THE STRUTT HOUSE

A MODERN MARVEL OF GEOMETRY AND MATERIALITY.

BY TITANIA TRUESDALE

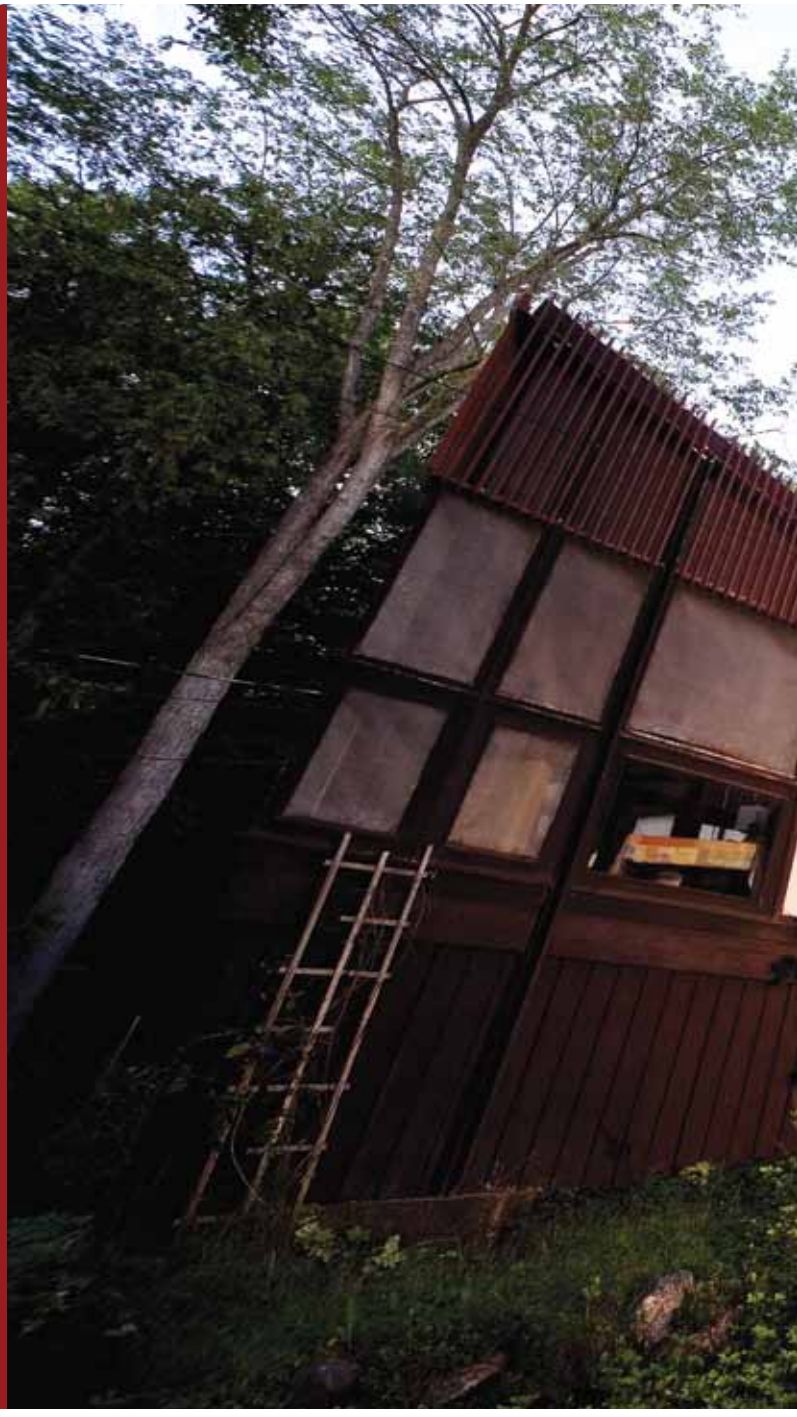


Photo: Couvrette/Ottawa

When you first visit the Strutt House, an oasis less than 15 minutes from Ottawa's downtown core, there is no doubt you are approaching an unusual home.

