H.Q. Illinois, USA.

Saarinen planned the roads carefully, keeping in mind how the building would be seen as one drove along the man-made lake up to the carpark behind the building and then on to the entrance

Breuer's tubular steel chairs were also conceived during this time. By the mid-thirties, Alvar Aalto had extended this aesthetic of minimal mass and a clear articulation of frame and seating area to include two-dimensionally laminated wood forms.

By the late 1930's, a younger generation of students and faculty gathered at Cranbrook (USA) that were to exert a profound influence on Eero Saarinen.

The important friendships that began among this circle were to affect profoundly their personal and professional lives over the succeeding decades.

The last years before World War II were a germinal time for modern design in America, and it is these years that have often been called the "golden moment" at Cranbrook. .

Of the younger generation at Cranbrook, Eero Saarinen was certainly the most universal designer. As he said in a 1960 speech in Munich, "my father, Eliel Saarinen, saw architecture as everything from city planning to the ash tray on a living room table.

"This is what I also believe"

Eero Saarinen's approach to the design of interiors and furniture was characteristic of a significant segment of American design in the late 1940's and fifties.

First, Saarinen conceived of an interior and its furnishings in terms of the overall architectural conception of a building. Everything down to the smallest detail had to be a part of this "organic unity" a concept that Saarinen acknowledged he had learned from Frank Lloyd Wright.

"A room is like a piece of art – it is just one idea."



Secondly, contemporary design should be expressive of a twentieth-century world on show, particularly avant-garde painting and sculpture.

The Industrial Revolution had necessitated fundamental changes in our society; and to meet the demands of the modern age furniture had to be mass-produced, and interiors must assume a certain anonymity.

The mass-produced walls and spaces and the mass-produced furniture must never lose their impersonal character. These mass-produced elements are to the interior as structure is to architecture." One's identity could be expressed by "ornamental or non-structural elements", flowers, paintings, books, and handcrafted objects.

Eero Saarinen brought an additional richness to his buildings – particularly in the case of sculpture and colour treatments – through a continuation of the Cranbrook tradition of collaboration with other artists.

In 1939 Eames and Eero Saarinen designed an exhibition of the resident faculty's works, which was installed at Cranbrook Pavilion. It was an architectonic installation with wood structures used to define areas and act as display surfaces.

Saarinens' and Eames' most famous collaborative efforts were their entries for the "Organic Design in Home Furnishings Competition" held at The Museum of Modern Art in 1940-41, for which they won two first prizes for a series of chairs, modular storage units, sectional sofa, and tables.

That competition may now be seen as the presage of the important developments in American furniture design in the third quarter of the twentieth century, and it clearly established Saarinen and Eames as leaders in the modern design movement.

Saarinens' and Eames' achievement in 1940 was in bending laminated wood in a third dimension and in creating a new aesthetic featuring a lightweight moulded shell on an attenuated base.

As Eero Saarinen himself later noted, "New materials and techniques have given us great opportunities with structural shells of plywood, plastic and metal.... The problem then becomes a sculptural one, not a cubist, constructivist one"

The first evidence of Saarinen's maturity as a furniture designer was his entries with Charles Eames for the Organic Home Furnishings competition (1940-41) noted earlier. The outbreak of the Second World War prevented their immediate manufacture.

After Florence Knoll joined Knoll Associates (c. 1943), one of the primary achievements of the company was enlisting a generation of young designers.

Eero Saarinen joined Knoll around 1943.

Saarinens' work with Knoll in the 1940's and 1950's serves as a design yardstick - a standard of excellence difficult to surpass. Remember the intricacy of his designs pre-dated computer aided design modelling

His first design, still working with wartime limitations, was the no. 61 "grasshopper" lounge chair and ottoman (c. 1946). The profile of the laminated wood base (laminated wood was all they could get due to war rations) with multiple bends was contrasted against a sculptural seating panel.

