



BUILDING TYPES STUDY

HOSPITALS

228



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*For complete story on this project see Engineering News-Record, July 28, 1955, Pages 34-37.

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ARCHITECTURAL RECORD (Vol. 118, No. 5, November, 1955) is published monthly by F. W. Dodge Corporation, 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. \$5.50 per year; Foreign, \$20.00.

Entered as second-class matter at the Post Office, Concord, N. H., March 16, 1946, under the Act of March 3, 1879.

ARCHITECTURAL RECORD

November 1955 Vol. 118 No. 5

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ones is so marked as to give the artistic world a good shaking. Art no longer worships the machine.

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Members of Audit Bureau of Circulations and Associated Business Publications. Architectural Record is indexed in Art Index, Industrial Arts Index and Engineering Index.

Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

Subscription rates in U. S., U. S. Possessions, and Canada: \$5.50 for one year, \$9.00 for two years, \$11.00 for three years. Elsewhere, subscriptions from those who by title are architects or engineers, \$6.50 for one year, \$11.50 for two years, \$15.00 for three years; subscriptions from all others outside U. S., U. S. Possessions and Canada, \$20.00 a year. Single copy price, \$2.00. Circulation Manager: Marshall T. Ginn. Change of Address: Subscribers are requested to furnish both old and new addresses, sending if possible the stencil impression from magazine wrapper. Allow four weeks for change.



P E R S P E C T I V E S

THE BUILDING INDUSTRY is safer than it used to be, the 43rd annual National Safety Congress was told last month; the old saying that a skyscraper costs one life for every story is no longer true. William G. Rapp, assistant to the general manager of steel erection at Bethlehem Steel Company, recalling that at one time structural steel erection was classed among the most hazardous occupations, quoted figures showing that in the last 10 years the industry's accident frequency rating has dropped from 82.7 to 25.9 and the severity rating from 17.4 to 4.9. Building code revisions, equipment modifications, union emphasis on safety, all were credited by Mr. Rapp with contributions to the improvement.

TALLER BUILDINGS in the center city and a greenbelt at least 15 miles wide around it are proposed by New York realtor William Zeckendorf as the antidote to cities choked by "fluid suburbia": endless chains of outlying communities offering "no change of pace" which he declared are "against the nature of man." To Mr. Zeckendorf, addressing the American Society of Civil Engineers at its New York convention last month, "greater verticalization" appeared to be the answer.

THE FLIGHT TO THE CITIES from the suburbs may be the story in 15 or 20 years "if the city is slowly and steadily made better and better," architect and city planner Henry S. Churchill, F.A.I.A., of Philadelphia, told this fall's A.I.A. Central States Regional Conference at St. Louis. But, said Mr. Churchill, the "livable city of tomorrow will come through the collaboration of the people sitting in this room and not by way of an unworkable Federal program." Emphasizing the need for "the highest degree of collaboration between many skills and disciplines—the paper planner, the economist, the architect, the realtor, the traffic engineer, the administrator and politician," Mr. Churchill offered some points for their consideration: "City planning and urban problems are not separable

from regional planning and suburban sprawl. . . . Traffic congestion is not solved by highway engineers. . . . Zoning has degenerated into a device to 'stabilize' land values. It must shortly be returned to some more useful purpose or else abandoned. . . . In rebuilding the city, new patterns must be devised suitable to our new technological devices. But in doing this inspiration can be found, if you look for it, in the older parts of your city. There you will often discover quiet and beauty in the way land is used, the way buildings are sited, the way streets are laid out. . . . Take a good long look at taxes, financing costs and the relation between the professions of the government agencies and their practices. This is an economy of private enterprise for profit, and if the system is to continue profit cannot be defined in terms of a bureaucrat's salary." The special role of the architect in rebuilding the city Mr. Churchill defined as "making what comes to pass worth the trouble of achieving. It is his job," Mr. Churchill declared, "to make the city not only livable in terms of physical needs but a place for spiritual rejoicing. . . . Man is not humble in the city as he is in the fields, the hills or the sea, but properly prideful and vainglorious at his achievements. It is the architect who states this pride and vainglory in visible form. If he does so with understanding of man's need for pride in his own works, the city will again flourish as a city. If the architect fails in this, from whatever cause, ignorance or indifference, the city will fail and we will have merely 'planned communities.'"

WONDERS OF THE U. S.: For the last three years the American Society of Civil Engineers has been working toward the selection announced last month of "the seven modern civil engineering wonders of the United States." These successors to the Seven Wonders of the Ancient World were selected by a national committee of A.S.C.E. members from nominations of local Wonders made by the various local sections of A.S.C.E.

Unlike the ancient wonders, which included four architectural monuments among them, the present Wonders include only one building structure, that pride of New York's proud skyline, the Empire State Building (Shreve, Lamb and Harmon, architects). The list: 1. Chicago's Sewage Disposal System; 2. the Colorado River Aqueduct; 3. the Empire State Building; 4. the Grand Coulee Dam and Columbia Basin Project; 5. Hoover Dam; 6. the Panama Canal; 7. the San Francisco-Oakland Bay Bridge. Compare the selections (about 200 B.C.) of that Greek Baedeker, Antipater of Sidon, as the Seven Wonders of the Ancient World: 1. the Pyramids of Egypt; 2. the Hanging Gardens of Babylon; 3. the statue of Zeus at Olympia; 4. the Temple of Artemis at Ephesus; 5. the Mausoleum at Halicarnassus; 6. the Colossus of Rhodes; 7. the Pharos [lighthouse] of Alexandria. Of these only the Pyramids have survived; but then, the Seven Wonders of the Ancient World do not appear to have been selected, like those on the A.S.C.E. list, as *engineering* wonders.

RANDOM RUBBLE: "Build a terrace first; your landscape can wait," advises *Better Building News*, Building Stone Institute news-sheet. . . . Harry S. Truman on Lever House (on the route of an early morning walk during a recent New York visit): "You mean the soap building? I don't like it. Yes, I like them old-fashioned" (or so *The New York Times* reported). . . . Fashion note: "Went lot-hunting with an architect friend on the North Shore of Long Island," ran the copy for a recent newspaper ad by a men's specialty shop. "Noticed what he wore for his field trips. Cotton and wool sportshirt (washable) with an unabashed check pattern. Slim, black-brown flannel slacks." . . . East is west, and the twain do meet: the interior designer with experience in residential work, reports the magazine *Interior Design*, "has taken the commercial stigma out of nonresidential interiors by giving them a distinctly residential character. . . ."

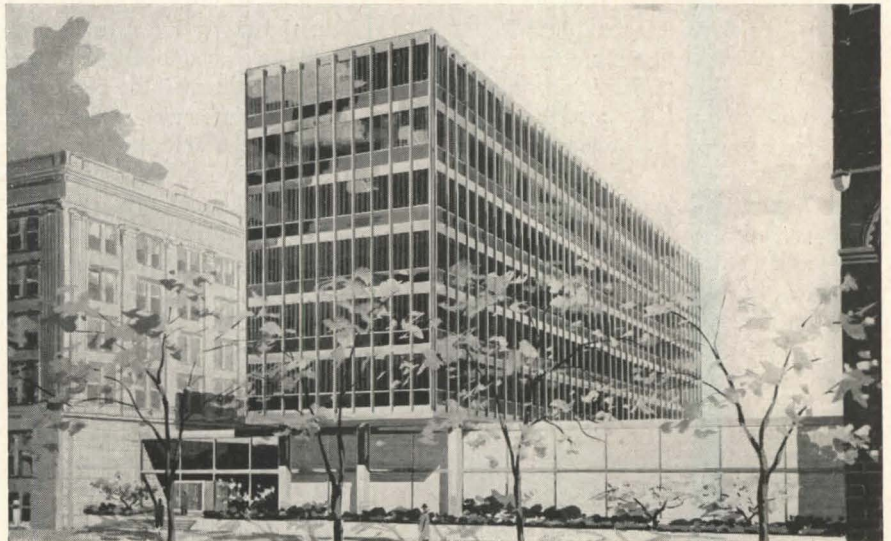
THE RECORD REPORTS

BUILDINGS IN THE NEWS

MIES VAN DER ROHE's newest residence halls for Illinois Institute of Technology were dedicated last month on I.I.T.'s Chicago campus — two nine-story apartment buildings, erected at a cost of \$1,250,000 each, which together provide 144 living units for faculty and students. They are the 17th and 18th new buildings designed by Mies and constructed at I.I.T. in little more than a decade; in appearance they are almost identical to Carman Hall, one of the two residence halls completed a few years ago. Cunningham Hall (photo at right) contains 56 units of six, five and two rooms; the other new building, Bailey Hall (not shown), has 88 units of four, three and two rooms

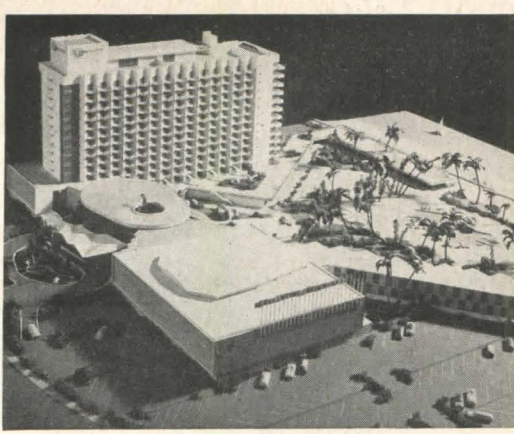


SKIDMORE, OWINGS & MERRILL are the architects for the new Heinz Research and Quality Control Center now under construction in Pittsburgh. The building (photo of rendering at right) will serve as the research and development center for the domestic and international operations of the Heinz Company and as the company's executive headquarters, containing pilot plant, experimental kitchens, research laboratories, quality control laboratories and library as well as offices. The structure will be aluminum, glass and steel — a completely sealed structure with a double external glass skin, the transparent sections glare- and heat-resistant. Completion is scheduled for January 1957. Estimated cost: \$3 million. General contractor: George A. Fuller Company



