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Architecture Beneath the Surface

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LAW LIBRARY ADDITION, UNIVERSITY OF MICHIGAN BY GUNNAR BIRKERTS

ARCHITECTURAL RECORD

MARCH 1982

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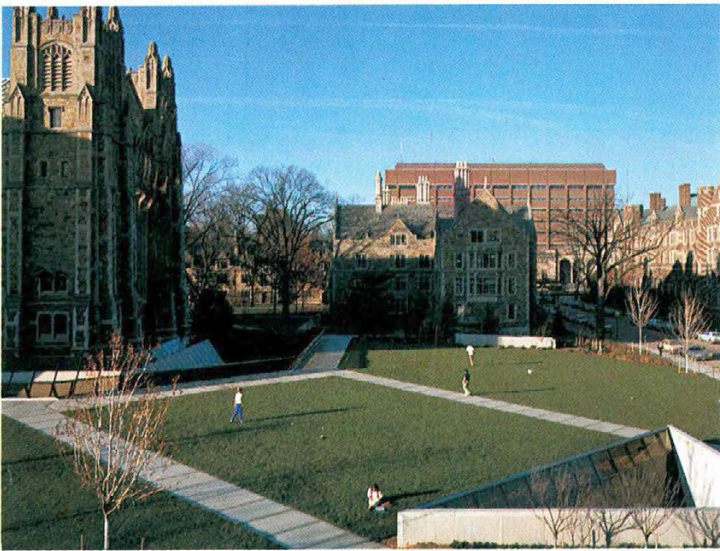
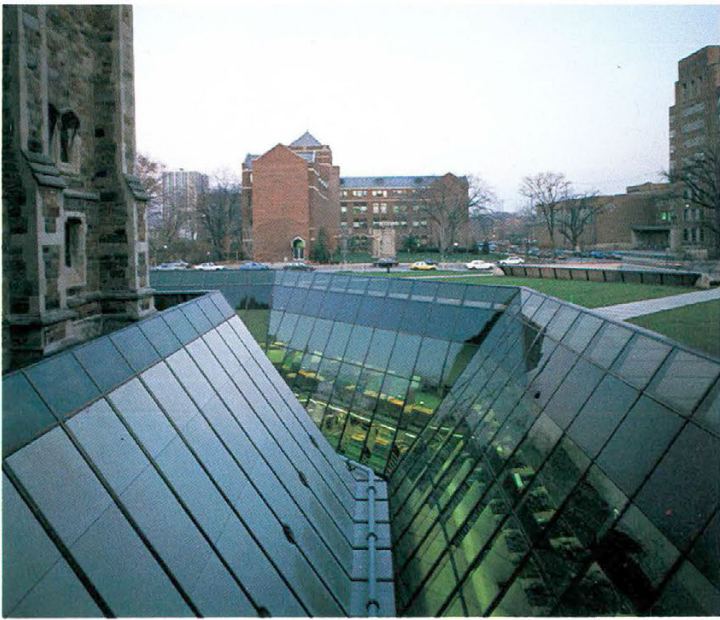
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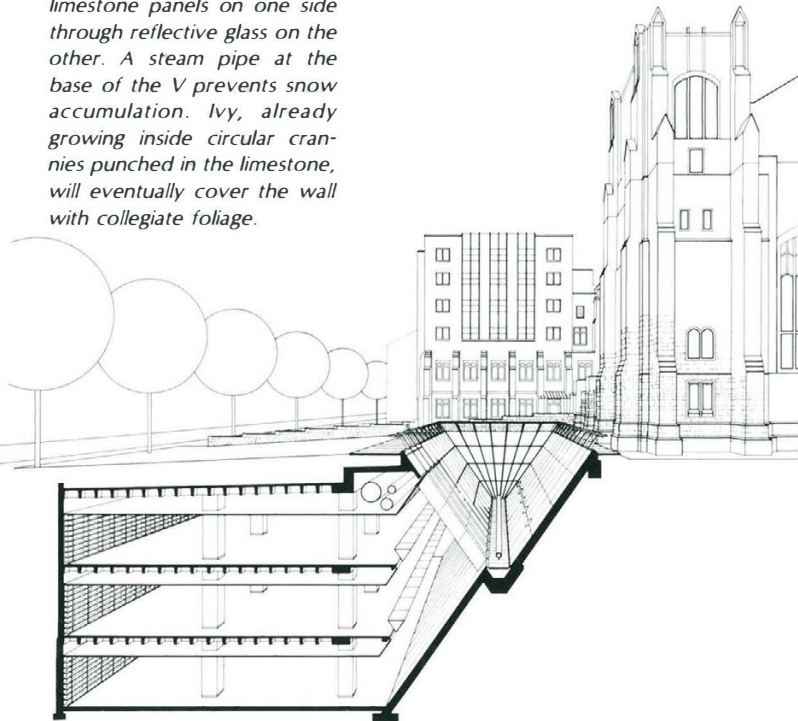
Timothy Hursley, Hursley-Lark-Hursley photos