The Strutt House, Mountain Road, Gatineau, Quebec.

La maison Strutt, chemin de la Montagne, Gatineau (Québec)

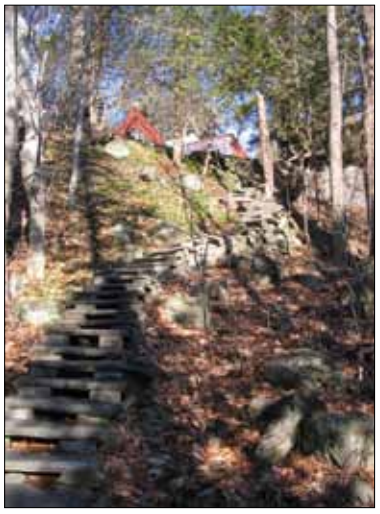


Photo: Katherine Meredith

The original approach to the protruding geometric-shaped house followed the contours of the hillside.

Le sentier original menant à la maison géométrique protubérante suivait les contours de la colline.

James Strutt designed the house in 1955-56 for his growing family. Perched on the most southerly slope of the Gatineau Hills, the unique geometric form protrudes from the hillside, well below its crest yet still with a view to the valley below. The skyline of Ottawa is just visible on the horizon. The climb up to the house was originally 119 steps that followed the natural contours of the hill. A new staircase added by Strutt's daughter (the current occupant) makes the ascent easier, but the house and site still leave you breathless.

THE MAN BEHIND THE PLAN

During the mid-1950s, James W. Strutt was seen as a rising star in Canadian architecture. He spent his early years in Pembroke and Ottawa before attending the University of Toronto's School of Architecture following his war service in the Canadian Air Force.

After his graduation in 1950, his professional career as a Canadian modernist architect was meteoric. His geometric design influences came from Frank Lloyd Wright's organic approach and Buckminster Fuller's space-frame structures. At the time the Strutt House was built, he had just been elected Chair of the Ontario Association of Architects, the youngest Chair in its history.

Strutt's style, evident in his many and varied commissions, involved complex geometries and weight-efficient structures sensitively integrated into their natural environment. Those ideals evolved into a very distinct reflection of the man and his time and place.

PARTY CENTRAL

Strutt and his wife Audrey were a striking couple who frequently appeared in the society pages of the day. Strutt, described as tall and lean, was likened to a dashing racing car driver or TV host. The couple was renowned for attending galas and hosting great parties. They both had keen minds with interests running from anthropology to municipal zoning. They often travelled to the opposite end of the continent, even if just for a day, to catch a prominent modernist thinker, an avant-garde jazz musician or a contemporary art exhibition. Both were committed to their growing family of four children.

For Strutt, designing his own home presented an opportunity to create a house that met his and Audrey's needs in a modernist form. His senior partner, Bill Gilleland, encouraged him to work on a couple of modern International Style homes. Strutt decided to bring some of those modern concepts together with a more Canadian palette of materials and his interest in non-orthogonal geometries (curved or non-perpendicular lines), thought to help free up the intellect of the inhabitants.

By the 1960s, the Strutt House became one of the social destinations of its day, attracting the "who's who" of Ottawa society, from architects, developers and academics to embassy staff, members of the press and members of Parliament—including Pierre Trudeau who, according to Strutt, was remembered for some elegant late-night dives into the pool.

Detailed preliminary sketch of the house in its natural setting.

Croquis préliminaire détaillé de la maison dans son cadre naturel.