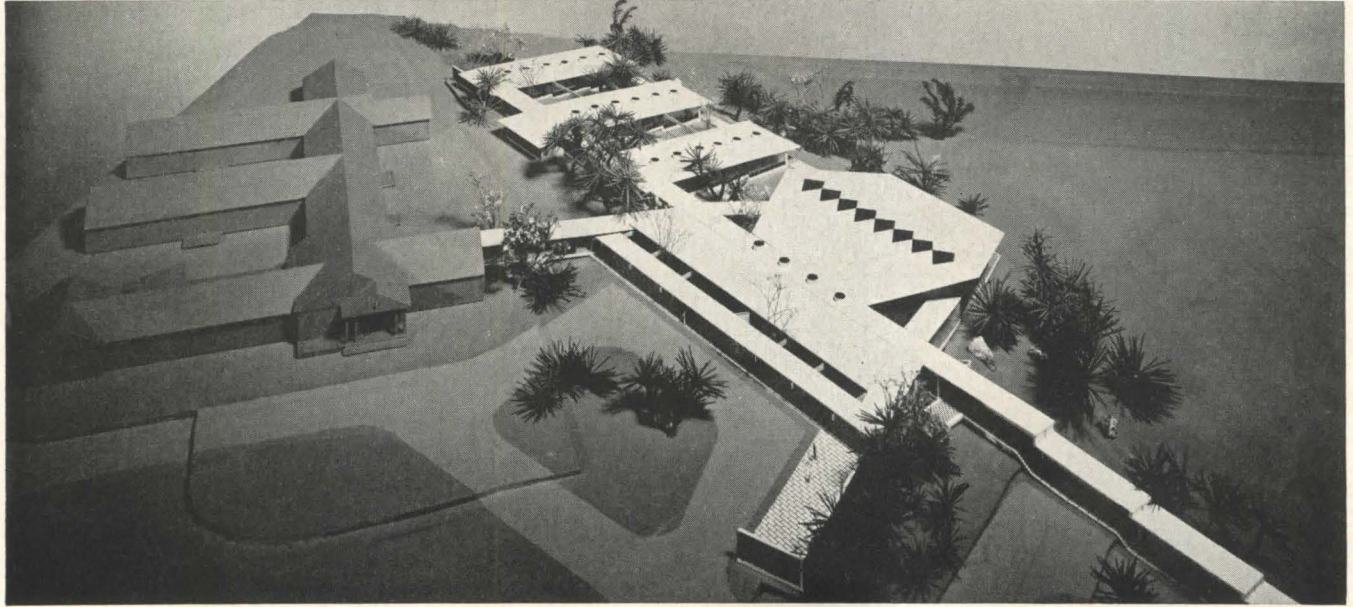
TALLEST BUILDING IN THE SOVIET UNION — 32 stories, 660 ft — is main building of Moscow University, described by Soviet chief architect Alexandrei Vlasov (see page 48) as most noteworthy recent Soviet architectural project. Completed in 1953, the university comprises 27 main and 10 subsidiary buildings on a 790-acre site on Lenin Hills, highest ground in Moscow. Chief architect: L. Rudnev; Associates S. Chernyshov, F. Abrasimov and A. Khryakov





ANOTHER FLORIDA HOTEL by New York architect Morris Lapidus — the American Hotel, Bal Harbor, Fla., will provide 500 rooms at an estimated cost of \$10 million. The entire project has

been planned around an ocean-pool-deck area which will feature tropical gardens, terraces, cabanas and pavilions along with pools and the beach. The structure itself will include a two-story lobby and reception area, with a 15-story guest area on one side, and on the other a low wing for dining, dancing — and conventions



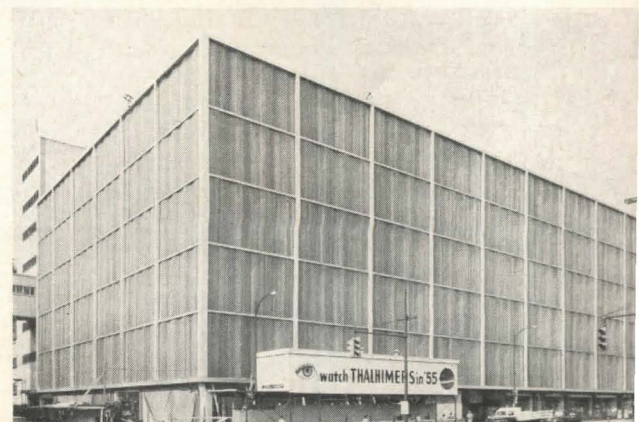
ONE-STORY SCHOOL ON FOUR LEVELS is elementary school planned for sloping site at Briarcliff Manor, N. Y., by architectural firm of J. Gordon Carr and Oscar F. Wiggins. Following site contours, covered corridor connecting units is on top level, classrooms in each unit on three successive levels below, at intervals of two and a half feet. Ramps connect the levels. Roofs will be cellular steel construction, pitched to slope of site; rest of structure brick and glass. Two-year-old primary school, of "Conservative design", is adjacent



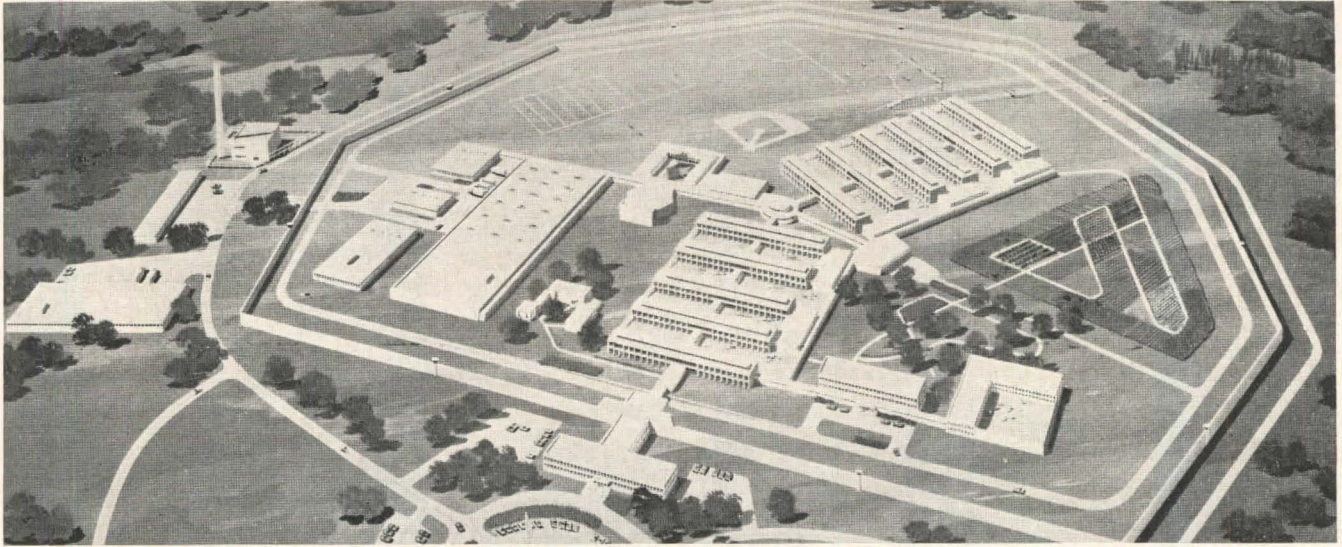
TALLEST BUILDING IN THE WORLD — 102 stories, 1472 ft (including 222-ft television tower) — has just been named by the American Society of Civil Engineers as one of "the seven modern civil engineering wonders of the United States" (see page 9). New York City's Empire State Building, completed 25 years ago, is the only building structure and the only privately financed project among the "wonders." Architects were Shreve, Lamb and Harmon; engineers and builders, Starrett Brothers & Eakin



ALUMINUM JACKET of vertically fluted panels (right) was used to cover a full city block of stores of varying heights and façades (right above) in extensive expansion and modernization program just completed by Thalhimers Inc., Richmond department store. Architects: Copeland, Novak and Associates



(Continued from page 11)



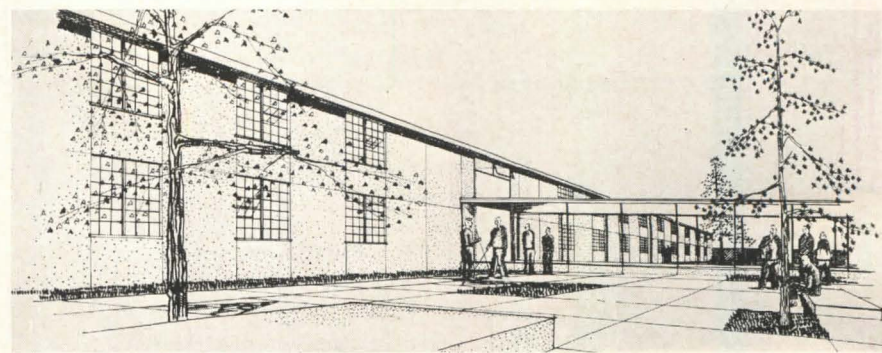
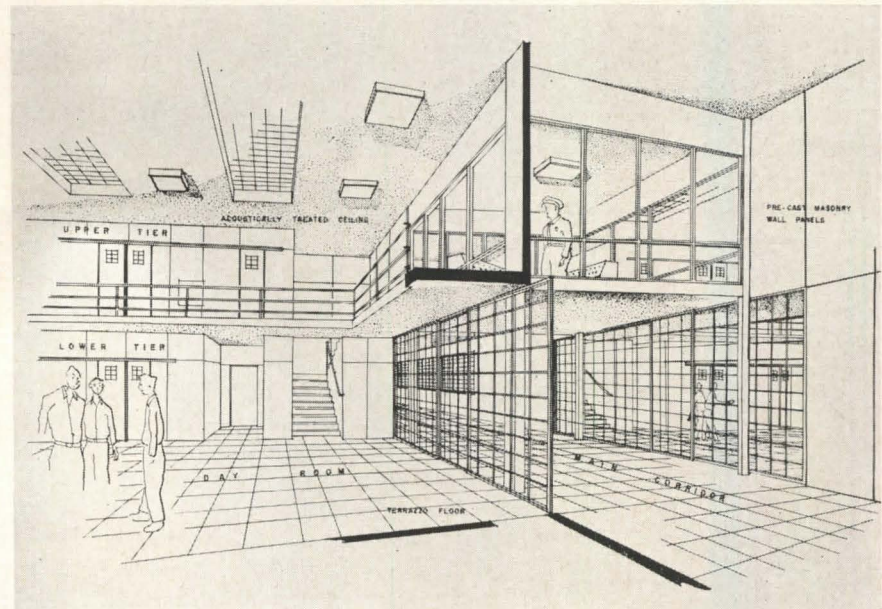
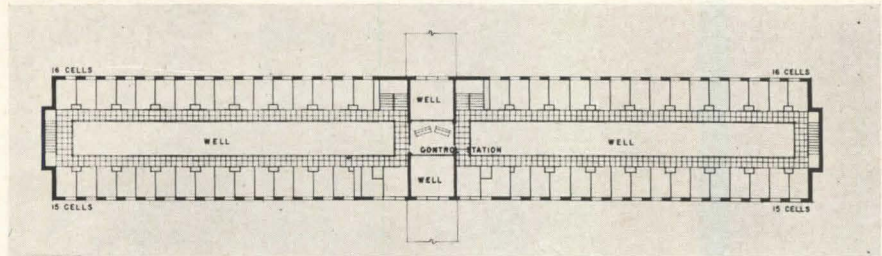
MODERN PLAN PROPOSED FOR CONNECTICUT STATE PRISON

A master plan for a new state prison at Enfield, Conn., which would at first relieve overcrowding at and later replace the present 128-year-old institution at Wethersfield, has been developed by architects Sherwood, Mills and Smith of Stamford. Initial construction, held up by the recent floods, may start next spring.

The scheme, which would provide ultimately for 1200 "maximum security" inmates within a 50-acre enclosure at an estimated cost of \$16.5 million, takes off from the conviction that "a modern maximum security institution should provide secure control and administration of different type inmates. It should have a program for physical, emotional, mental and vocational rehabilitation as well as provide labor that benefits the state."