The chair was quite comfortable and was available upholstered or with webbing. "The grasshopper chair was a perfectly nice chair," according to Mrs Knoll, "but it wasn't one of the great successes."

The breakthrough came with his work in molded fiberglass, in particular with the wide, flaring object which has gone down in the books as the "womb" chair, a part of popular iconography so familiar that

it isn't always identified with Knoll. In good part it was Mrs Knoll's idea. "This was at my specific request because I was sick and tired of those chairs that held you in one position....

He was going to do a whole series of fiberglass chairs. It was a general plan. I said, 'Why not take the bull by the horns and do the big one first?' That's what happened.... I wanted a chair that was like a basket full of pillows.

Well, it didn't quite turn out that way, but I wanted something I could curl up in."



The material that was to have the greatest impact on furniture design at mid-century was plastic. A new material for the furniture industry, its potential was realised during the 1940s by a number of designers working on innovative chairs.

Eero Saarinen published sketches in the March 1946 issue of *Interiors* showing several prototypes for moulded shell chairs.

Saarinen began his designs for his no. 70 lounge chair (the womb chair) as early as 1946, but it was not manufactured until 1948 by Knoll, making it the first fiberglass chair to be mass-produced in America.

The chair has a molded, reinforced plastic shell with foam rubber padding and fabric cover; a seat and back cushion were added for additional comfort. The base was of metal rod with a chrome or painted finish.

Prototypes of the chair show Saarinen's struggle to find a base for the powerful shell that would work structurally and aesthetically; the junction of the plastic or plywood shell with its base was, in fact, one of the major problems facing furniture designers at mid-century. The introduction of a successful design to the Knoll line invariably resulted in spin-offs: in this case the no. 74 ottoman (womb footstool) (c. 1950) and the no.73 settee (womb double sofa), Saarinen's only mass-produced sofa.

From Florence Knoll's point of view the most decisive step – "the first big excitement in the whole development of Eero's furniture" – had been the adoption of the no. 71 chair of molded sisal and plastic standard by General Motors for its technical center in Warren, Michigan (1948-1956), which Eero – taking over from his father – had designed.

This arose directly out of an architect's perception that the buildings he was creating required furniture to match, and it was a happy circumstance that General Motors, as he put it, was a "great client."

The no. 71 and 72 armchairs "chairs with the holes in the back" became some of the most widely used office chairs of the twentieth century. Eero Saarinen also produced a custom design for a lounge chair and sofa used in several of the lobbies.

Saarinen's experiments with plastic are continued in the fiberglass back, but the seat is a standard wood panel with foam rubber upholstery. The design is derived directly from the Organic Design entries. The soft sculptural forms, though, belie their simplicity: a close examination of the detailing of the base, shell, and upholstery reveals a masterful design.

Eero Saarinen's last furniture design for Knoll was the so-called "pedestal" series (1955-57). Saarinen felt that he had resolved the problem of "the slum of legs" in a room, and he achieved perhaps the most successful resolution – at least visually – of a plastic shell to its base, though not his goal of a sculptural shell in one piece and of one material.

The chairs rise out of the floor on a single stem to a shell of soft folds, almost flower-like.

In reality, the shell is made of molded plastic but a stable base could only be achieved in cast aluminium with a matching fused plastic finish. While the chairs have been justly praised, it is perhaps the line of tables that is most pleasing. The large tables, in particular, with their composition of a floating plane on a single thin pedestal, have an elegant - if not an ethereal quality – that makes them one of the assured classics of the twentieth century.

As is all Saarinen's designs, evidence of his early training as a sculptor are not far from the surface.

The times he lived in exhilarated him. "We are in one of the great formative periods right now," he said. "It began about 1900 and it may last for the rest of the century. The ground rules and the general directions have been set, but there is still much to be done before the form of our time really emerges. New structural materials, new uses, a new spirit for our age". "Architecture is not just to fulfill man's need for shelter, but also to fulfill man's belief in the prouder, more aggressive, much richer and larger than we see it today. I would like to do my part in expanding that richness."