Draft: James W. Strutt original drawing/ Library and Archives Canada

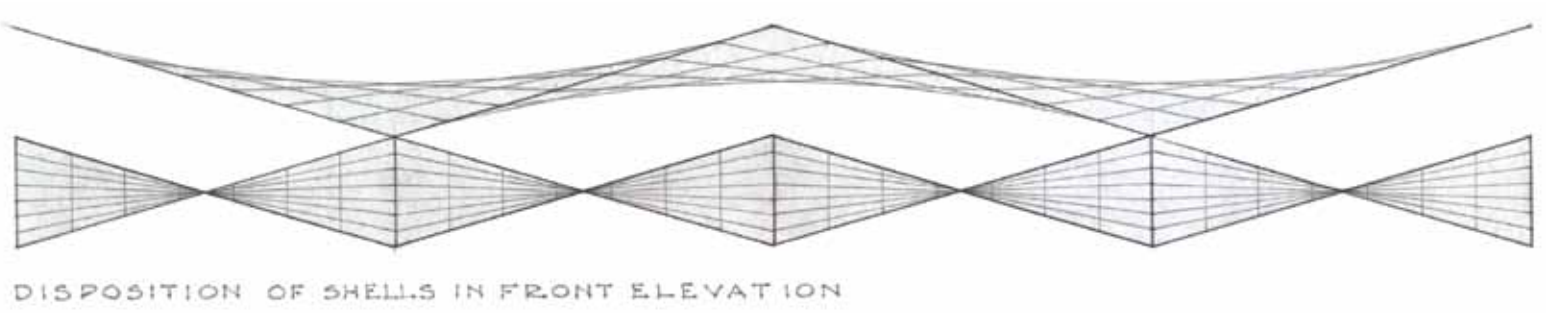
Photo: Legg Brothers Ltd./James W. Strutt Estate Collection

James and Audrey Strutt in the living room with children and friends, circa 1958.

James et Audrey Strutt avec leurs enfants et des amis dans le salon, vers 1958.

A STAR EMERGES

The swimming pool and its surrounding deck are the first things you notice on the climb up to the Strutt House. The offset angular planes of the front façade on the plateau above quickly come into view. The lower walls mimic the mountain's granite outcrops, thrusting up off the surface of the hill. The upper wall—a tall expanse of glazing—reflects multiple angles of the canopy of trees you are moving through. You are immediately aware of the surrounding natural environment and the unusual geometry of the house. This is the first of many contrary and yet reciprocal relationships that Strutt exploited in this project.



Disposition of triangular shells in front elevation.

Disposition des coquilles triangulaires dans l'élévation avant.

Draft: James W. Strutt original drawing/ Library and Archives Canada

The house is placed to take advantage of the four natural plateaus that sculpt the hill. At the front, where the slope drops away, wood posts rise up from the footings, lifting the structure and giving the forward, public areas of the home a sense of being cantilevered out over and into the forest below.

The lower portion of the house is skirted with a dark-stained cedar, which accentuates the raised horizontal line of the main level and serves to ground the building visually. This plateau also accommodates the concrete block central core that encloses the service/utility spaces and most of the kitchen and circulation areas. A large fireplace projects out from the core, the hearth capped by custom metalwork created by a local artisan.

The back of the house is on the upper plateau and holds the private areas of the home, the bedrooms and bathroom. Set among rocky outcrops and tree trunks about a metre higher than the front area, it sits flat on grade, appearing almost in the hill. Here the house seems anchored to the site.

Mixed deciduous and coniferous trees encircle the house. Other than the clearing for the building footprint, trees were left where they stood and they populate the beautiful gardens that were meticulously planned by Audrey to reveal the plethora of indigenous plants from the area. The variety of blooms and flora add colour and depth to the forest floor. Groupings of perennials seem uncontrived, their transition to the natural surrounding undergrowth almost imperceptible.

Glancing up, you notice that the building straddles the upper two plateaus of the slope. Triangular footings tied to the natural granite bedrock play off the triangulated form of the house. The central core has a poured foundation with beams that radiate out to posts set along the perimeter footings. These beams support 2-inch-by-10-inch joists that form both the upper and lower platforms. This design minimizes the potential of racking or twisting of the structure without using cross ties.