The bent shape of the plan is dictated by existing grades on the site. The basic unit is the cell block, a departure from the usual solution of cell block control. The block straddles the "pole" corridor for efficient guard control at the center point, giving effective visibility into each half of the block, as well as along the "pole," from a station at upper tier level. Floor area at lower tier serves as inmates' "day room" and recreation area in inclement weather.

The enclosure, with guard towers every 500 ft, is pierced only at the sally port and at the main check point. Industrial shops, school, library, auditorium, hospital and chapels are all within enclosure. Outside are warehouse and service facilities, staff housing and (center foreground) administration building.



The State of Construction

The outlook for next year and for the next decade is bright, according to Thomas S. Holden's annual analysis of future construction potential (see "Construction: Growth Industry," opposite page 8). As for the present, construction contract awards as reported by F. W. Dodge Corporation in the 37 states east of the Rockies continue to set new records in nonresidential and heavy engineering categories but reflect the recent housing credit restrictions by showing the first year-to-year dip in housing contract figures for any given month since December 1953 (see page 406).

A New Kind of Hospital?

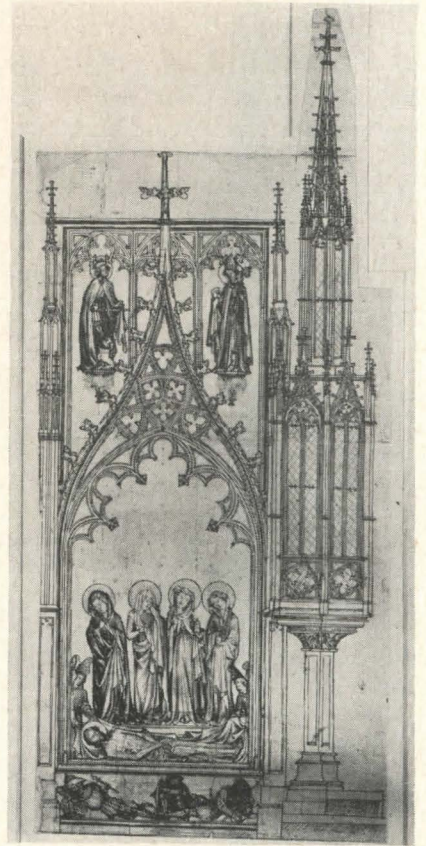
"Comprehensive medical care" was a kind of theme song for this year's annual convention of the American Hospital Association (Atlantic City, September 19-22); and, however academic it may be for the designers of today's hospitals, it was clear the push for integration is on. As the demands of rehabilitation and chronic illness bulk ever larger for an aging population which can hardly afford the high costs of acute illness today, the speakers agreed, the hospital must come to function more and more as a kind of health center for the community, with prevention and cure as its twin goals. Indications were that there might be a Federal government lead in that direction. Dr. Leonard A. Scheele, Surgeon General

of the U. S. Public Health Service, was among those who called for hospitals with a "totality of services" which would greatly expand their role; and he noted that it would be possible to encourage "integrated" projects by giving them priority in Federal grants. He acknowledged also that some thorny questions arise: how will the urgently needed development of more outpatient facilities affect doctors' practice? hospitalization insurance now designed for inpatients? The theme, however, was expressed in these words: "I think the time has come to lift hospitals and the care they give out of their old orbits and assign a new course to their history."

With the A.I.A.

Regional conferences and state meetings of the American Institute of Architects have been thick as the proverbial leaves of autumn. Following are reports on some of them, providing altogether a review of how the programs reflect the professional concerns of the moment.

The architect and his community was the official theme of the sixth annual regional conference of the Gulf States District of the A.I.A., held October 6-8 at the Roosevelt Hotel, New Orleans. The theme was effectively dramatized by the award of certificates for outstanding community service to a dozen architects — N. H. Holmes, Mobile, Ala.; Nelson Smith and Jack B.



"Holy Sepulchre and Tabernacle" (Middle Rhenish, ca. 1420) — One of the drawings from the loan exhibition "German Drawings from Five Centuries," which begins a nationwide tour this month under the auspices of the Smithsonian Institution

Smith of Birmingham, Ala.; Howard Eichenbaum and Guy Swaim, Little Rock, Ark.; Paul Young, Fayetteville, Ark.; Arthur Feitel, New Orleans; Ralph Bodman, Baton Rouge, La.; Dewey Somdal, Shreveport, La.; Robert W. Naef, Jackson, Miss.; L. L. Brasfield, Meridian, Miss.; and John Pritchard, Tunica, Miss. The program also included addresses on the church and the community, by Dr. J. D. Grey, pastor of the First Baptist Church, New Orleans; transportation and communications, by Louis I. Kahn, F.A.I.A., of Philadelphia; planning for integrated health services, by Dr. Alton Ochsner, New Orleans, and Robert Cutler of the architectural firm of Skidmore, Owings & Merrill; and the influence of architecture on business and commerce, by Harold R. Sleeper, F.A.I.A., of New York. Walter A. Taylor, A.I.A. director of education and research, appealed for postgraduate and inpractice training to keep the architect up to date on both practical and theoretical developments in his profession. There was a showing

(Continued on page 16)



— Drawn for the RECORD by Alan Dunn

"Do you suppose these Russians are after the profit motive as well as the knowhow?"

THE RECORD REPORTS MEETINGS AND MISCELLANY

(Continued from page 15)

of the revised version of Ralph Myers' "Architecture U. S. A.," now a color movie ready to provide the public with an introduction to contemporary architecture. Honor awards for entries in the annual architectural exhibit were given as follows: *First Honor Award* — Ensley Branch, Birmingham (Ala.) Public Library, Shaw & Renneker, architects; *First Merit Award* — Richardson Residence, Harahan, La., Curtis & Davis, architects, Walter J. Rooney Jr., associate in charge; *Awards of Merit* — St. Bernard Methodist Church, Chalmette, La., Dinwiddie, Laurence & Saunders, architects; Medical Office Building, Montgomery, Ala., Horton & Williams, architects; LiRocchi Community Building, Baton Rouge, La., Short & Murreli, architects; Riders Jewelry Store, Baton Rouge, A. Hays Town, architect; St. James Parish Hospital, Lutchter, La., Curtis & Davis, architects; First Presbyterian Church, Arkadelphia, Ark., Ginocchio, Cromwell & Associates, architects.

The theme for the tenth annual regional conference of the A.I.A. Central States District at St. Louis October 13-15 was "The Collaboration of the Design Professions." As developed in sessions on the impact on design of structure, mechanical equipment, acoustics and site planning, it focused on practical rather than esthetic aspects of the problem. Speakers included engineer Fred N. Severud of New York; architect Charles Haines of Voorhees Walker Smith and Smith, New York; Robert B. Newman, of Bolt, Beranek and Newman, consultants in acoustics, Cambridge, Mass.; Lawrence G. Linnard, Detroit, past president of the American Society of Landscape Architects. High-



At the Northwest Regional Meeting, held at Glacier National Park in September, A.I.A. President George Bain Cummings was made an honorary chief of the Blackfeet tribe; here he is flanked by two of his fellow chieftains. Bottom, left: key speakers were architects Hugh Stubbins, Lexington, Mass., and Minoru Yamasaki, Detroit. Right: Regional Director Waldo Christenson and regional secretary Robert Dietz, both of Seattle

light of the conference was the rather fiery luncheon speech in which Henry S. Churchill, F.A.I.A., blasted "official urban renewal attitudes" as responsible for the present "failure" of city planning and called for a new and realistic kind of public-private collaboration in the solution of city planning problems. (For more on the Churchill speech, see page 9.) An address on "Advanced Education for the Architect" by the A.I.A.'s Walter Taylor was another feature of the program. Awards on the architectural exhibit were given by popular vote — *First Honor Award* to Murphy and Mackey, architects, for their Bishop Dubourg School; *Second Honor Award*, Russell, Mullgardt and Van Hoefen,

architects, for their Mercantile Motor Bank; and *Third Honor Award*, to Eric W. Smith, architect, for his Beaumont Scout Reservation Chapel.

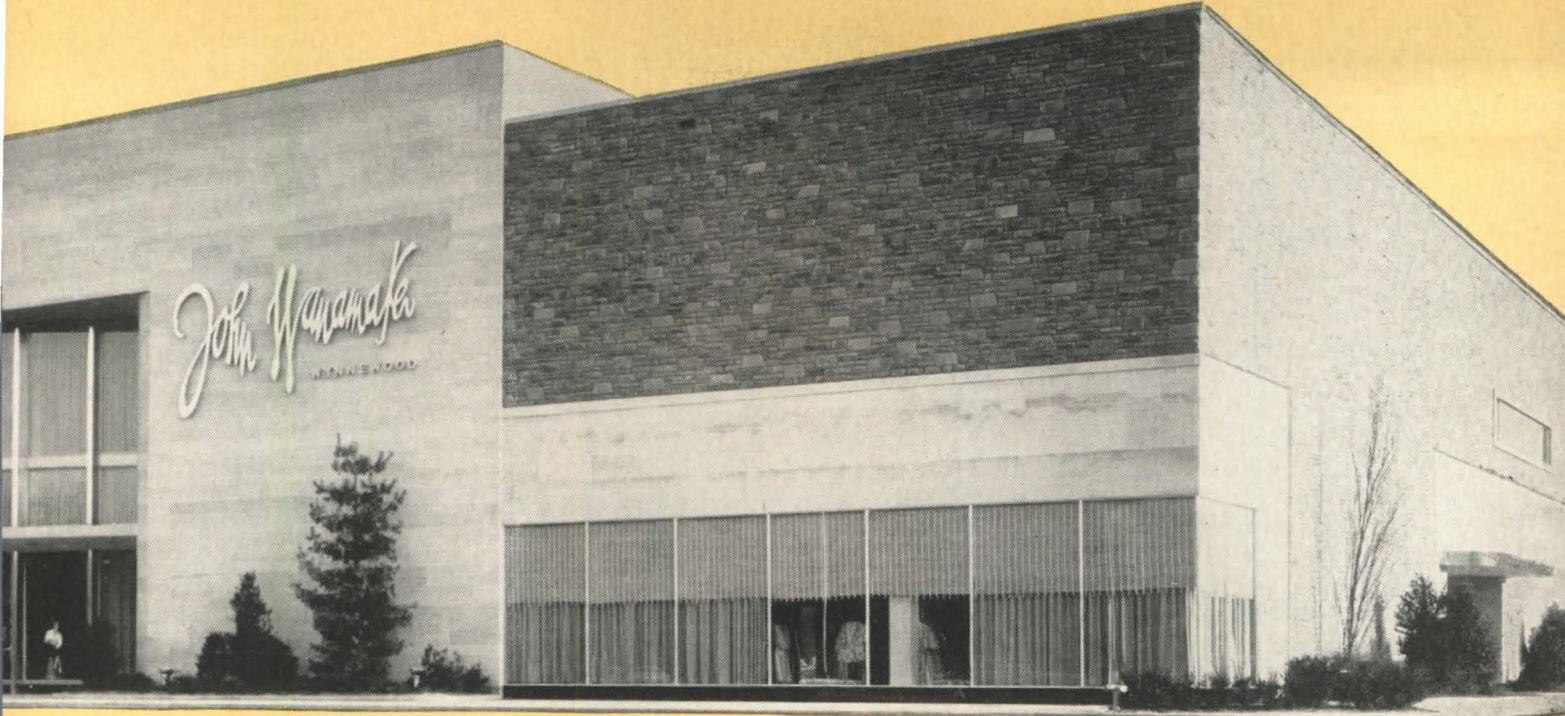
At the North Central States Regional Conference of the A.I.A. in Chicago October 13-14, hospital planning was the subject of a series of sessions calculated to inform the architect who has never had a hospital commission as well as the experienced designer of hospitals. A program arranged by Wilbur A. Tusler, F.A.I.A., chairman of the A.I.A. Committee on Hospitals and Health, included a panel discussion on the premiere question — i.e., how to get a hospital commission — as well as seminars

