

## The Beinecke Siamese Twins:

An Objective Review of Yale's New Rare Book Library Building.<sup>1</sup>

*In several respects Yale's Beinecke library lacked the benefits of the best planning procedures. Although the site was esthetically a difficult one to fill, the building does so quite well. The exhibition portion of the building which rises above ground level, the reading room, and the sunken sculpture court succeed nicely in accomplishing their respective functions. All, however, is not as clearly conceived in the much larger library section below grade. Access is not good; some of the lighting is poor; the impression made by the technical services area is harsh. Some of these difficulties could have been eliminated if better communication existed between architects and librarians.*

ANYONE would be morally offended to read the review of a book by the author himself, but we accept without question the account of a new library building by the librarian who planned it, the very person totally unequipped to give it any objective review. For he has moved out of a rat's nest into spacious quarters, which would seem grand no matter what they were, he is under heavy pressure from his university to get this prime piece of public relations on the road, there often is a kindly donor of the building pleased as punch in the background, and the building itself is the librarian's baby. Consequently, the effervescent flow of bland reviews of buildings (just run through an architectural issue of *LJ*), all of which say that they incorporate in the highest possible degree all the successful elements, described in cliches, of the totally good building.

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The simple fact is that only a few good academic library buildings have been built since the war, and many of these are defective in important aspects, such as lighting. This article aspires to inaugurate a series of objective reviews of the most important recent academic library buildings, which should be written by consultants completely unconnected with them.<sup>2</sup> The purpose of such

<sup>1</sup> This review has involved an analysis of the published accounts of the building, prolonged study of final floor and furniture layout plans, interviews with Richard Kates of Jaros, Baum, and Bolles (the building's mechanical engineers), and Morris Zerkowitz (team captain on this job for Skidmore, Owings, and Merrill). In addition I spent two days in New Haven for a careful study of the building's details, and extensive conversation with Herman Liebert (librarian of the Beinecke library), John Ottemiller (Yale's associate university librarian), and Kenneth Nesheim (assistant librarian of the Beinecke library). I thank all these men for their patient answers to my probing. They may not be surprised to know that their information did not always jibe, and that I have had to evaluate the evidence available.

<sup>2</sup> The Beinecke rare book and manuscript library was chosen for its inherent significance as a model, and because the writer became conversant with the Skidmore, Owings, and Merrill style while planning the Colorado College library with their Chicago office. The main features of the Colorado College library are clearly related to those of the Beinecke library, although Walter Netsch of the Chicago office stoutly denies it.

articles should be to delineate the character of each building sensitively, pro and con, and conclude what we can learn to use and not to use from it.

#### THE PLANNING

The Beinecke library was not planned under the best of circumstances. It had an open-ended budget, with no firm upper limit of expenditure stated to the architects. This is a situation tailored for Skidmore, Owings, and Merrill, whose New York office is noted for expensive architecture, and it is exactly the same kind of financial situation that called forth the architectural extravagances of Yale's Sterling memorial library at the end of the '20s, while Rome burned. It led directly to some of this building's flaws, and better results could have been achieved by setting a large but firm budget.

In the second place, the librarian of the Beinecke library had not been appointed when the planning began, and was not appointed for about six months thereafter. This placed Herman Liebert, the logical candidate and the man who knew the dynamics of the operation, in a tangential position, whereas he should have been in a more central position of strength and authority from the beginning.

In the third place, there was no detailed program for the building. The Beinecke library was a radical departure for Yale in that it fused, for the first time, its special collections, each of which has its own curator, with the rare book room. Yet the components of this building were not defined in detail and the dynamics of the operation it would house were not completely delineated in a written program before the project was handed to the architects. As a result the present dynamics of the Beinecke library have been, to a certain extent, determined by Skidmore, Owings, and Merrill, which is not entirely to the good, as will be seen.

Finally, the University should have used a library building consultant, and a lighting consultant in the planning. John Ottemiller was central in the university's negotiations with the architects, and there is no question that he was responsible for some fine things in the building. But in negotiating with an architectural firm that has an unshakeable reputation for dictating to its clients, a library building consultant of broad experience would have helped considerably, and he certainly would have insisted on a written program.<sup>3</sup>

The lighting shortcomings in this building, where they occur, are naive and predictable. Yale had on the faculty of its school of drama one of the greatest experts on lighting in the country, Stanley McCandless, but he was not consulted on the lighting plans of this building, or any of the recent Yale buildings.<sup>4</sup>

#### THE SITE

The Beinecke library was built on the southwest corner of Hewitt Quadrangle, on the last piece of uncommitted ground at the center of the University. On the northwest corner of the quadrangle, with its back to Beinecke, is a small, heavy, windowless imitation Greek temple built of white marble blocks, now considerably weathered. On the far side of the

<sup>3</sup> There is a tendency at Yale to think of written programs and library building consultants as inflexible elements that hamper creative architects and produce unsuccessful buildings, rather than indispensable guides through a dark wood. My own experience indicates that library buildings fail most often because architects have a tendency to conceive of (as they talk of) buildings as spatial sculptures rather than spatial functions, and this often leads to building from the outside in, despite pious protestations to the contrary. It's a rare architect who knows how a library works, and the best buildings have resulted from a strong interaction between the special talents of the librarian and the special talents of the architect. On this job the imbalance was much too heavily in favor of SOM.