He was anything but passive about it. "Eero had a very competitive nature - he liked to stake out claims." In spite of his capabilities as an architect, his principal notion was that of accomplishment in winning.

Eero made his reputation in competitions.... He would go to any extent to find out who the members of the jury were if they were not announced then research everything they had done.

He'd pay anybody else who had lost earlier rounds of the same competition...to send him their losing parts so he could see what they did.

He never solved a problem by doing one solution. He came at a solution by process of elimination. He did a thousand solutions for one design. You got what you got by throwing away everything that wasn't as good – but you tried everything.



Quarter scale 1:4 models made by Don Petit (at Knoll studio) during the development of the Knoll pedestal furniture series by Saarinen



Patent office designs application



Knoll "No 71" chair , 1950 made for CBS INC.



Knoll Womb chair "No 73" , 1948



Sketches made by Saarinen of the Pedestal Chairs, 1955.

Saarinen came to the solution - the long way - through a process of elimination. First he would do a thousand options for each product design. Then he would throw out those that didn't work. So the result was what ended up being left !. He would try everything to satisfy himself that he had considered all possible choices.



This search for strong sculptural forms enclosing large interiors spaces culminated in three famous architectural buildings:

- Ingalls Rink at Yale University
- TWA Terminal
- Dulles Airport

With its massive concrete spine and wood deck supported by longitudinal cables, the Ingalls Rink is not unlike an inverted boat's hull. The vaulting space with its sense of movement and energy embodies the speed and action of the game on the ice.

This desire for expressive interiors reached its culmination in the soaring vaults of the terminal for Trans World Airlines, at Kennedy Airport, New York (1956-62). Here Saarinen wanted to create an interior that would express the "excitement of travel".

The bilateral terminal consists of four enormous vaults divided by bands of skylights. A central soaring bridge separates the two main areas for ticketing and waiting. Stairs, counters, and seating are all integral to the sculptural whole; the red seating area provides an accent of colour to the off-white and light grey surfaces.

Dulles, outside Washington, is a serene pavilion that seems to be suspended above the Virginia plains. From the exterior, it is certainly one of Saarinen's most arresting forms; the interior, however, seems less successful than TWA. The space is too low for such a long building, and the counters, shops and service areas interrupt the unity of the dramatic space.

Such temple-like structures cannot easily accommodate numerous functional demands.

Eero Saarinen had a furniture philosophy as consistent as his philosophy of architecture, though again the products of it did not necessarily resemble each other. He sought for the essential idea and reduced it to the most effective structural solution within an over-all unity of design. "Perhaps the most important thing I learned from my father," he told a meeting of the Society of Industrial Designers, "was that in any design problem one should seek the solution in terms of the next largest thing.

If the problem is an ashtray, then the way it relates to the table will influence its design. If the problem is a chair, then its solution must be found in the way it relates to the room..." He designed the pedestal furniture, including the "tulip" chair, not because he was thinking about that particular shape, but because he was thinking about rooms.

"The undercarriage of chairs and tables in a typical interior makes an ugly, confusing unrestful world," as he put it. "I wanted to clear up the slum of legs.

I wanted to make the chair all one again."

Eames thought this – and a phrase like "the slum of legs" – was characteristic of him.

"Eero was a concept man," in Eames's opinion. "The Womb chair was an idea and a concept. The name is very typical of Eero – to take a word that doesn't particularly sound like a decorator's vocabulary. A simple concept like that was very close to him. So was the pedestal."

In moments of dissatisfaction Saarinen would reproach himself for thinking only of the big forms, while other like Eames concerned themselves with details.

But, said Eames, "in many respects this is where his greatness lies."

Knoll is very proud of its association with Eero Saarinen. His work in the postwar period being the refinement of classic ideas in terms of new materials and techniques – ushered in. A new era in office seating design. His work with Knoll in the 1940's serves as a design yardstick, a standard of excellence difficult to surpass.

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