(Continued on page 20)



Present at the annual meeting of the Pennsylvania Society of Architects, held in Mann's Choice, Pa., at the end of September, were: (left) Paul Schell, president of the Pittsburgh Chapter, A.I.A.; Marcellus E. Wright Jr., Middle Atlantic regional director; and Walter M. Megronigle, of Kelchum, Inc., A.I.A. public relations counsel; (center) Weston Holt Blake, president

of the Delaware Chapter, A.I.A.; Samuel E. Homsey, who with John McLeod and Eric Pawley led a workshop on school design; and Charles S. Conrad Jr., president, Pennsylvania Society of Architects. Right: Robert A. Eyerman, legislative chairman, Pennsylvania Society of Architects; Mr. Conrad; and David H. Morgan, president of the Philadelphia Chapter, A.I.A.



Certified Craftsmanship IN ACTION...

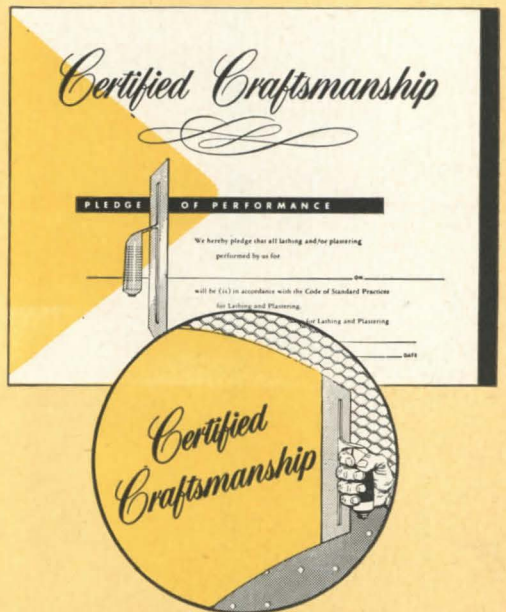
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ARCHITECTURAL CRITICISM: I

“ARCHITECTURAL ABERRATIONS”; OR, NOTHING BUT THE AWFUL TRUTH

The complaint, familiar to all architectural editors, that American architectural magazines “aren’t critical enough” could hardly have been directed at the early editors of the RECORD. The series called “Architectural Aberrations,”* written by an anonymous critic, must have satisfied the most demanding reader. And although architectural credit was omitted in every case, it is

doubtful whether the architects involved were ever heard to complain that they had been forced into the ranks of “Architects Anonymous.”

The style was set in the lead of the first “Aberration” (October–December 1891) when the critic wrote of the Edison building in New York: “Danger lurks in the superlative degree. Of each of how many things is one tempted to say that it is the best or the worst of its kind,

we shall not say that the Edison building in Broad street is the worst building in New York, or the worst commercial building in New York, or even the worst of recent commercial buildings in New York. We will content ourselves with saying what can be established beyond dispute and what ‘jumps to the eyes’ in the contemplation of it, and that is, that it is of a very eminent badness.”

Of the same building, and in the same

THE RECORD REPORTS
NEWS FROM CANADA

(Continued from page 30)

into the hundreds of millions of dollars annually (for construction), but their spending is only a relatively small part of the national total. What we aim to do should be the aim of governments at all levels and of private enterprise . . . we both have made some progress but it is not enough.”



NEW QUARTERS COMPLETED
FOR UNDERWRITERS' LABS

Underwriters' Laboratories of Canada began moving into their new fire-testing building, recently completed near Toronto, at the end of September. The \$150,000 building has facilities for testing building materials, all types of heating equipment and accessories and fire extinguishing systems. A tower room 20 ft square and 45 ft high is designed for special tests like the 30-ft drop test for fire-resistant safes. The building, which has an area of 10,000 sq ft, is planned for extensions ranging up to 80,000 sq ft, to be built within the next 10 or 15 years.

Parrott, Tambling & Witmer of Toronto were the architects.

EIGHT PLANNING STUDENTS
RECEIVE CMHC FELLOWSHIPS

The Central Mortgage & Housing Corporation has awarded eight fellowships for postgraduate study in community planning during the 1955–56 academic year.

The fellowships, worth \$1200 each, are granted under the National Housing Act.

The recipients and the universities they will attend: J. B. Carisse, Ottawa — McGill University; R. D. Fryer, Ottawa — University of Toronto; H. R. Fulton, Chilliwack, B. C. — University of British Columbia; I. E. Innes, Regina — University of Manitoba; J. C. Langlois, Montreal — McGill University; J. D. Leaning, Montreal — McGill University; Frances S. Pearl, Montreal — McGill University; and R. R. Youngsberg, Rainy River, Ont. — University of Manitoba.

The committee of awards was composed of Professor J. A. Russell, director of the School of Architecture, University of Manitoba; Dr. W. H. McEwen, dean of Graduate Studies, University of Manitoba; and Alan Armstrong, of Central Mortgage & Housing Corporation.

(Continued on page 36)

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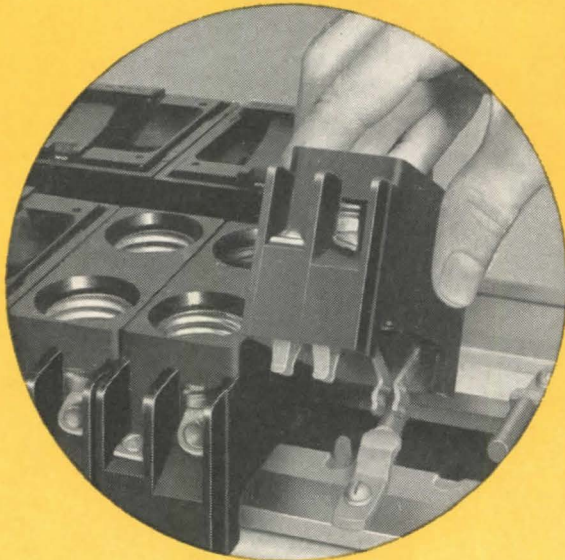
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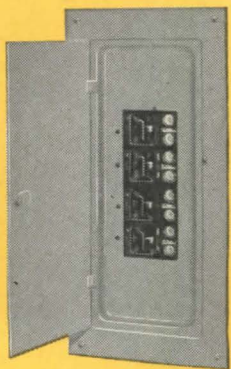
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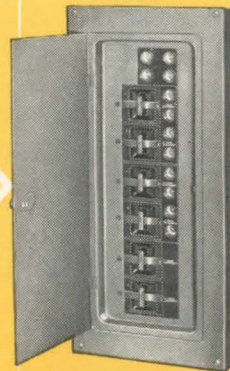
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THE RECORD REPORTS NEWS FROM CANADA

(Continued from page 32)

MONTREAL TRAINING CENTER DEDICATES A NEW WING

On the tenth anniversary of its establishment, Montreal's building trades apprenticeship center opened new offices and shops. Premier Maurice Duplessis of Quebec, speaking at the official ceremony and blessing in September, termed

the institution an outstanding example of what can be accomplished with the cooperation of state, employers and employes.

More Apprentices Needed

W. G. Malcom, president of the Canadian Construction Association, in an address at Sudbury, Ont., at about the time Montreal was opening the training center's new facilities, said that there was a major shortage of apprentices in the building industry, and pointed out that over 500,000 on-site

construction workers are carrying out Canada's construction program this year, but that there are only 22,500 registered apprentices in the industry. "Our goal should be to at least double the present apprenticeship total," he said. The problem directly affects construction's 20 per cent of the gross national product and employment, and cooperation and understanding within the industry are essential, he added.

SOIL MECHANICS CONFERENCE TO BE HELD IN VANCOUVER

The ninth Canadian Soil Mechanics Conference is scheduled to be held in Vancouver December 15-16. Sponsored by the Associate Committee on Soil & Snow Mechanics of the National Research Council, it is being arranged with the University of British Columbia by a local committee. Although a detailed program has not yet been drawn up, a general discussion period dealing with pertinent problems will be included on the agenda.

Information about the conference can be obtained from A. Peebles, Professor of Civil Engineering, University of British Columbia, Vancouver, B. C., or from W. J. Eden, Secretary, Association Committee on Soil & Snow Mechanics, National Research Council, Ottawa 2.

CHIEF ARCHITECT FOR CMHC NAMED, COMPANY ANNOUNCES

Ian R. MacLennan, of Regina, has been appointed chief architect of Central Mortgage & Housing Corporation. He succeeds S. A. Gitterman, who has been appointed advisor on housing construction with the corporation's development division.

Mr. MacLennan has been with a firm of architects in Caracas, Venezuela, since 1952, and previously was associated with Voorhees Walker Foley and Smith (now Voorhees Walker Smith and Smith) of New York.



The Elmridge Apartments are some of many new units completed in Toronto's current apartment "boom"; Wilfred Shulman, architect

(Continued on page 40)

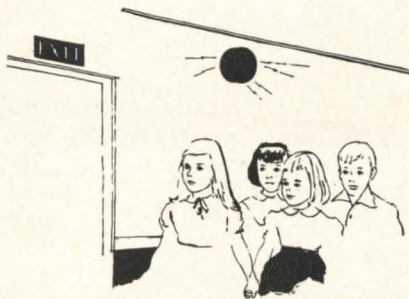
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ANOTHER GENEVA POSTSCRIPT: SOVIET ARCHITECT AND BUILDING OFFICIALS TOUR THE U. S. A.

The ten-man delegation of Soviet construction officials who toured the U. S. last month at the invitation and under the auspices of the National Association of Home Builders took their opportunity seriously. At every project they visited in the 12 cities on their coast-to-coast itinerary they asked countless pointed questions, tried equipment, took pictures, made endless notes, and came away whenever they could with blueprints to take home with them, if not — as in one case — an actual house. It was in San Francisco that the delegation head, I. K. Kozuila, U.S.S.R. Minister of City and Urban Construction, ordered a \$13,750 house he had admired in his tour of a Rolling Wood Construction Company project near San Bruno, Cal.; the company president, Andres F. Oddstad Jr., has agreed to prefabricate the house and ship it to Moscow along with instructions for its erection — it will go complete with lighting and bathroom fixtures; everything, in fact, except bricks and cement.