<sup>4</sup> The stack lighting in the library section of the new Yale art school, half a block from McCandless' office, designed by Paul Rudolph, is simply incredible. It is formed of incandescent spotlight bulbs screwed into exposed conduit runs mounted slightly above head height in the middle of the aisles. The resultant glare is eye-shattering, and the heat is immediately disturbing even on a cool day. The arrogant disdain of architects for the basic principles of good lighting would require a four-volume commentary.

building are large bronze doors. Both the marble and the bronze carried over to the Beinecke library.<sup>5</sup>

Just east of this building is the University Commons, an enormous rectangular structure that flanks the entire northside of the quadrangle with a portico behind a dozen huge Corinthian columns, whose acanthus leaves on their capitals are discreetly covered with chicken wire, to avert the pigeon scat (the wire is not visible from the south entrance of Beinecke).

On the northeast corner is Memorial Hall, a rotunda whose copper dome, heavily green with sulfation, looms high over the quadrangle. Running south at right angles from Memorial is Yale's largest auditorium, Woolsey Hall, a limestone building pierced on the face opposite Beinecke with five huge Romanesque windows. On the southeast corner of the quadrangle is Woodbridge Hall, the administration building, a smaller, squat, two-story limestone building.

Across the street south of the Beinecke library is Berkeley College, a residence hall in cottage Gothic style, of light brown fieldstone, whose five stories incorporate feeble attempts at buttresses, parapets, and leaded windows, to conform to academic respectability in the early '30s. Just across the street west of Beinecke is a facade of the law school, whose light brown fieldstone lower level is topped by a red brick inset wall pierced, between buttresses, with elaborately ornate Gothic windows that culminate above in a series of knobbed shafts and two gingerbread Gothic towers at the ends of the building.

And across the street, on the diagonal to the southwest, is Sterling memorial library, whose window-slotted, buttressed stack rises thirteen stories to a series of medieval towers (the nearest topped by a weathercock), and whose

awesome Gothic mass could be ignored only with peril.

Commons and Woolsey Hall, which dominate the quadrangle, are strong buildings, with a feeling of quiet dignity enhanced by the names of great World War I battles incised in the frieze, a fifteen-foot high cenotaph to that war's dead in front of the portico, and a forty-foot memorial flagpole of painted bronze. Into these grounds an interloper dared not enter lightly. The 200' x 350' quadrangle between the buildings was paved entirely with cobblestones, roundly cursed in slippery weather by generations of students, since this is one of the main walkways between dormitories and classrooms.<sup>6</sup>

For an architect who works in a modern style, the site could not have been more incongruous, but the most obvious thing about the building at first glance is that it has coped with the site problem brilliantly, and Hewitt Quadrangle has never looked so good. The building had to be oriented north-south, and the size of its head (that portion visible above the quadrangle, which is less than half of the building) has been held to the right proportions to balance nicely the other buildings in the quadrangle, both in its height and its facade.

The use of marble facings and the simplicity of its form provide enough suggestion of the classical style to make it consonant with the buildings on the quadrangle, while the sharply cut, grey granite frames around the marble, which rise to a pointed boss where the frames meet, provide strong jagged lines across the face of the building and at its corners that relate it to the surrounding Gothic. In addition, the provision of a sunken court has added interest to the quad-

<sup>6</sup> There is an excellent photograph of the building in its eclectic setting on page [122] of the April 1964, *Yale University Library Gazette* (XXXVIII, 4), which can be found in any substantial library or bought from the Beinecke library for seventy-five cents. The same photograph, less successfully reproduced, appears on page 140 of the June 1964, *Architectural Record* (CXXXV, 7).

<sup>5</sup> The decision to use marble came late in the building's development, after Gordon Bunshaft's global search for onyx slabs of the proper size failed.

range, which has been raised to sidewalk level and paved entirely to the edge of every building with the same warm grey granite used in the Beinecke library facing frames, with the result that the whole quadrangle is brought together in an unusual way.<sup>7</sup> And there is no question that the building sustains the memorial tone of the quadrangle.

#### THE CONCEPT

As indicated, the architects were restricted by the existing quadrangle in how large a building they could mass at this location, and the Beinecke library runs to something like 112,000 square feet.<sup>8</sup> They also faced the problem of excluding sun from the building, to protect fine books. This is difficult to do if any windows are used at all, but the mass of a building is exaggerated if it lacks windows. In addition, they had to provide delicate temperature and humidity controls for preservation of the books, which are extremely difficult to maintain in a building with exposed walls. Both the window and the control problems could best be solved by burying the library, and this they did; the library proper is entirely under ground.

They also planned a second building, connected to the library by stairways, which is not a library at all but a grand and elaborate exhibition case faced with marble, with a glass wall on the main level, inset under the head far enough so that the sun never gets in, and a fifty-foot ceiling. This is the building visible above ground. It does its job in

a remarkably impressive way, as is shown by the usual photographs of the interior of the head.<sup>9</sup> Entering from the east through a revolving door, which is required at times, you are confronted with a glass-enclosed vault 35' x 60' that rises six stories in the center of the building on tier-built stacks until it touches and helps to support the roof. Facing out in a hollow square of stacks on all six levels, on all four sides of the vault, is a major part of Yale's rare book collection, an admirable sight.

The books are lighted on each level by small incandescent lights on the ceiling edge of the glass wall, shielded from the public so that the lighted books command the view. The surrounding area is lit by down-lights mounted in the ceiling some forty feet above the mezzanine level, and these are kept deliberately low so that, in contrast with its gentle gloom, the vault is more spectacularly dramatic. Downstairs on the main floor, where some daylight comes in through the glass wall, are very long flat exhibition cases flanking the vault on the north and south. The main floor is granite.

The vault can be approached from a mezzanine level ten feet above the main floor, separated from it by a three-foot gap. At the head of the stairs leading up north and south are large upright bookcases, brilliantly lit, with a curved glass front, and from the north and south entrances on the main floor, they give the illusion of presenting books out in the open—real rare books—which gave me a great feeling of warmth when I first entered the building last February.