ARCHITECTURE BENEATH THE SURFACE

All his working life Gunnar Birkerts has been captivated by the effect of light on architecture. He comes by the fascination naturally—though he is Latvian by birth and American by citizenship and experience, his soul, he says, is Finnish. And early association with Aalto and the younger Saarinen nourished his Scandinavian bent for husbanding and celebrating precious daylight. What greater challenge can offer itself to such an abiding love than the design of a building deep underground? The underground building in question here is a large library for the University of Michigan's prestigious law school, where students cracking their books get a plenitude of daylight and a multitude of views. The puzzling photographs on this page and the cover show the reflective glass moats that perform the sorcery. —*Grace Anderson*



The major source of underground daylight at Michigan's law library is a V-shaped moat stretching 160 feet along two sides. Light rebounds from limestone panels on one side through reflective glass on the other. A steam pipe at the base of the V prevents snow accumulation. Ivy, already growing inside circular cranies punched in the limestone, will eventually cover the wall with collegiate foliage.

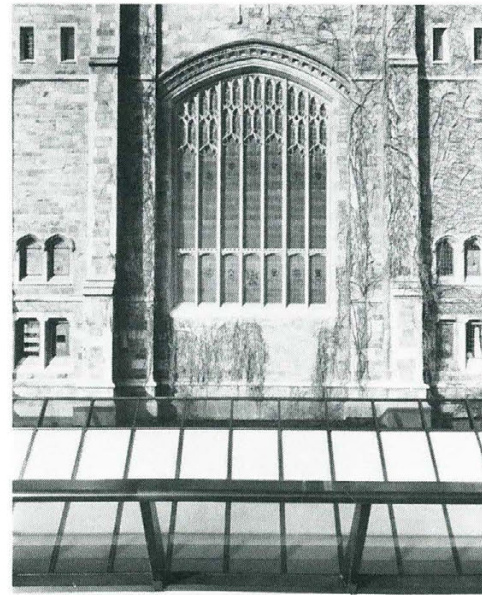


Confronted by the need to expand its library, the law school at the University of Michigan and its architect, Gunnar Birkerts, decided to go underground. The decision followed a precedent set by some other universities that, like Michigan, wanted to preserve open space above ground. Early efforts to raise a building on this site were rejected, Birkerts reports, when it became evident that such a structure would hide the Gothic presence of the existing library and impede visual and pedestrian access to the cherished Law Quadrangle formed by the older library and dormitories.

Birkerts seized the underground assignment as a chance to create an unmistakable work of architecture rather than simply to ameliorate the lot of enforced troglodytes with interior decoration. Deprived of all the familiar external tools of architectural design—massing, facade, structural expression—he turned for help to an old friend: daylight.