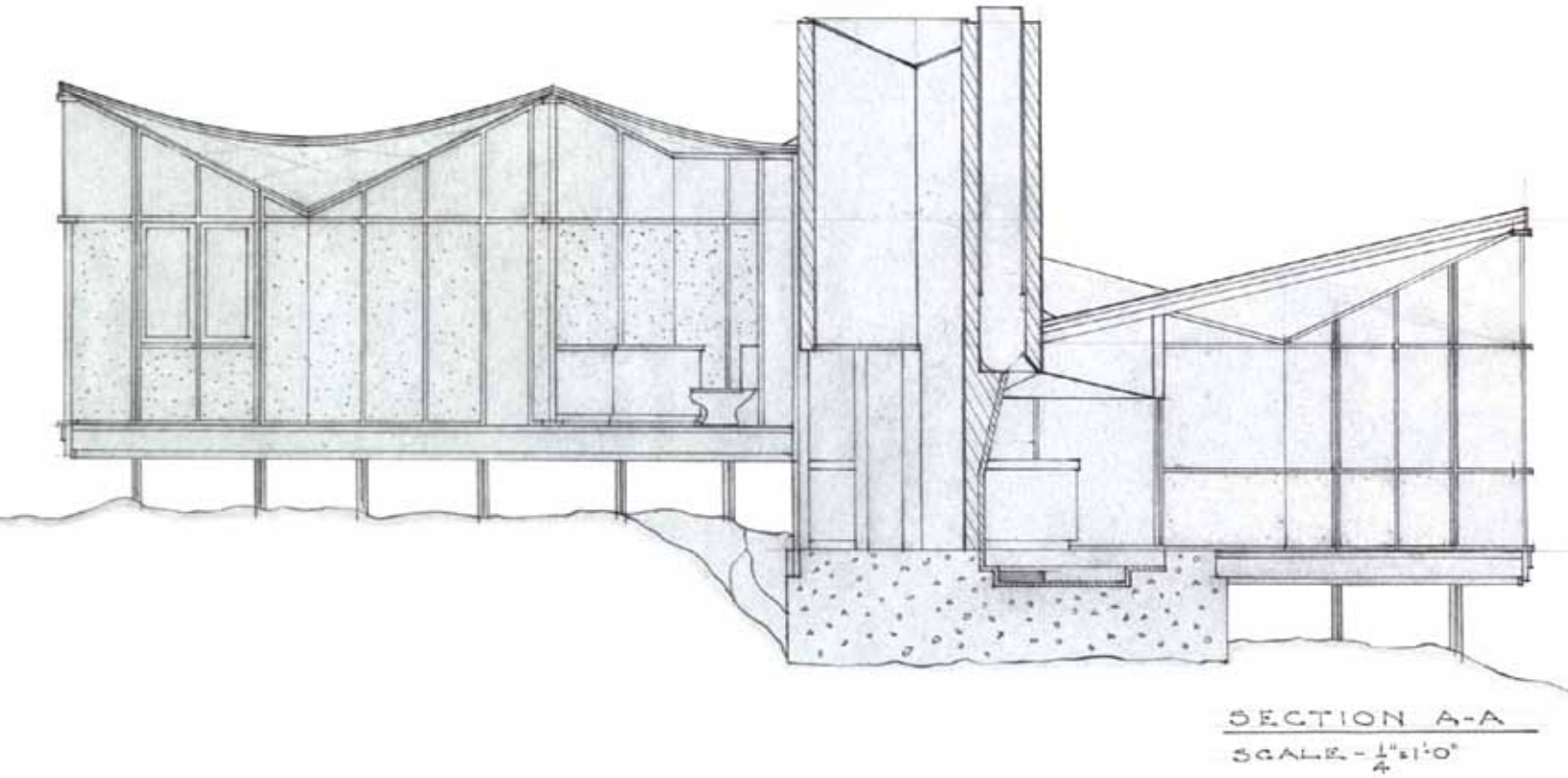
A rabbeted 2-inch-by-6-inch board was the standardized element used throughout the structure. This pre-cut unit was used to create all sills, heads, plates and jambs as well as being jig assembled into 8-foot modular structural framing sections which were then erected on the platform (see illustration on page 16).