Against the east and west walls of the mezzanine are a row of nine specially designed bronze exhibition cases (which will be discussed later) containing on long-term exhibition some of the greatest rarities in manuscript and print of the eastern and western world. Again, the

<sup>7</sup> In a prime example of abstract expressionism in words, which we could do without in architectural criticism, Vincent Scully states, "All these surrounding buildings are effectively swept out of existence by the Beinecke rare book library . . ." (*Saturday Review*, May 23, 1964, page 28). Exactly the opposite is true; the quadrangle now feels close-knit.

<sup>8</sup> This figure was supplied by Mr. Zelkowitz, but in the Beinecke library most of the computations generally applied to the comparison of buildings have no meaning. Square footage is one of them, because although the square footage of the head is small, its fifty-foot ceiling makes the corresponding cubic footage enormous.

<sup>9</sup> See the photograph on p. [145] of the April 1964, *Yale University Library Gazette*.

bright light of the cases divides the dark air (Dante's phrase, and Joyce's), and strikes through their glass backs to the marble facing panels framed in granite, which, at a distance of four feet, are quite magnificent.

These panels are of white Montclair Danby marble with a soft drift of gray running through it in streaks on the diagonal, a beautiful stone cut with rare craftsmanship. The panels are hexagonalized, the lines pulling out slightly to a point from what would otherwise be a square face, measuring eight feet eight inches from point to point, in both directions. These are framed in warm grey granite crosses, which taper out from the boss to the end of the arms, raise to a high point at the boss, and are cut on a sharp angle from the center to the edge of the arm.<sup>10</sup> Measuring eight feet eight inches in both directions, they are so arranged that each panel is held in place by two arms of each of four crosses. Up close, this arrangement is most impressive. When the sun strikes the panels from the outside, the marble glows a warm brown yellow, and the grey streaks dark brown. This effect is most spectacular at a distance, from the main floor.

On the mezzanine are two large bronze cases specially designed to exhibit permanently the Gutenberg Bible and an elephant folio Audubon. On the north and south ends of the mezzanine are carpeted lounge areas with chairs and divans, and an eight-foot diameter single-pedestal table of Italian burl'd olive, its dark beauty completely lost in the dim light.<sup>11</sup> The ceiling is coffered, with a dark spot in the center (which is actually its light) and a dark relief

around the edge through which the ventilation is supplied. But the ceiling and the seating areas are not very noticeable. The central glass vault holds the center of attention, with the exhibition cases against the walls as satellites, and behind these cases the grandeur of the marble facings and granite frames.

This entire building, as I have stated, is an exhibition case, magnificent in a style that would have pleased Lorenzo, brilliantly original, and most striking outside and in. The architects have reason to be pleased with their creation. It is by no means clear, however, that the University entirely approves of it, because by its very nature it sets major policy that is not completely in accord with the academic and library community and the general tone of the Yale campus. It is a showcase, a prime piece of public relations, a bijou in a bowl, to be visited by the curious and the idle whether or not they are interested in books or things of the mind. In short, a kind of bibliographical zoo, with the prime animals eternally on show, no matter how tired they may get, and no matter how their keepers may fret. Against this should be stated that the excellent and commodious long exhibition cases on the main floor are designed for exhibitions to coordinate with the instruction of courses in the undergraduate schools, that there is some hope that a few of the throngs who come to peer will be touched, and that the impressive style of the entire building may well lead collectors to choose this library to house their treasures. While this building leaves many unhappy, the architects' concept of the exhibition head and the buried library is clearly defensible.

#### THE LIBRARY

While the exhibition head measures 88' x 131' at its outer walls, the library proper measures 188' x 160' and is comprised of two high-ceilinged stories, flanked on the south side by a three-tier

<sup>10</sup> These crosses are derived from those in the screen wall of the Banque Lambert, Brussels, designed by Skidmore, Owings and Merrill in precast concrete.

<sup>11</sup> I brought back a flashlight to look at it. This wood is richly magnificent in both grain and color, and it is a pity that the two desks made of it, in other parts of the library where they can be seen, are covered with plate glass to avoid scratches, which effectively destroys their beauty.

stack.<sup>12</sup> It is therefore much more than twice as large as the building above, and its mass has been skillfully concealed by burying it.

Unfortunately, it is connected to the upper building in a way that makes it impossible to control incoming traffic (and sightseers are not invited here). The stairs begin about eight feet inside of the north and south entrances and at just a slight angle to them, so they have a tendency to draw people down, to land through glass doors about half way between a twenty-seven foot long circulation desk (generally manned by one attendant) and the reading room. It is possible to come out of the stairway fifteen feet from the desk, take a quick turn to the left or right, and be shielded from view by the staircase to go meddling down the corridor into the curators' offices, which are often open, empty, and full of treasures. While I am sure that people inspecting the Saarinen hockey rink also cause difficulties, this arrangement is especially distasteful to bibliophiles, who insist that rare book libraries are for scholars, and rare book librarians should not have to pop up and down as inspectors. It is impossible to keep the casual or the curious from coming down to this level, which surely could have been planned if the building had been programmed.

This floor, which is carpeted in a pleasant textured apricot color,<sup>13</sup> is divided into two areas by the lobby at the foot of the stairs. To the west are a card catalog room, the processing room (behind the circulation desk), and a utilitarian cluster composed of a coat-hanger-corridor, rest rooms, lounge, and kitchen.