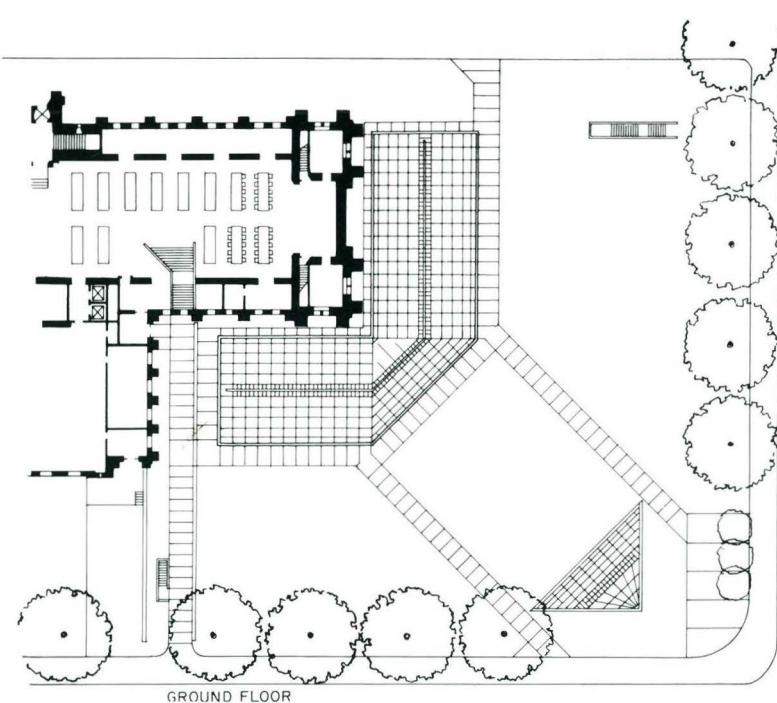
Merely widening windows to streaming sunlight has never satisfied Birkerts's ambitions. He sees daylight as a material—a material to be manipulated for use and beauty. In recent years he has become increasingly caught up by ways to diffuse, reflect and refract light. (See the IBM offices in Southfield, Michigan, in the October 1979 issue of *ARCHITECTURAL RECORD*, the Duluth Public Library in November 1980, and the Corning Museum of Glass in February 1981.) The current passion for daylighting as a passive use of solar energy and a conservation measure is all very well and an additional advantage to this design. But the real point of daylight to Birkerts is that it shapes architecture.

The Ann Arbor library draws sunshine, both direct and diffuse, down to the bottom of a three-story building. At the same time,

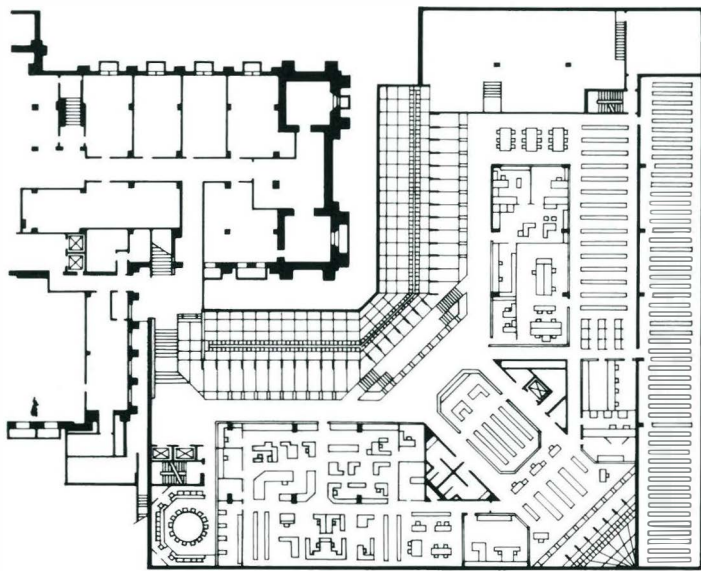


readers can raise their eyes from their books to see the reflected richness of indoors, outdoors and themselves. Birkerts declares his intention of going underground without degrading the building's users, who can sit or move about in the space with no oppressive sense of burial in a remote subbasement. The