As a group, the Russians seemed not only serious but rather aloof, if not enigmatic — although it must be admitted that the language difficulty (only two

of the visitors spoke any English at all) did not contribute to the spontaneity of communication or to the dissolution of enigmas.

Interestingly enough, the most responsive of the group was its single architect member, A. V. Vlasov, who is president of the Soviet Academy of Architecture and as such the Soviet's chief architect, responsible just now for the reorganization of the Academy as an adjunct of the Government's own Building Committee to guide the Soviet's 15,000 architects — all of whom work for the government — in the design of buildings along less ornate and more economical lines under the new Soviet standardization program.

Mr. Vlasov, who was looking forward to visiting Frank Lloyd Wright at Taliesin East in the course of his tour, would not define any basic architectural philosophy as characteristic of current Soviet architecture — it is moving in too many directions, he said, and nobody can predict which of them will have any permanent validity. Mr. Vlasov called the two-year-old buildings of the University of Moscow (see page 10) the outstanding recent Soviet architectural project, al-

though he admitted to having some esthetic reservations about it.

As for American architecture, he had seen "that remarkable new auditorium" (of Eero Saarinen's) at the Massachusetts Institute of Technology and was filled with admiration at its technical virtuosity and at the faithfulness with which its functional requirements had been solved; but he wondered if esthetically it could be called equally successful. He would want to see it again, he thought, before he could decide for himself; in the meantime he asked himself if this was not perhaps an example of functional suprematism. At the time he was in New York, the third stop on the tour, Mr. Vlasov said he had not yet seen any other significant new architectural projects — the tours focused almost exclusively on housing — and he remarked somewhat wistfully that he would have to come back again "to see the architectural monuments." He did get to see one more in New York, when the Russians, at their own request, were taken to the Empire State Building and up to its 86th floor outlook to gaze with unconcealed awe and wonder, like any tourists, at that world-famous view.

The two aspects of the projects the visitors saw that seemed of most unflinching interest were the equipment — everything from hardware to kitchens (they also shipped a complete electric kitchen back to Moscow) and any use of concrete construction — precast concrete techniques were of special interest, because the Soviet construction program, with metals scarce and even lumber sometimes in short supply, relies heavily on prefabrication methods to produce the most building for the least expenditure of money, materials and labor. There is a good deal of experimental interest in prestressed concrete in the Soviet Union, but so far, members of the delegation reported, only experimental.

By the end of the month, the group was to have visited, besides Washington, D. C., where the tour began and ended, Boston, New York, Fort Wayne, Ind., Chicago, Seattle, San Francisco, Los Angeles, Tucson, Houston, Austin, New Orleans and Cleveland. They were to be entertained on their return to Washington at the headquarters of the American Institute of Architects, where panel discussions on American architectural practice were planned.

IN BOSTON, (below left) A. V. Vlasov, president of the Soviet Academy of Architecture and the only architect in the Soviet group, chats with a welder. Below right: with River House apartments in background, cameraman is V. Y. Isaev, chief of the Board of Construction for the City of Leningrad; the kibitzer A. F. Dubrovin, deputy Minister of City and Urban Construction for the Republic of Russia. Around the blueprints (right): I. K. Kozuila, Minister of City and Urban Construction of the U.S.S.R. and head of the delegation; V. N. Galitzky, chief of the Board of Housing and Public Construction for the Province of Moscow; and U. S. builder



THE UNDIFFERENTIATED TEAM MEMBER

THE ARCHITECTURAL PROFESSION is asking that its schools cooperate in the training of all who will serve the building industry. This request has come in the form of a resolution presented at the Minneapolis convention following an industry-wide conference.

The resolution notes that we need an increasing flow of well-trained men to create buildings — through financing, designing, manufacturing, distribution, construction, merchandising and management. It further notes that the need is not likely to be met through a single branch of study; and that the harmonious cooperation which may grow from the mutual understanding and respect of interdependent disciplines is imperative.

The schools are urged, finally, to help coordinate, when possible, “the contributory educational units,” and to support action initiated by other branches of study.

It is a reasonable resolution in concept and in phrasing. It suggests the central role of the architectural school which has always reflected — together with engineering training — the unifying, and hence central, role of the architect and the engineer who works with him.

For the schools the problem will be essentially one of developing favorable attitudes between architect and engineer and all who will play contributing roles. The architectural schools are not asked to teach all these. Indeed, at the college level the eventual career men in non-design roles would be difficult to identify. The architect and engineer, on the contrary, must start their professional careers in college, and with a high degree of serious, specific concentration; for they will play the only roles in building which are involved professionally with all the contributory roles.

This resolution underlines the central role of the designing professionals through urging their studied cooperation with others involved.

Yet those who would eliminate or reduce the architect and engineer to minor, salaried functionaries are finding comfort in the resolution which they interpret as equating the services of architect and engineer to those of the lender, promoter, and contractor; much as if one attempted to equate the roles of doctor, patient, nurse and druggist.

The resolution is being used by certain individuals and by at least one publishing organization who apparently find gain out of efforts to demote the architect and engineer. And although the term “building team” is nowhere used in the resolution, the promoters of this euphemism have used the resolution to support their insidious notion of a team in which the architect and engineer are completely undifferentiated members. Faceless members of a faceless team. A dream team without a quarterback.

The A.I.A. Committee on Education and the architectural schools who will continue to carry out the recommendations of the resolution must be thanked, and must be urged, as they proceed, to clarify the central, significant role of architect and engineer in building beyond all possible unwitting or deliberate misinterpretation.

John Knox Shear



ILLINOIS HOUSE FEATURES ENCLOSED COURTS

*House for Mr. and Mrs. Joseph J. Fazel, Wayne, Illinois
Schweikher and Elting, Architects*

Contractors: G. Peterson & Sons Mech. Engineer: S. R. Lewis & Associates Landscape Architect: Mary Moulton



Heinrich-Blessing

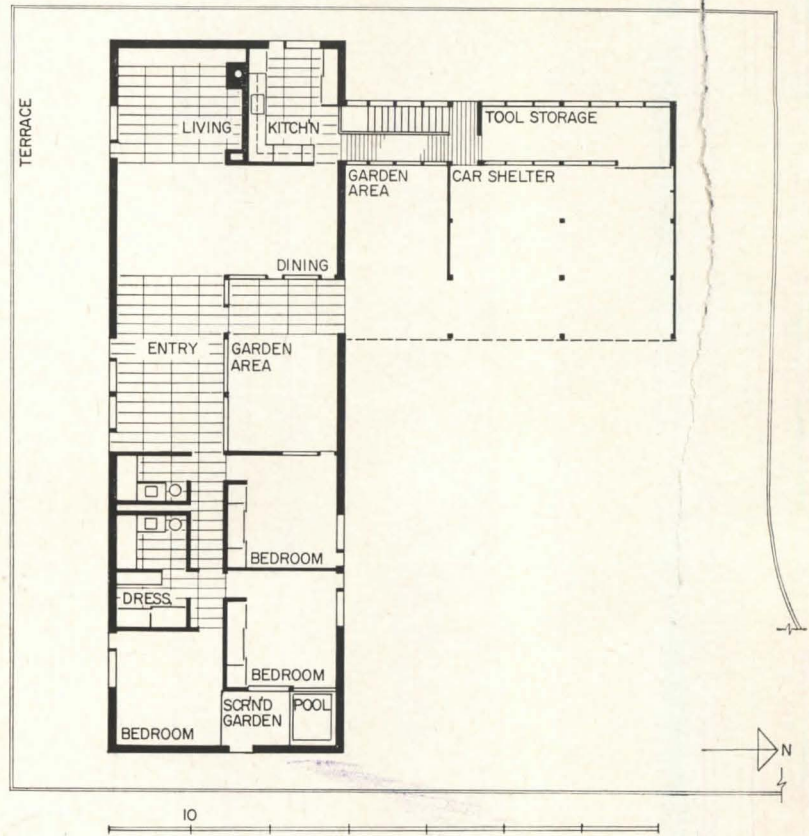
TWO GARDEN AREAS are enclosed within the perfect rectangle of this house, softening the discipline of the form and eliminating the sensation of being shut in. Heightening the effect of the courts is the contrast between solid brick wall and large expanse of glass, deliberately alternated because the architects believe that "alternate floor-to-ceiling openings and completely closed walls are more dramatic and livable, given appropriate surroundings, than the continuous glazed wall, either from ceiling to the floor or over a spandrel."

Every room in the house, including all three bedrooms (see plan, next page), looks onto one or the other of the interior courts. In addition, all main rooms open to the terrace surrounding the house on three sides, and the dining room is adjacent to the sheltered garden between house and carport. Planting in and around all garden areas was selected to bring the Illinois countryside into the house on a small, almost Oriental, scale.