<sup>12</sup> A large L-shaped expansion area was built under the quadrangle as a shell large enough to contain triple stack-tiers on the north and west sides of the Beinecke library proper, for the law school library, which is connected to this area by a tunnel, but it was not in the Beinecke budget and is not included in these measurements. I should mention that the Beinecke library is also connected to the Sterling memorial library by a tunnel.

<sup>13</sup> All right, you describe that color.

The card catalog room is pleasantly panelled in teak, with teak bookshelves on all walls holding the reference collection. The catalogs are teak, with ebonized drawer faces and bronze drawer pulls and bases. The wall edges and the bookcase sections are set off by dark inset relief strips, a hallmark of SOM. The feeling is one of dignified, handsome, lavish simplicity.<sup>14</sup> The eight-and-a-half foot ceiling is mounted with downlights, which at this height are unpleasant and offend the eye in certain locations at the tables. They are hot, even with air conditioning, and only supply thirty to fifty foot-candles of illumination.

This room connects, through a small corridor, with the technical processing room, which lies behind the circulation desk, and is a commodious but unpleasant room. There is a generous amount of shelving on the walls, room for a dozen standard desks, four large tables, a sink, wall-built bars, and the like, but the room's 1,650 square feet of floor space, completely internal, unrelieved in any way, is the only part of this floor left uncarpeted (except the small kitchen and the rest rooms). This parsimony in a palace not only deprives the room of a pleasant feeling of comfort, but the light tile floor also compounds the eye-blinding glare of the lighting, which is very intense but of very poor quality. The glare from the ceiling and floor reverberates from the white walls behind the stacks, which, for the most part, are not filled with books.

Built into the corner of this room, immediately behind the circulation desk, is the assistant librarian's office, which involves the same difficulties of feeling, for similar reasons, as the processing room. But it is not so intense because the room is smaller, and the librarian who occupies it keeps the lighting at its lowest intensity and supplements it with

<sup>14</sup> There is a photograph of this room on p. [147] of the April 1964 *Yale University Library Gazette*.

a desk lamp (though the overhead lights can produce 120 foot-candles). On the east wall is a huge white enamel panel filled with impressive dials, which indicate undue changes in humidity and temperature in all zones of the library, the opening of doors, and fire hazard, by flashing red lights. A much more complex and sensitive panel board in the mechanical area downstairs, which records the conditions in every zone of the library, is the basis for action by the maintenance crew.<sup>15</sup>

The other half of this floor, to the east of the stairs in the lobby, is composed of the reading room and the curators' offices, which look out from a hollow square through glass walls into the sculpture court. The reading room is completely successful in feeling. Thirty-six by seventy-eight feet, its size is disguised by the glass walls that enclose it on both of the long sides. It is carpeted, and contains a dozen four-by-six reading tables, each equipped with adjustable book stands over which are laid two flexible cloth tube weights (filled with lead shot), the most practical device ever invented for keeping a book open. The tables are handsome in teak. The four surrounding chairs (Thonet, designed by Marcel Breuer) covered in black naugahyde, with chrome frames, match them well.<sup>16</sup> On the end walls are six 30" x 72" tables with slanted tops, with a single chair at each. At each end of the central seating group are low, marble-topped bookcases 26' long, which

are quite handsome, if not of much use.

The lighting in this room is as excellent as that in the processing room is bad, and a comparison of the two throws a great deal of evidence on what makes for good quality in lighting. Except for the edges of the room, which are mounted (I can't say lit) with downlights, this room has a luminous ceiling, which is to say that it is almost completely covered with light. Illumination is provided by a combination of fluorescent and incandescent lights above a milk plastic sheet diffuser, and while milk plastic diffusers of considerable size are quite offensive to the eye, these are covered with an egg-crate louver composed of 6" squares 4" deep, made of teak, which is quite handsome and puts the plastic out of sight. The lighting in this room is about 120 foot-candles, but of very high quality, and habitués of the room informed me that it does not tire the eyes during an all-day session. Through the inner glass wall is the sculpture court, and a more pleasant and useful reading room would be hard to find.<sup>17</sup> Its one defect is that the feeling is achieved partly at the expense of the security of the materials used in the room.

After proper identification at the circulation desk, the reader is instructed to put his coat and briefcase, everything except his immediate working materials, in the coatroom-corridor near the desk, and the book is then brought for him from the stacks by a page. He is then directed to use it in the reading room, whose entrance is straight across from the circulation desk, at a distance of twenty feet, and in the far corner of the room he can be seventy feet away from the circulation librarian. The use of pens

<sup>15</sup> Even in the mechanical room of the Beinecke rare book and manuscript library, the panel board should not spell Gutenberg with two "t"s, which it does.

<sup>16</sup> A study of this building shows the limitations of two materials. Teak is at its best in small pieces. These tables, and the teak desks used in the offices, are quite handsome, but the mass in which it is used in the card catalog room makes it appear a little weak (although that room on the whole is pleasant). On the other hand, polished chrome goes well with such textures as plastic, but is aggressive and hard when used in the frames of the teak desks. None of the commonly used metals—polished chrome, brushed chrome, aluminum, or stainless steel—goes really well with a wide variety of excellent surface textures now available in furnishings, and it is often preferable to use enameled steel in a harmonious color.

<sup>17</sup> A photograph of this room is in the April 1964 *Yale University Library Gazette*, p. [146]. With the irony that invades human affairs, the students who use this library are so highly motivated that they would wade through seas of blood to reach its treasures, and do not need to be lured in. Given the Yale collections, the occupancy of this room would probably be the same if it were furnished with bales of gunny sacks.

is prohibited, but this is a somewhat difficult restriction to enforce at this distance. If the reader is bent on mutilation and feels inhibited by the glass walls and the glass panels that look into the room from the librarian's office and the conference room on the south wall, he can go into the small typing or microfilm reading rooms that open off the north end of the reading room and slash in a corner completely protected by a solid wall.