These framed sections were filled with the appropriate envelope materials—Styrofoam insulated panels, fixed glass, sash and doors—all according to the design. Each of the infill items was intended as a divisor of the 8-foot structural unit—2, 4 or 8 feet—and was simply fitted into the frame. The triangulated glass panels below the undulating roof were built using the standardized elements as well.

RAISING THE ROOF

Closer to the house, the roof becomes the dominant feature, both externally and internally. Its hyperbolic paraboloid surface is the starting point for many of the form and structural decisions elsewhere in the home.

The roof projects out from the central core, floats upward flowing horizontally, undulates along the extremity and accentuates the enclosed angular spaces at the perimeter of the building.



Section drawing shows the house straddling the two plateaus of the slope.

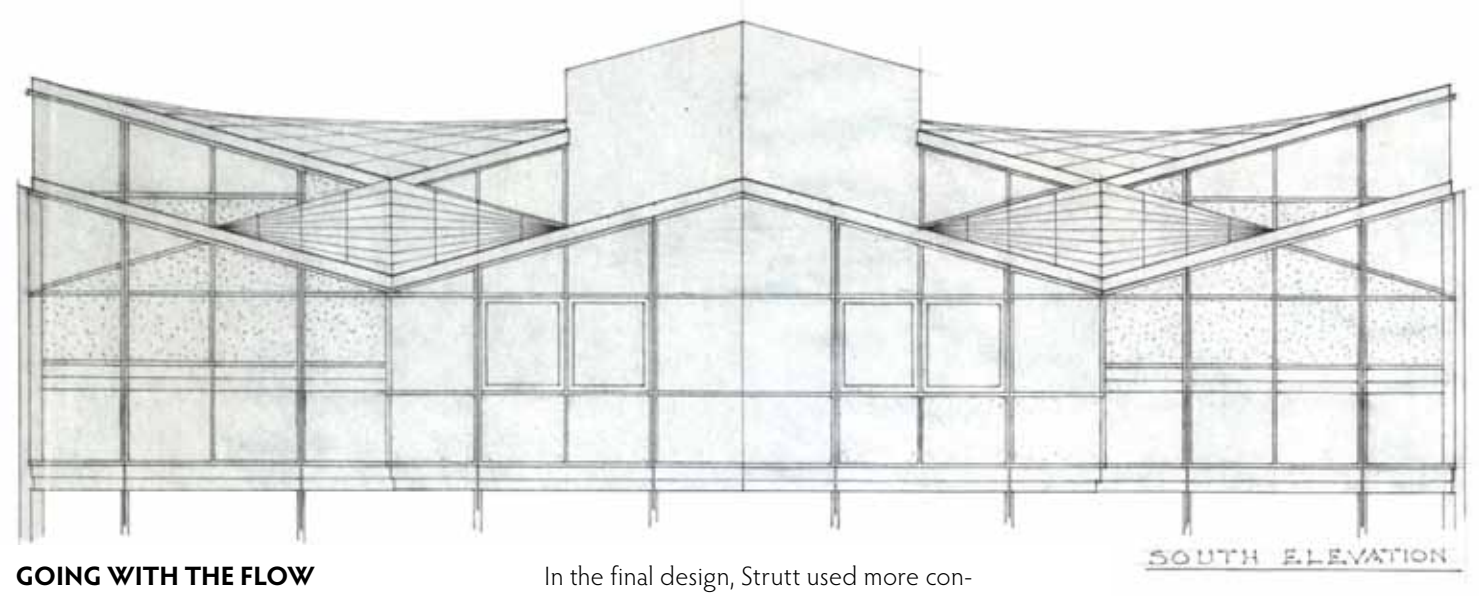
Dessin en coupe de la maison chevauchant deux plateaux de la colline.

Draft: James W. Strutt original drawing/ Library and Archives Canada

Throughout the home's interior the warm wood overhead that blankets every room is never overwhelming, but reinforces the sense of being in a natural environment. The repetitive lines in this first known central Canadian example of wooden hyperbolic paraboloid pull your gaze outward to the large windows and into the surrounding nature.