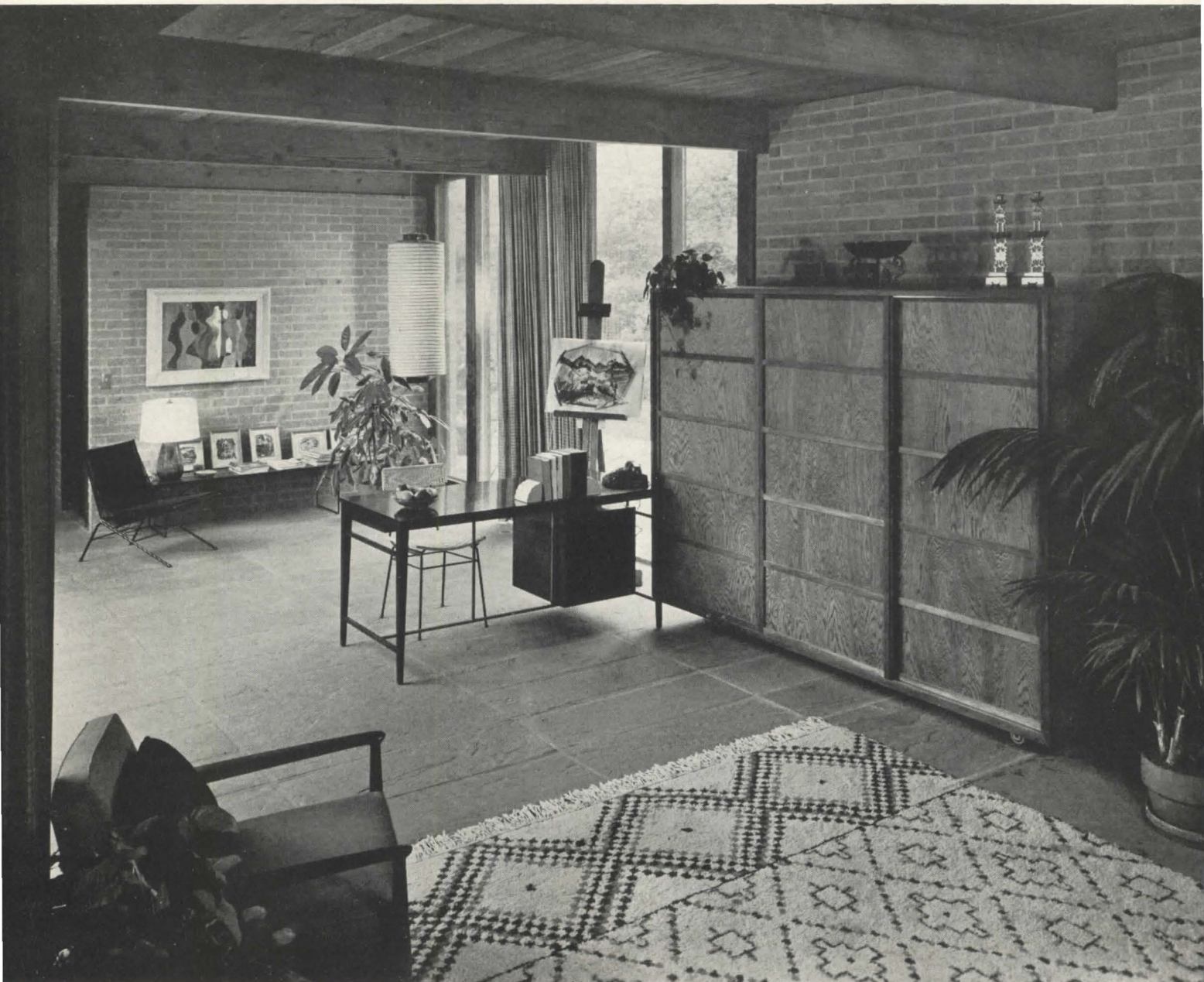




ILLINOIS HOUSE

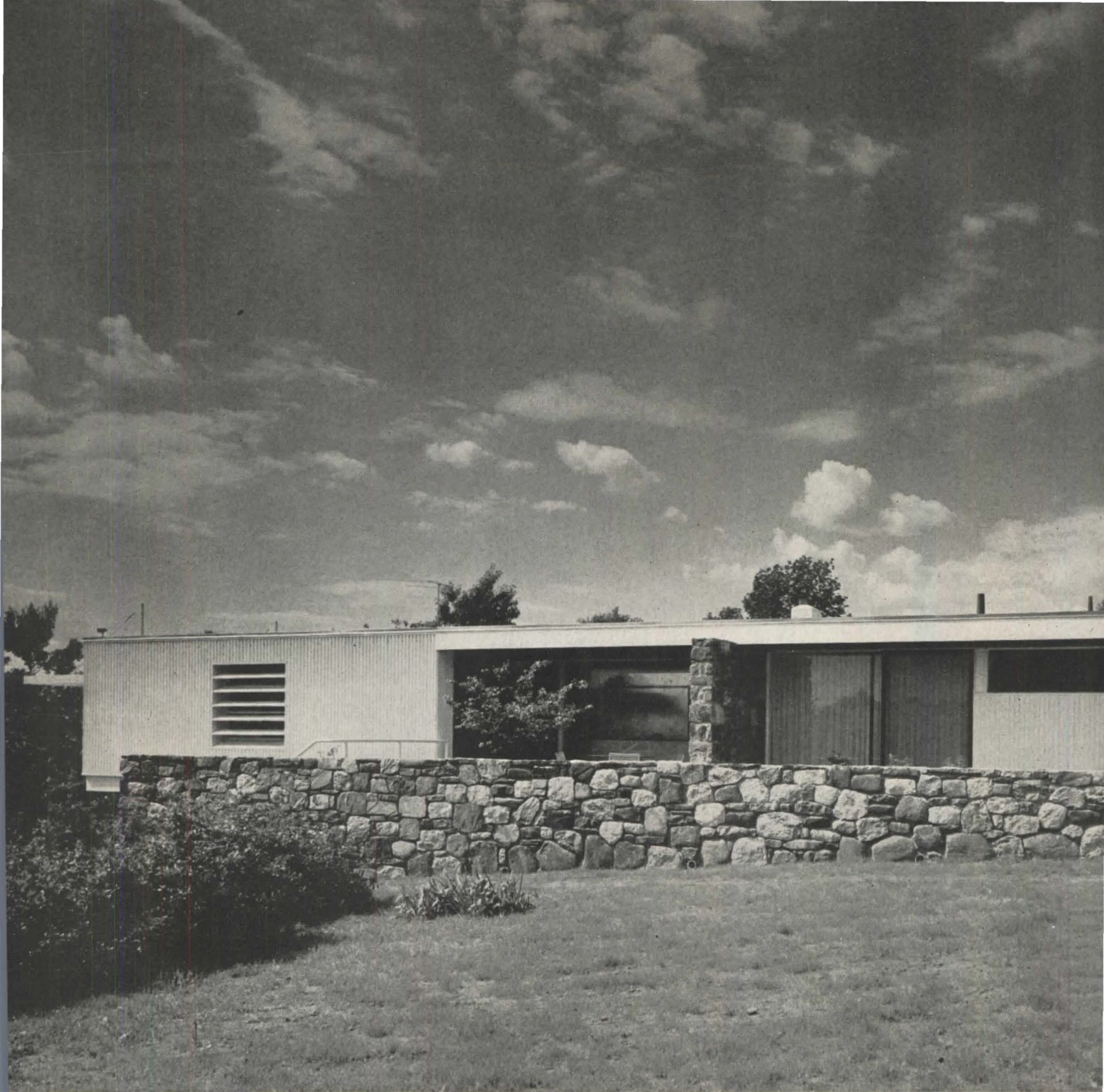


The effectiveness of the alternating open and closed parts of this house is evident in the photos on these two pages. The solid brick walls in the very open — and large — living-dining area provide what the architects call “the requisite coziness and security” and, not so incidentally, simplify furniture arrangement; the smooth flow from room to room, room to court, and indoors to outdoors enhances the feeling of space



Hedrich-Blessing

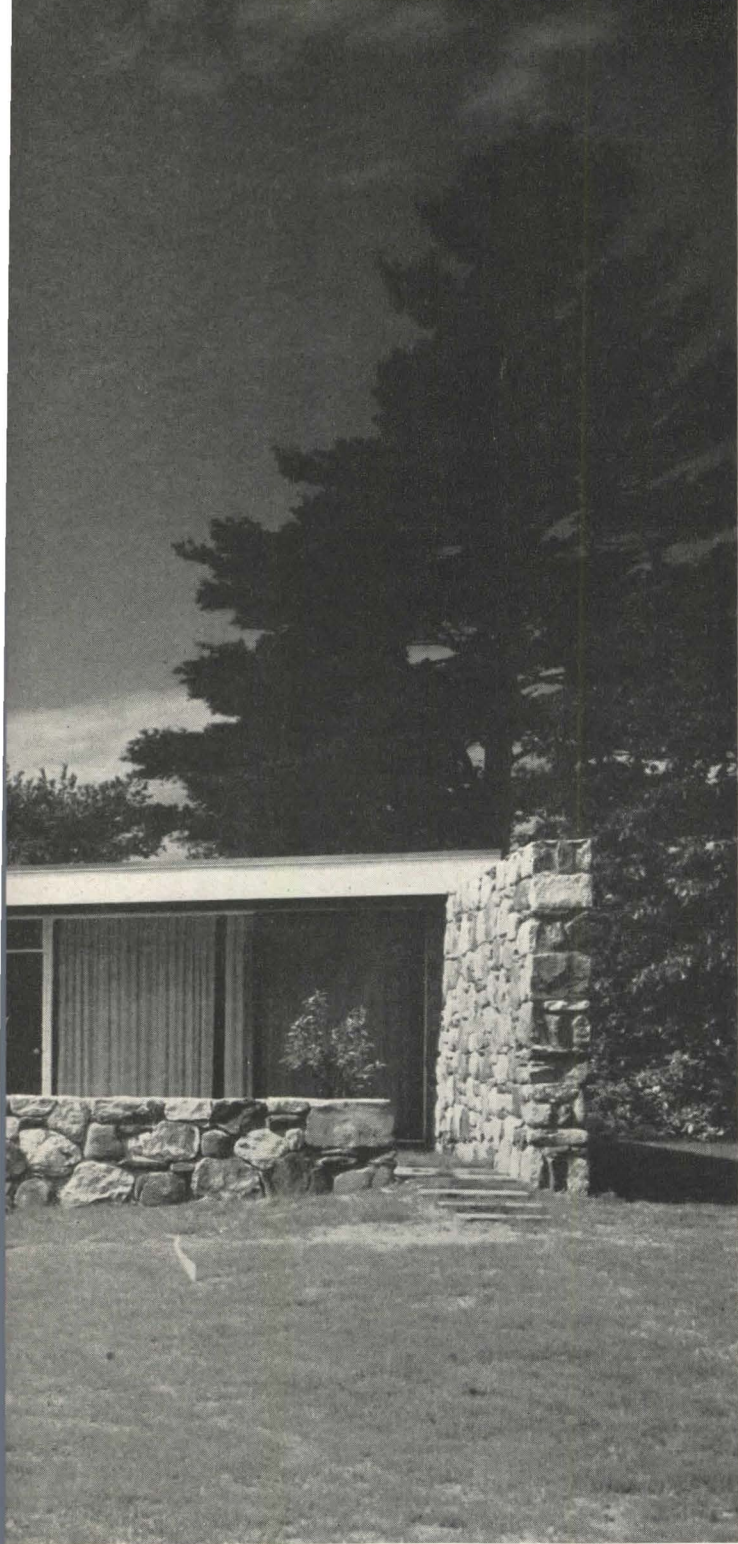
Construction is wood frame on a concrete foundation; walls are insulated cavity brick; heating is panel-type in the floor; roof is built up. Interior partitions are rough-sawn redwood, floors are stone or concrete, and ceilings are fir decking; openings are double-glazed. Photos: top, opposite — living room and dining area; bottom, opposite — stairs to basement, outdoor court, kitchen; above, main entrance



MASSACHUSETTS HOUSE HAS BI-NUCLEAR PLAN

*House for Mr. and Mrs. Vito Grieco, Andover, Massachusetts
Marcel Breuer, Architect*