In addition to the typing room at the north end, there is a microfilm reading room, each containing five stations. A means has not yet been devised for holding typing copy, particularly large and heavy books, in the proper location for copying and yet close enough to the typewriter so that it is easy to read copy. The special bars in this room are no more or less successful than most others. While one of these rooms calls for darkness and the other for very good light, the lighting is the same in both rooms—very poor. The ceilings contain down-lights, which seem to be a disease with architects, and the intensity at the typing desks ranges from thirty to forty foot-candles of very poor quality light, in this case not due to glare but to lack of diffusion and too few fixtures.<sup>18</sup>

The other three sides of the sculpture court contain two secretarial alcoves, which open directly (without a wall) into the corridor, the curators' offices, and three seminar rooms, one of which has been assigned to their Hinman col-

lating machine. All of these rooms are pleasant, handsomely furnished, and poorly lit with down-lights.<sup>19</sup> In two rooms, a column lands in an awkward location, and unfortunately one of these is the office of the librarian. The court which opens to the sky, is deep enough so that sun is not a problem, and the window walls are equipped with louver-curtains that pivot closed, and draw aside when not in use. Those who have worked in an office with a window wall know how very pleasant it feels.

The corridor surrounding the offices is lit with down-lights, which make no particular difference here. They paint the ceiling pleasantly with a row of light circles and give enough illumination for walking. At the extreme east of this floor is a wall 116' long covered with glass-enclosed teak bookshelves which are good looking, very convenient, and extremely useful to the curators.<sup>20</sup>

#### THE SCULPTURE COURT

The court serves as a light well for those working on the library floor (except the processing staff), and contributes to the pleasant feeling that prevails on this floor.<sup>21</sup> Isamu Noguchi designed the court, which is paved with white Imperial Danby marble edged with a granite curb. The paving is cut by a pleasing design of arcs and partial circles which move out from three large, geometrically designed sculptured forms of the same marble—"a 'Sun' symbolizing

<sup>18</sup> A photograph of a curator's office, shot through the window wall, appears on p. [148] of the April 1964 *Yale University Library Gazette*.

<sup>19</sup> The teak shelves in these cases and in the card catalog room are hung on round metal pegs slipped into holes drilled into the siding. This ancient device has been updated in the twentieth century by equipping the peg with screw threads, thereby increasing its efficiency in gouging out the siding. Already, six months after installation, these pegs when removed drop loose sawdust. After twenty years, especially at heavily loaded shelves, railroad spikes can be slipped into the holes. Since adjustable strip shelf hangers are now available with wooden covers that conceal the metal almost entirely, this is inexcusable.

<sup>21</sup> Sterling memorial library has two such light wells, one of them in a lovely court, which are probably the ancestors of the sculpture court.

<sup>15</sup> Down-lights are round, incandescent lights mounted flush or slightly recessed in the ceiling. They sometimes have a lens (these do) and sometimes an ornamental grill. Architects love them, because they think they are romantic, like little stars in the sky. To get this effect, they have to be distributed wide apart, and although they are not spotlights, they throw a cone of light that covers no greater an area than a spotlight. To get any good coverage in a room, the ceiling must be saturated with them, and even then, they do not diffuse light evenly. When architects are afflicted with downlights, which is often, they use them to paint with, not to illuminate, to twinkle or "punch holes through the air," as one put it to me. So we get twinkles and punches, but no good light, and they throw horrible face shadows.



cosmic energy, a 'Pyramid' symbolizing the geometry of the earth, and a 'Cube' symbolizing chance."<sup>22</sup> The symbolism is by no means imbedded in these forms, but they nevertheless are pleasingly intellectual, simple, and geometrical, thus harmonizing nicely with the feeling of the head. The architects have said that they avoided landscaping to prevent the retention of water that might seep into the stacks directly below the court, but since the ceiling of these stacks had to be penetrated in three places to provide water run-off from the curb drains and to provide a separate column to support the twelve-ton weight of Noguchi's Sun, we wonder if the hazard is not as great.

#### THE STACKS

Viewed from the east in cross-section, this underground building is composed of a south three-floor tier-built stack separated by an internal wall from a north two-floor unit comprising the library floor and the stack directly below it, which has an 11' ceiling and is separated into three sections by cement brick walls and fireproof doors. This juxtaposition of two and three stories violates the AIA-ALA award committee's remarks about the "pristine simplicity" of this building and makes for awkward movement from the circulation desk to the tier-built stacks. In a rare book library that does not receive heavy use, this is no great drawback.

Burying the stacks simplified most of the problems of protecting the books from hazards. It immediately eliminated danger from hurricanes and lightning, and made the problem of heat and humidity control much easier.<sup>23</sup> In addi-

tion, it simplified the construction problem by placing all the weight of the books on the floor slab, instead of on weight-bearing floors.

The fire control problem is no easier in this building than in an above-ground building, but it has been solved in an interesting way, by providing a Cardox system for flooding each of five zones with carbon dioxide on call from sensitive heat and smoke detection units placed throughout the stacks. When the units signal, a bell rings as warning to clear the stacks, and the system then prepares to discharge. As soon as someone presses a release button, the zone is sent a charge of carbon dioxide, heavy enough to prevent combustion, from a great tank in the mechanical area, where it is stored under heavy pressure.