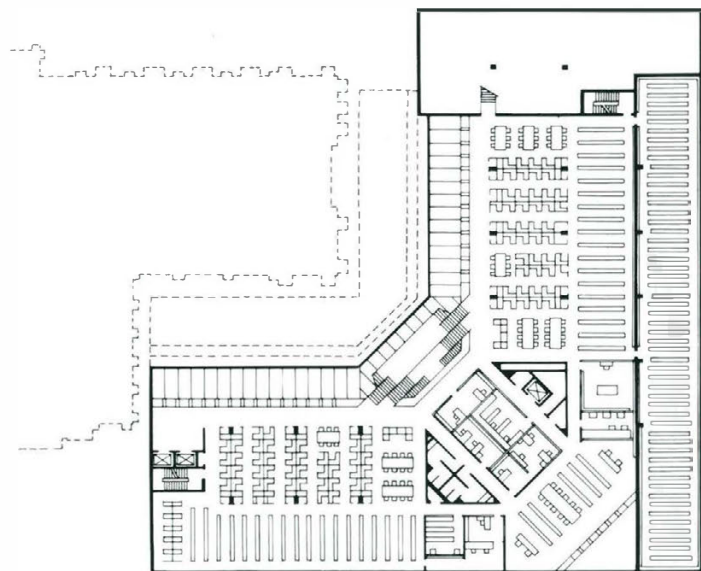




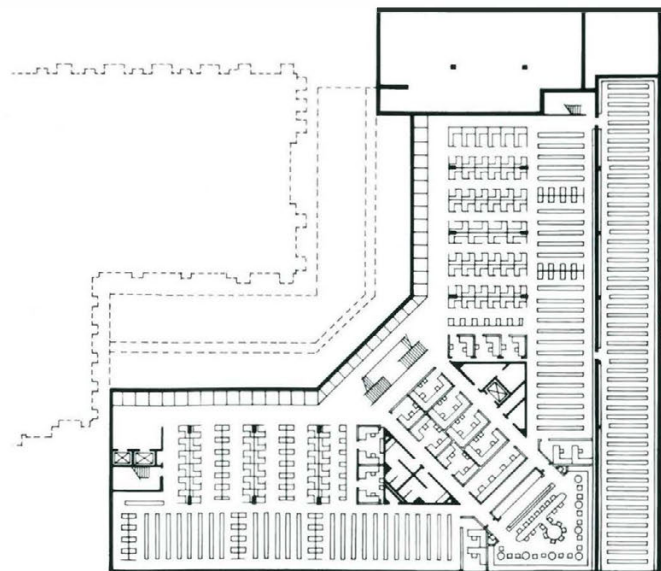
GROUND FLOOR



FIRST LOWER FLOOR



SECOND LOWER FLOOR



THIRD LOWER FLOOR

eye, ranging the balconies around the skylight or glancing up to trees and clouds, can encompass distances that would be generous in any building.

The key to underground daylighting here lies in a pair of penetrations through the roof. The larger is an L-shaped trench defining the inside corner of the new library and wrapping around the base of the old. The limestone panels that face one sloping wall bounce light through the reflective glass opposite. The trench itself goes down only one story, but the slanted limestone extends all the way to the bottom of the building (see section on preceding page). This surface is in effect the workhorse of daylight distribution, its texture diffusing illumination received from the skylight deep into areas on both legs of the L. More important psychologically, the bright sunlit expanse is visible to anyone sitting or standing well inside the building.

Of equal importance psychologically, a smaller triangular well provides backlighting in the underground space. Even along the back walls, if no partition interferes, one is conscious of daylight in the corner and in the lounge at the bottom of the well.

The long skylight does more than merely admit daylight. Birkerts has used it for the kind of visual fun and games that can turn functional shelter into architecture. A deceptively simple device—yard-deep mirrors set perpendicular to mullions—creates a long row of “stained glass windows” that capture colorful and changing images of foliage, sky and the Gothic details of the “mother building.” The architect cunningly devised this fractured and kaleidoscopic ornament to beguile and tranquilize “pragmatic minds” preoccupied by law texts.

Functionally, the mirror-mullions operate as baffles to reduce the amount of direct sunlight and glare entering the space. In this guise, the mirrors add another decorative

dimension—a plaid pattern formed as direct and reflected light and shadow meet on the limestone slope (see next page).

After sunset, the trenches come close to being external architecture. Cove lighting at the edges of the balconies shines through the glass to glow on the limestone panels and





Reading desks set on stair railings take advantage of diffuse daylight from sloping glass (opposite). Skylight and mirrored baffles admit and reflect light to the bottom floor (directly above). The mirrors reflect outside views as well as viewers themselves (at top above).