The roof looks complex yet is structurally simple. Built to carry a 50-pound snow load as well as its own load, the hyperbolic paraboloid is virtually self-supporting along the perimeter. A hyperbolic paraboloid is a series of non-parallel straight lines that are close together at one edge and farther apart at the finish edge (see illustration on page 14). Small beams projecting from the core serve to transfer the thrust between each of these forms.

To create the straight non-parallel lines, chamfered tongue and groove 2-inch-by-4-inch spruce boards were placed against each other without leaving gaps. These were then nailed every sixteen inches on centre with 6-inch spikes, shifting the centres 8 inches with each successive board, creating continuous lines of steel reinforcing every 8 inches. The resulting shells form not only the structure but the interior ceiling surface as well. These were topped with 2-inch Styrofoam insulation (which has since been increased but at the time was a novel application) and a roofing membrane. The entire assembly is only 4 inches thick.



Detailed drawing of south-facing elevation.

Croquis détaillé de l'élévation sud.

Draft: James W. Strutt original drawing/ Library and Archives Canada

GOING WITH THE FLOW

The interior of the house is built on an open concept with few partitions. Many areas were designed to allow activities to flow from one space to another. For example, the partition between the children's rooms is actually a sliding door that, when open, converts the space into a playroom.

Strutt also designed many of the furnishings, playfully taking advantage of the geometries and still leaving wall and corner spaces to allow inhabitants to move things around.

STEPS ON THE ROAD

The Strutt House project had several variations before its final version, starting with a small cottage in 1951. Its cloverleaf design was formed by three intersecting hexagons clad in local cedar. It had a hexagonal glass skylight in the centre, complete with a matching hexagonal translucent plastic outhouse. The family lived here for several years while Strutt designed the second version.

The second version had three interconnected space frame modules designed to straddle the three plateaus centred on the site. Strutt sent the plans to Buckminster Fuller, who enthusiastically encouraged Strutt to build the project. Nonetheless, Strutt stopped construction after the first foundation had been hand dug. He realized that, although true to Fuller's philosophies, the design was not appropriate to the site. And its size was not within his budget. This first foundation hole now serves as the swimming pool at the foot of the garden.