The system contains enough carbon dioxide to provide two full charges (presumably they would be in two different zones), and still have enough gas left for a couple of small charges. While the manufacturers designed the system to release the charge automatically two minutes after the bell rings, the Yale authorities have wisely bypassed the automatic discharge, because they know that people in a hurry sometimes trip, and that the ice crystals formed in a CO<sub>2</sub> discharge would harm the books when they melt. The system therefore will be discharged only after a human agent has looked to see that the stacks are clear and the fire large enough to require it.

The one hazard that has probably been increased by placing the stacks underground is the moisture problem,

to within 2° of this temperature and 5 per cent of this humidity, but I have long since come to doubt the claims of ventilation engineers, because I have never seen any modern building that is uniformly comfortable in warm, cold, and intermediate weather. All areas of the stacks in the Beinecke library, including the glass vault, feel good as you pass through them, and if the engineers can hold to within 8° of the temperature, and 10 per cent of the humidity the books will be more than well preserved. The elaborate dial recordings of conditions in each of the building's zones should make safeguarding the books an easy, if constant, task.

<sup>22</sup> *Yale University Library Gazette*, April 1964, p. 129. The old grads have wielded their heavy-handed irony on the Noguchi sculptures in the correspondence columns of the *Yale Alumni Magazine*.

<sup>23</sup> It would have been necessary to provide heavy insulation on the outer walls if they had been above ground, to prevent dripping at 50 per cent humidity in a New England winter. The stacks, both here and in the glass vault, are kept at a constant 70° temperature and 50 per cent humidity. The mechanical engineers claim that they can hold the system

although there is also danger of wall or roof leakage in a building above ground.<sup>24</sup> This building has to worry about moisture coming through from the plaza and the sculpture court. It is impossible to treat concrete in any way that will make it completely waterproof. The waterproofing depends on covering the concrete with waterproof membranes, and pouring a second layer over the membranes. About half of New York City lies under such construction, and a great deal of that half leaks a great deal of the time.

The Beinecke library contains the ideal solution to this problem, by interposing one floor that is not used for stacks between the surface through which the water might seep and the stacks. Presumably, it would always be possible to repair the leak before it ran through a second floor. Most of the stacks are protected in this way. But having the solution in hand, the architects rejected it by sinking the sculpture court above the basement stacks, and penetrating the stack ceiling, to run the court drains through it and to support the Noguchi Sun. While the best construction methods for waterproofing have been used, there is some risk involved. There is also risk involved in the fact that the top of the triple-tier stacks is directly below the plaza paving, and is constantly walked on. Presumably the dials recording changes in humidity would instantly alert the servicemen to any serious problem, but they would not record small leaks.

Remington Rand provided the stacks, which are 7' 6" high in the tier-built area, and 8' 6" high, which can easily take eight shelves a range, in the basement stack area. They are on 4' 4" centers, hanging 10" shelves above 24" bases, leaving an aisle of 28", which is adequate. John Ottemiller, whose long

experimentation with shelving in the Sterling memorial library is responsible for these stack arrangements, had Rem-Rand determine that the same gauge steel used in their standard three-foot shelves could be extended to 40" (which he stated is the outer limit) and still hold a shelf full of average-size books without bending, and these stacks use 40" shelves.<sup>25</sup> Unfortunately, the module size of the floor was changed on site, and some 30" shelves and some 28" shelves had to be used as well.

Except for the processing room and reading room, the rest of this building is lit by incandescent lights, despite the heavy load they place on air conditioning. In these stacks, which are entered rather infrequently, and where consequently the air-conditioning load would be comparatively light, the architects have used fluorescent lights. They produce very bad glare, but this is unimportant in a stack area where no browsing will take place. The fluorescent tubes have been fitted with plastic filter shields to minimize the deleterious effects of this light, but to safeguard the rare books completely, incandescent lights should have been used in the stack areas.<sup>26</sup>

#### THE VENTILATION

The ventilation system uses a rotating screen prefilter, electrostatic filters and activated charcoal filters (which remove noxious gases, including sulphur gases

<sup>25</sup> Ottemiller stated that this change saved the University about \$85,000 in stack costs (which sounds like a large figure). It is clear that we are now in a position to re-think every dimension of stacks—height, centers (we should really think about aisle width instead, which depends on the width of the bases), length of shelves, and depth of shelves for our libraries. If a library is to shelve three hundred thousand volumes or more, it probably will not increase the unit costs to depart from the standard height and length.

<sup>26</sup> For information on this subject, see Robert L. Feller, "The Deteriorating Effect of Light on Museum Objects," *Museum News*. Technical Supplement no. 3, June 1964 (supplement to XLII, 10, June 1964 issue of *Museum News*; *Journal of the American Association of Museums*), and Laurence S. Harrison, *Report on the Deteriorating Effects of Modern Light Sources* (New York: The Metropolitan Museum of Art, n.d.).

<sup>24</sup> I am informed by architects that it is impossible to build a roof that will not leak sooner or later, even if not subjected to unusual strain.

and ozone) to protect the books from air pollution. Both the air intake and exhaust are screened from view, embedded in the top of the wall south of the library, and the cooling tower for the air-conditioning system is skillfully located on top of the Commons building to the north, which is high enough to place it completely out of sight.