Engineers: Wiesenfeld and Hayward

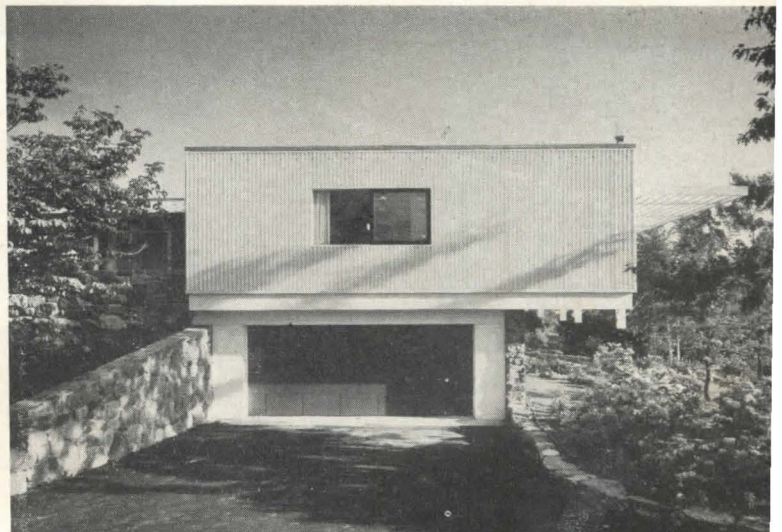
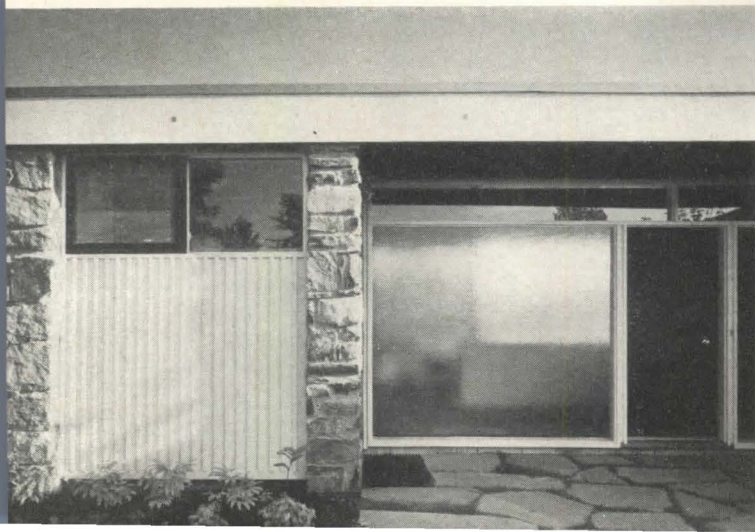


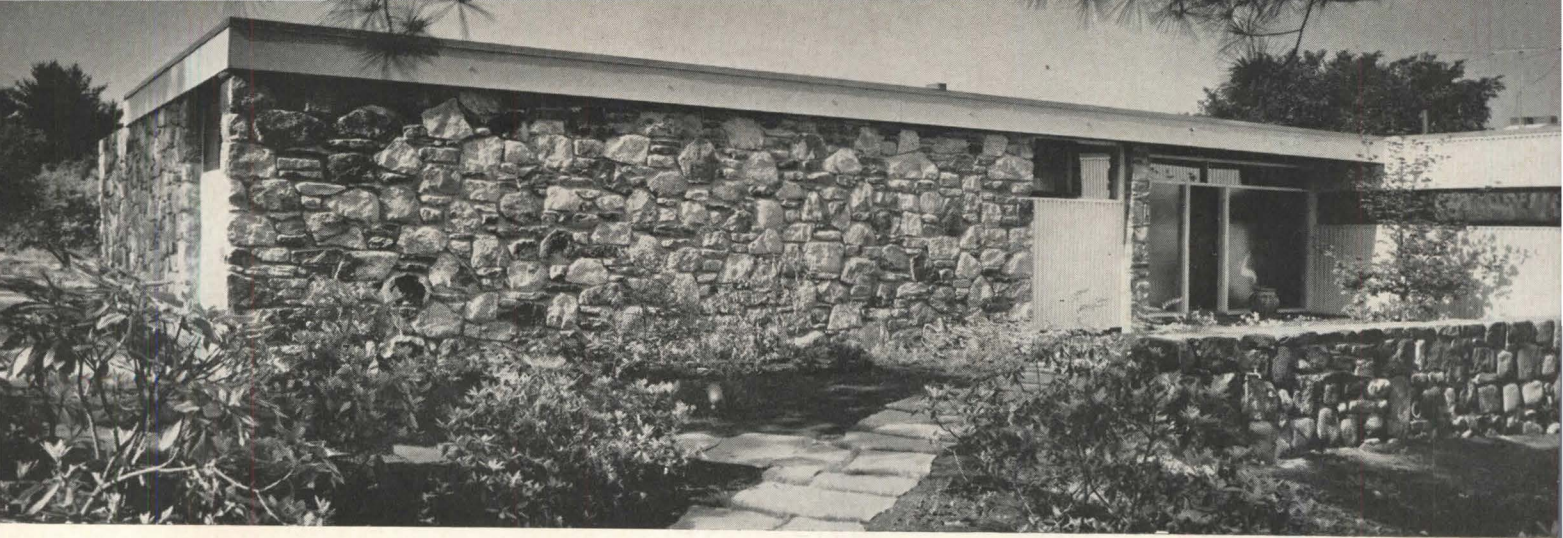
Ben Schnoll

LIVING AND SLEEPING AREAS in this house are separated by an entrance hall flanked by terraces. This "bi-nuclear" plan, as the architect calls it, was the result of a hillside site with the main view to the west and the owners' specific requirements for the bedroom wing.

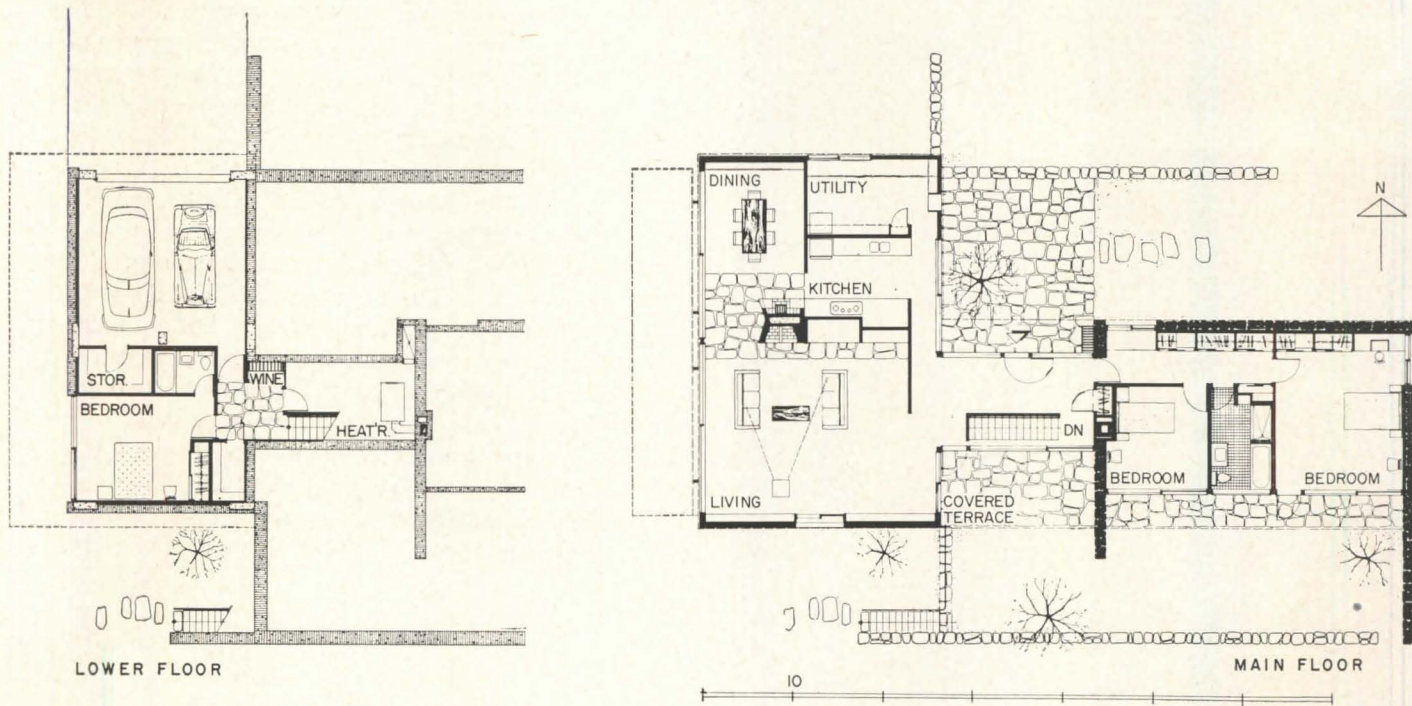
Living and dining room face the view, protected from the sun by an exterior sunshade (see page 177); the two bedrooms and one bath, meeting the owners' demands, open on one side to a dressing-room corridor and on the other to a court where floor-to-ceiling windows are protected by a low stone wall and planting. The downward slope of the site toward the view to the west was used to provide a guest room and bath on a lower level; completely separate from the rest of the house, it can serve equally well as a maid's room.

Even more interesting than the plan, however, is the reasoning behind this house. The owners are unusually interested in and understanding of contemporary architecture: this is their third house, not including one designed for them by Frank Lloyd Wright, but not built. Since they were quite happy with the house they had, and their space requirements had not changed, Mr. Breuer naturally asked them why they wanted to build another house. They answered, quite simply, that they admired Breuer's architecture so much that they wanted the experience of living in a house of his design.





HOUSE IN MASSACHUSETTS





Ben Schmall



Breuer answered his clients' challenge with a house well adapted to its site and answering all of the owners' requirements. Construction is reinforced concrete and wood frame on concrete block foundation; exterior walls are fieldstone veneer and asphalt tile; ceilings are plaster on upper floors, exposed concrete on lower. Sunshade on windows to west is supported by stainless steel cables attached to four masts along west façade. Living room fireplace, again meeting owners' requirements, has charcoal grille on dining room side. Photos: opposite, top — main entrance; opposite, bottom — front terrace, west elevation; above — sunshade at west; left, stairs to south terrace



MICHIGAN HOUSE PUTS BEDROOMS ON LOWER LEVEL

*House for Mr. and Mrs. Robert Feldman, Benton Harbor, Michigan
George Fred Keck — William Keck, Architects*