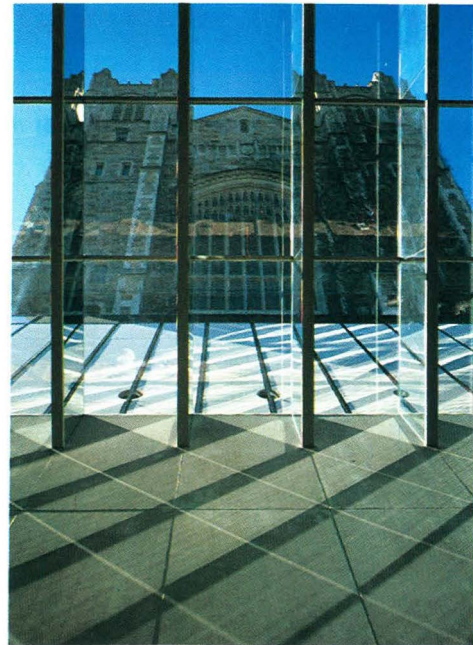
illuminate a fanlight at one end. At those hours, rather mysterious moats of light surround the old Gothic building.

Quite apart from the relief of the psychological pressures engendered by an underground building and the visual entrapment of pragmatic minds, however, the building is first of all a working library—and few libraries work harder than those of law schools. The addition is intended for the use of students; other scholars and guests will use the old library above, which also becomes the main entrance to the new.

Students are each assigned a carrel provided with cabinets for sustained projects and already wired for the video display terminals that librarians expect will shortly be needed. Many of the students, however, regularly use the daylit reading desks on balcony railings, though Birkerts meant these chiefly for brief reference stops; the seats are in fact only armless stools, but the resilience of youth and the luxuriousness of light and interesting things to look at clearly outweigh lack of creature comfort. Ranking just behind the railing as choice space, the diagonal axis that connects the inside corners of the L offers occupants daylight at either end. The space is used for circulation desks, administrative offices, and casual lounges.

The 77,000-square-foot building can accommodate 180,000 volumes in finished space, another 200,000 to 300,000 volumes in unfinished space. The new library cost \$9.5 million, all private money contributed by law school alumni and other donors.

UNIVERSITY OF MICHIGAN LAW LIBRARY ADDITION, Ann Arbor. Architect: *Gunnar Birkerts and Associates—Kenneth Rohlfing*, project director;



Barbara Bos, Mary Jane Dines, Charles Fleckenstein, Anthony Cholz and Kenneth Kemp, project team. Engineers: *Robert Darvas Associates, P. C.* (structural); *Joseph R. Loring & Associates, Inc.* (mechanical/electrical). Consultants: *Wolf & Company* (cost); *Construction Consultants, Inc.* (waterproofing). General contractor: *J. A. Fredman, Inc.*





The predominant—indeed the only readily recognizable—architectural element at the University of Michigan's law library addition is a grand staircase that connects all three floors at the corner hinging the two underground ells. The stairs combine with balconies overlooking the long lightwell to form the building's major circulation route (opposite). Visitors enter first from the old Gothicized library via a broad but discreet stairway. ("It hurt to make an incision in the old building," Birkerts says of the surgery required to connect the two libraries.) The structural variations composed for the descending stairway are described by engineer Kenneth Winters: "The top run is suspended from two cantilevered sections of the floor slab, 68 feet from end to end, to an intermediate landing. The next run is an arch between two cantilevered sections of the middle floor slab, 58 feet from end to end. The next run is again suspended, 48 feet from end to end, with the lowest run acting as an arch, 30 feet from end to end."

Waffle-plate floor slabs, in addition to supporting a live load of 150 psf, and the roof slab, in addition to supporting 3 to 6 feet of soil, act as diaphragms to resist lateral earth loads in the two outside walls. The sloping light well is supported by vertical concrete piles, built adjacent to each other to effect a retaining wall and stabilized with prestressed concrete tie-backs extended into earth below the old building. Concrete planks behind the limestone facing were backfilled with a sand-cement mixture, and a lead membrane provides waterproofing.

At the entry to the new library, glass display cases are embedded flush with red oak railing (upper right).