The ventilation of the head is unusual. A large volume of air has to be moved to maintain the temperature and humidity in this area, which is kept slightly different from that of the book vaults to accommodate people, yet is quite humid. The air comes down through a four-foot opening in the ceiling, 40' above the mezzanine floor, in great volume. Since it mixes with the room air before it reaches walking level, it must come in at a considerably different temperature than that desired on the mezzanine. Until the very late stages of planning, it was not definite what the facing of the building would be, since the architects were searching for suitable onyx to quarry. The mechanical engineers therefore planned the system for the hardest possible conditions, with the result that the air enters with such velocity that it sucks moisture from the air already in the room. To balance this, they have arranged to introduce humidity when it is needed through the peripheral vents on the mezzanine, which were originally designed to blow warm air up along the facings to prevent dripping in the winter. This is not an ideal arrangement for achieving humidity balance, and it would not have been necessary if an open-ended budget had not allowed the architects to hunt for suitable onyx, which, if found, would have increased the cost of the building inestimably. As it is, the humidity in this area is kept below 50 per cent in the winter (in contrast to the book storage areas) to avoid dripping, and only slight dripping has been observed on the upper facing panels, where it is not dangerous.

## THE ACOUSTICS

In the only area where it matters, the reading room in the library proper, the acoustics are quite good, quiet, without being dead, with a low ventilation sound in the background, and no lighting hum. Everything about this room is good. In the head, the architects are reported as having aimed to achieve "stonelike" acoustics, one would surmise to inspire awe, and it is difficult to see how they could have achieved otherwise.<sup>27</sup>

## THE CONSTRUCTION

Although the construction of the stack areas is extremely simple—poured concrete slab and walls, painted, with vinyl flooring; and the construction of the reading floor is conventional, that of the exhibition head is enormously interesting. Each of its walls, which measure on the longest sides 51' high by 130' long is a Vierendeel truss, composed of steel crosses welded together into a rigid framework.<sup>28</sup> This frame supports its own weight, the weight of most of the roof, the weight of the 1¼" thick marble facing slabs, and of the granite sheaths which cover the crosses (on the outside with cut granite, and on the inside with precast concrete sheaths into which has been ground the same granite until it matches in color). This is an expensive way to construct a wall, but it was absolutely necessary to achieve the amount of free space required inside.

The trusses are supported eight feet

<sup>27</sup> *Progressive Architecture*, XLII (December 1961), 156. It was surprising to discover in running through the many articles on this library that none of them, even in the most eminent architectural magazines, is completely accurate, and numbers of them are highly inaccurate. It is evident that these magazines push "news" for bulk, just as the daily newspapers do, with no great regard for accuracy, and the architects cooperate by making releases for public relations purposes. The result is a great body of literature, loaded with facts, that is undependable.

<sup>28</sup> Because of the enormous stress on the frame, the crosses were changed in the course of planning from preformed concrete to welded steel, and this building is a great achievement in welding. A photograph of the truss before being covered and infilled is on p. [171] of the *Yale University Library Gazette* for April 1964.

above the plaza at all four corners on oilite bronze bearing plates that rest on steel columns embedded in concrete piers that go straight down through the building to bedrock below the foundation. The whole has been described by the architects as a "big box sitting on four points,"<sup>29</sup> the most interesting and elegant box you are likely to see.

The quality of the building's construction, by the George A. Fuller Company of New York, is remarkably high, due partly to the fact that one of the Beinecke brothers is a director of this company. The building has undergone, of course, some mild settling, but the construction throughout shows painstaking care that is unusual in this hit-and-run construction period. The stonecutting on the building, by the Concord, Vermont plant of the John Swenson Granite Company and the Procter and Rutland, Vermont plants of the Vermont Marble Company, is a joy to behold, on a level of craftsmanship that is unbelievable.

Along the central rib of the granite crosses, where the stone is cut to a sharp edge right down the middle of the arm, it goes true and precise and flawless. Eight feet above the plaza, the underside of the head above the glass wall is faced with granite slabs, and the joint between them runs 131' long, as neat and level as if laid out with a transit. The paving slabs in the quadrangle are laid with the fine precision for which New England was once noted. The pointing at the joints of the building is precise and unrippled. The whole building has been done with a pride of workmanship that has nearly gone from the world.

#### THE EXHIBITION CASES

I have deferred discussion of the exhibition cases because this library has solved more of the problems involved in designing them than any I have seen, but there are still more problems to be

solved, and cases are extremely important in a rare book library. The ideal exhibition case should keep out all dust, and should therefore be sealed. Yet it must have movement of air within it because stagnant air invites mold. To be dustless this air must be prefiltered, and forced into the case, preferably through the top to be vented out the sides or bottom. The cases must avoid being heated, yet to avoid reflections in the glass facings, they should be lit from the inside. This means that they must be cooled with great precision, ideally, by a separate machine. Since fluorescent lights are much cooler than incandescent, they would seem to be most fit for this lighting, but they produce ultraviolet rays which make paper and vegetable dyes deteriorate rapidly, and must be properly filtered if used.

The cases must be at the right height for easy viewing, and not so large that part of the exhibit is too far away from the viewer. They must be easy to load. They must provide a background that will contrast with a range of different colors and textures. They must be esthetically pleasing in appearance.

It is easy to see how many of these qualifications are violated by the standard flat museum case, or its variants, and the common upright exhibition case. To the credit of the architects, they have designed all the exhibition cases in the Beinecke library, all of which are esthetically pleasing, and, with one exception, which is really a bookcase, place the material exhibited in the right position for viewing.

I have already referred to the pleasant feeling produced by the cases at the head of the stairs leading up to the mezzanine. Though they give the illusion of open bookshelves from the entrance, they are glass-enclosed bronze cases about eight feet high built in the form of two upright flat arcs, which touch where they back into each other. They have curved glass fronts, which slide

<sup>29</sup> *Architectural Record*, CXXXI (April 1962), 130.

rather stiffly to open, and are fitted with shelves designed to display the backs of books. They are enclosed bookcases.