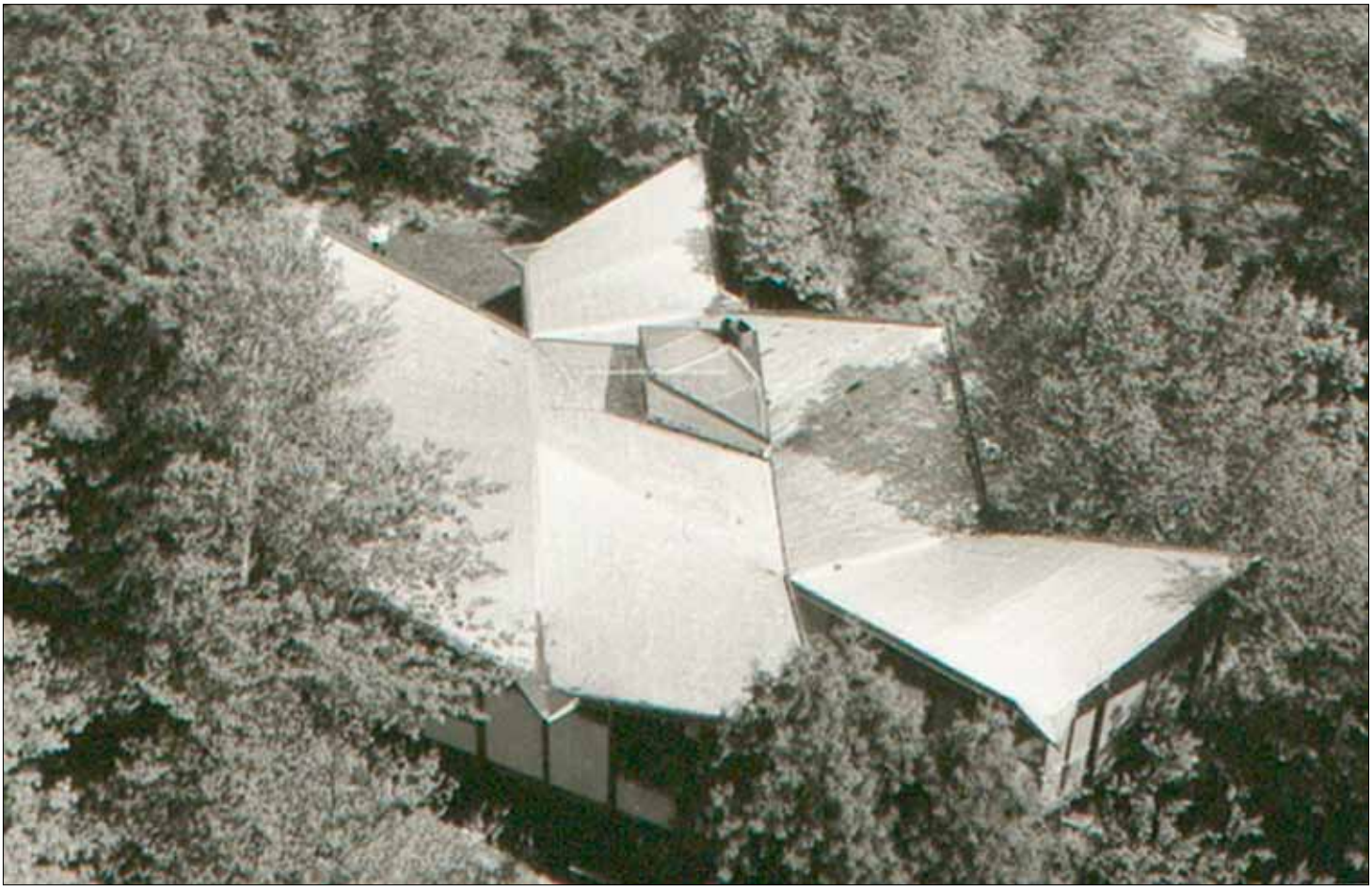
In the final design, Strutt used more conventional building methods and materials to achieve minimal weight for maximum structural integrity. The technique was different, but easily implemented. Nods to the original space frame design are included at the lowest plateau near the base of the hill and in the design of the carport built several years later.

In the June 1958 issue of *Canadian Architect* magazine Strutt explains that the experimental design used conventional mill-frame and mill-roof materials and building methods to allow for future applications. This structural system also offered more efficient construction: it was completed in just six weeks.

A PART OF THE LANDSCAPE

Strutt felt this project represented his life's work. He was both surprised by and grateful to the Canada Mortgage and Housing Corporation for approving a mortgage for the house despite its unconventional design. This validated his work and gave him and his clients the confidence to try more exploratory architecture than was the norm—then or now.

Leaving the Strutt House and looking back up through the trees, the house is barely visible even though you know it's there. It appears to settle back into and project forward from the hill. It conveys an inclusive and inviting gesture that says both "welcome" and "come back soon."



Photos: Katherine Meredith

Titania Truesdale has a B.A.S. and M. Arch. from Carleton University's School of Architecture. A project consultant working with major "have-and-hold" property owners, her own practice focuses on the development, design and stewardship of "living environments." She is currently writing an authorized biography of James W. Strutt.

Above: Aerial view taken from the rear of the house reveals the detail of the hyperbolic paraboloid roof structure with protruding central core.

Top: Interior views detail the unique wood ceiling, Strutt's original built-ins and the natural light reflecting across the deep red Battleship linoleum floors. (The wood-burning stove was installed over the original pit fireplace.)

Ci-dessus : *Vue aérienne de l'arrière de la maison révélant le détail de la structure de paraboloïde hyperbolique du toit ainsi que lélément central protubérant.*

En haut : *Vues intérieures du plafond de bois. Les encastrés de Strutt et les reflets de la lumière du jour sur le linoléum Battleship d'un rouge profond. (Le pôele à bois a été installé pardessus le foyer d'origine.)*