These cases have the worst heat problem, because they are brilliantly lit by round, incandescent lights set in a row in the ceiling of the bookcases just three or four inches from the tops of the highest books. They are air conditioned, but the temperature in them runs about 80° in the top of the cases.

There are two large-headed cases tailored (one a little snugly) to specific books—Yale's magnificent copies of the Gutenberg Bible and the elephant folio Audubon. The Gutenberg case has four glass sides, framed in bronze, that measure 4' x 4', and is set on a single, square pedestal whose diagonal is at right angles to the axis of the case.<sup>30</sup> This case is lit by small, round incandescent lights, set in the ceiling of the case, whose intensity is controlled by a rheostat. A transformer is built into the case to cut the electric voltage, and its heat, combined with the heat of the lights, raises the temperature to 83° when the lights are on full. The temperature is kept to 70° by lowering the lights to a sombre, holy, concealing level of intensity, which defeats the purpose of the case. The Audubon case at the other end of the floor has two glass sides that measure 4' x 10', with bronze frames and bronze end panels. It has exactly the same heat difficulty as the Gutenberg case for exactly the same reasons.<sup>31</sup>

<sup>30</sup> The pedestals on all the rest of the cases are of this type, and small enough so that they stand recessed below the case and are not very noticeable. They are hollow, and serve as the air conditioning intake ducts for the cases.

<sup>31</sup> The most frightening aspects of the strange world of architects to librarians new at library building are its weird imprecision and radical lack of common sense. For instance, having made such a failure in such strategic elements as these cases, the librarian expects a firm with a high reputation to rush in to remedy the situation and wipe the blot from its escutcheon. Not at all! Some six months after the move into the Beinecke library, Skidmore, Owings, and Merrill were still blithely ignoring the university's pleas to do something about these cases. Since my study of the building, they have made an attempt at recovery by trying to increase the velocity of the air through the cases, when the most obvious solution

The nine single cases on the east and west walls are attractive and well lit, and they place the materials at the right height for viewing and close enough so that ordinary typing is easily readable on the labels in the cases.<sup>32</sup> They have two glass sides 2' x 4', framed in bronze, and the ends are provided with frosted glass panels, against which color slides can be mounted for viewing. These cases are lit by three slimline fluorescent tubes, within the case but above a solid plastic diffuser, below which is a metal louvre formed of half-inch squares. These cases also had heat difficulties when they were first used, but this has been completely solved by cutting holes in the top of the case above the tubes an inch and a half in diameter. The holes let in dust, most of which is caught on the diffuser, but allow the the temperature to be held to 70° in the cases.

The bed of these cases is painted with a textured and toned flat black paint that provides the best background for exhibiting materials that I have ever encountered. Devised by the Yale plant department, it is washable, shows no brush marks, can be applied to metal or wood, and is so inexpensive and simple to apply that they paint their case beds once a year at Yale.<sup>33</sup>

The long, flat cases that flank the glass vault on the main floor are totally successful, and this is where material is exhibited in connection with undergraduate courses. They measure 4' x 32' and are pedestal mounted and air conditioned. These cases completely avoid the

is to remove the sources of heat from the cases, by placing the transformers remote from them (not easy but possible) and locating the lights outside of the case above a glass diffuser. These special cases were conceived too late in the planning to get a proper duct system. This problem could probably have been avoided if the building had been programmed to begin with.

<sup>32</sup> These cases can be seen in the background of the photograph on p. [145] of the *Yale University Library Gazette* for April 1964.

<sup>33</sup> Yale's formula: one gallon of Devco's Flat Black oil paint; one pint of Martin Senour Radiant Red oil color pigment. To achieve the same tone and texture, these brands must be used, but your plant department can experiment, too.

usual surface reflections that are so disturbing in flat cases by lighting their interior with slimline fluorescent tubes mounted out of view in the sides of the cases. Light from the tubes, which are covered with plastic filter shields, is reflected by a curved mirror into the cases through a polarized panel in such a way that the viewer is not aware of the light source. These cases, higher than usual for flat cases, place the material at the right height for easy viewing, and are handsomely well proportioned. Their flat-black painted beds are set on rollers in eight-foot sections that allow them to be pulled out into the open for mounting materials.

#### THE ESTHETICS

As indicated above, the exhibition head is very impressive, and the reading room floor is on the whole pleasant and appointed in fine taste. But when the ultimate question is posed—is it a beautiful building? the answer is—not quite. Looking at it from across the quadrangle for an hour on a tranquil evening made it clear that in fitting it to the surround-

ing buildings, the architects had put together forms, in the crosses and the facing panels, that are not completely harmonious with each other. It is an extremely strong building in the impact it makes on the viewer, very interesting, full of character, and highly original, and in a building these are perhaps qualities more to be desired than beauty.

I have tried to make clear that this is, on the whole, an outstanding building, flawed (as are all buildings) at the points indicated, but very good in its most essential elements. It is a building that has pioneered in a number of ways, and one that thoroughly deserves the AIA-ALA award granted it in 1964. If some of the mistakes made in its begetting are naive at this stage of library building, it is partly because postwar academic library buildings have not been subjected to demanding scrutiny in public places, and partly because the relationship between the architect and the librarian has not received sufficient comment to be understood in the library world. Let us hope that both deficiencies in information will be speedily remedied. ■■

## Junior Members Round Table Orientation Session

AN ORIENTATION SESSION cosponsored by the ALA Membership Committee and the Junior Members Round Table will be held for persons attending their first ALA conference and members eligible for JMRT, on Sunday, July 4, at 2 p.m.

Frederick H. Wagman, immediate past president of ALA, will speak to the group on "The New Member and ALA." ■■