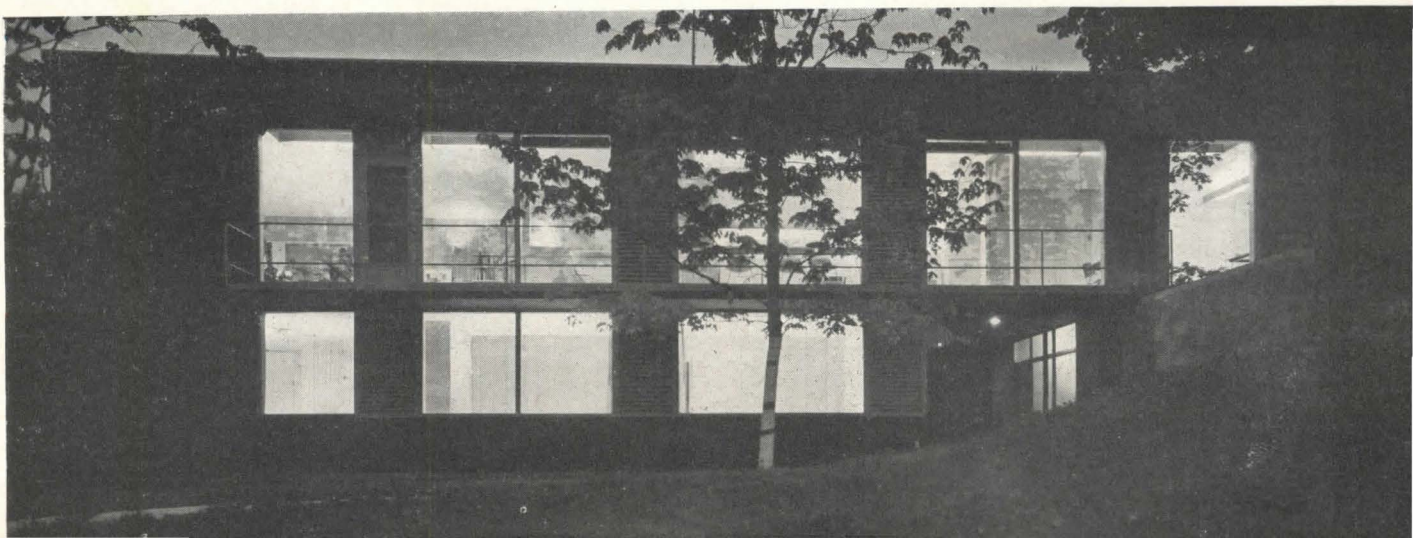
Contractor: Ken Gustafson

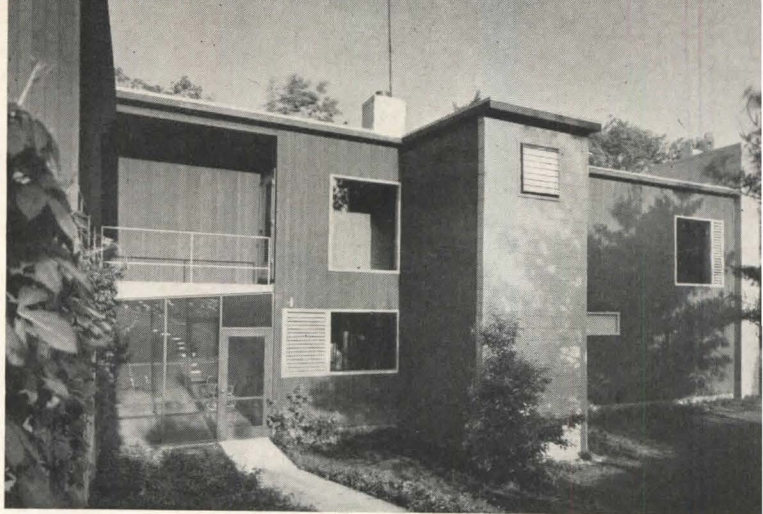


Herrlin Studio

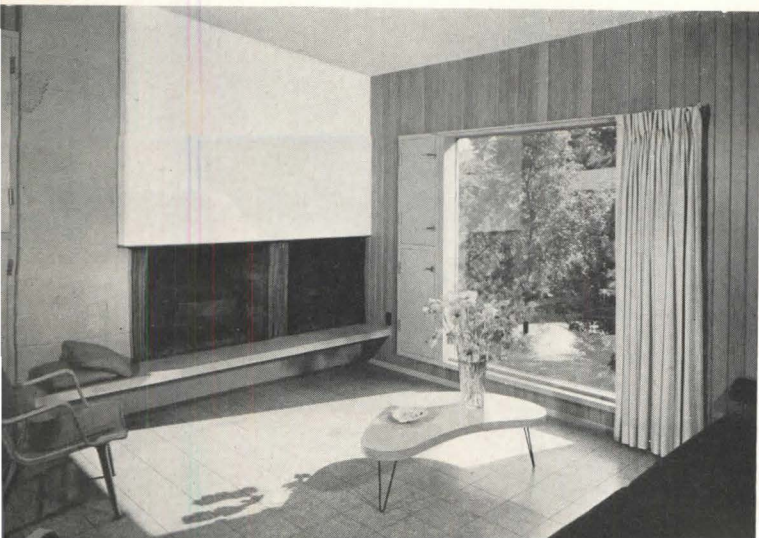
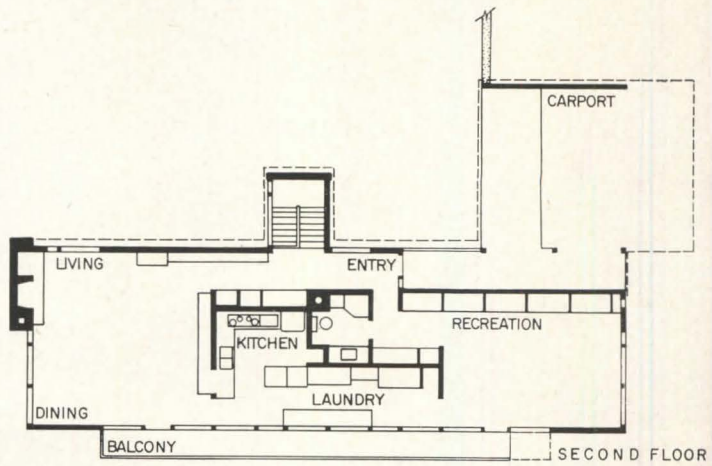
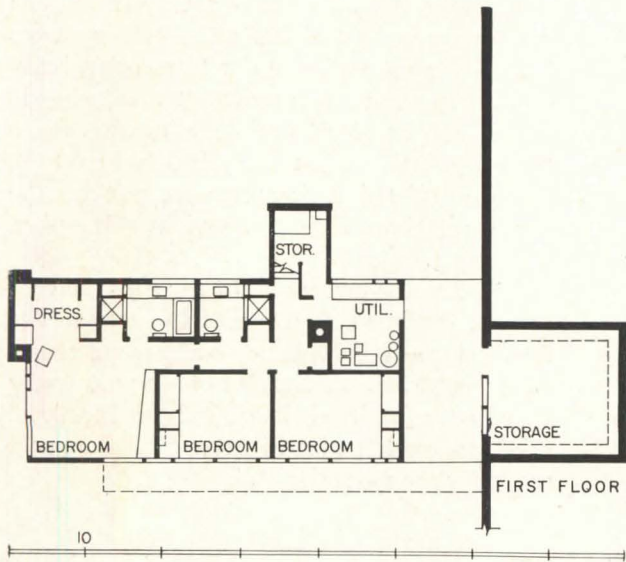
SITE CONDITIONS made an inverted two-story plan the only logical one for this house. The site is on the edge of a steep bluff overlooking the St. Joseph River; its undulating sand dunes fall off from street level, and its main view is to the west; the existing trees had to be preserved in order to secure privacy on the comparatively narrow lot with only 100 yards between street and building site. Since the main entrance obviously had to be on the upper level, the bedrooms were put on the lower, all three facing the view. (See plan, next page).

As far as the owners and their sons are concerned, the house is a complete success. The family dog — a dachshund — still is not reconciled, however: the architects report sadly that “the waxed cork floors and the floor level glazing have left him in utter confusion, and ready for the psychiatrist.”





MICHIGAN HOUSE



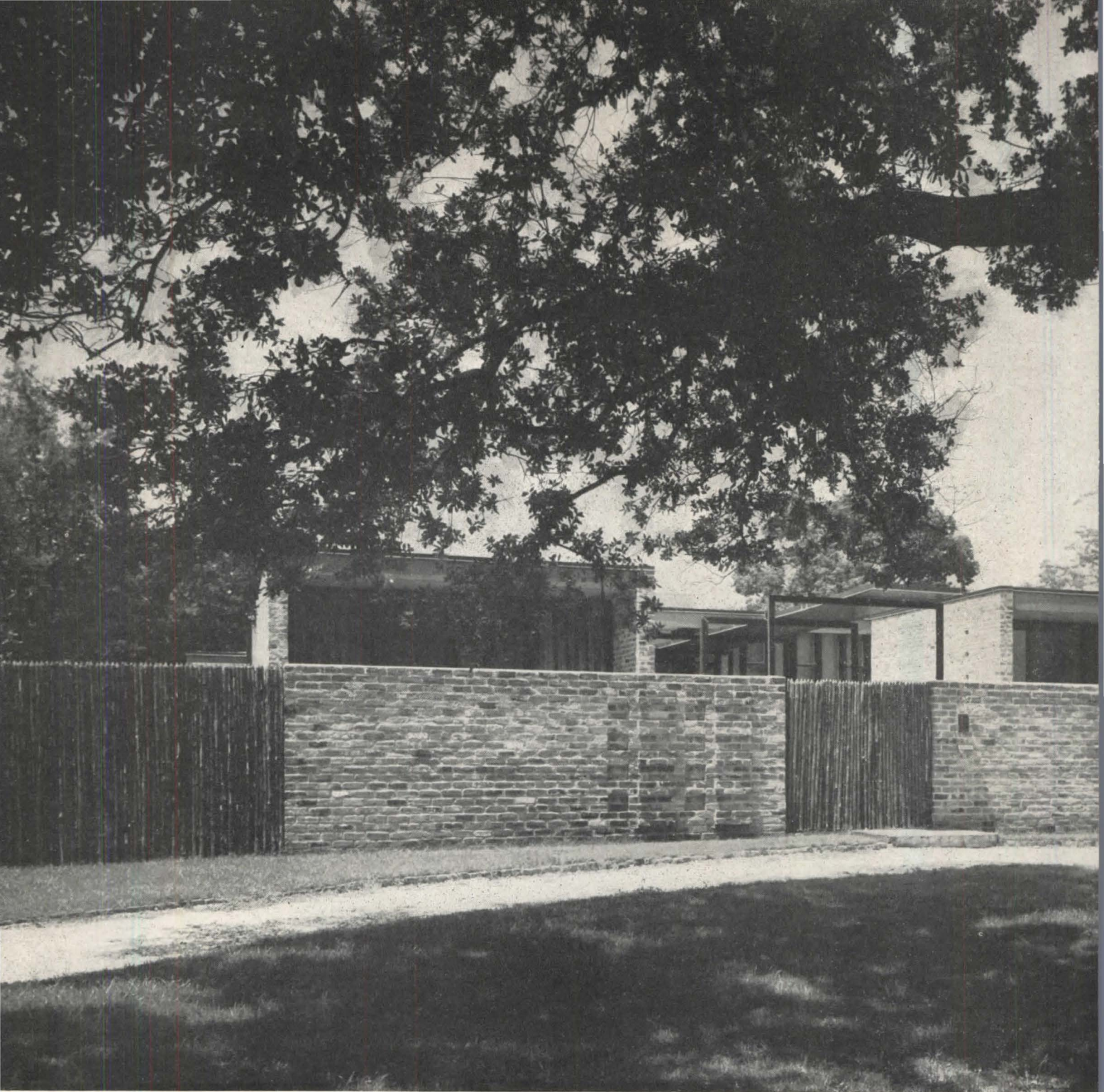


Herrlin Studio

To quote the architects again, "an inspection of the plans of this house will indicate its amenities. The recreation room doubles as a guest room, with a full bath nearby. The breakfast table along the floor-length double-glazed units near the kitchen makes a good place not only to eat, but also to observe the abundant wild life in the neighborhood of the river and adjoining swamps. The continuous semi-indirect fluorescent light running from the living room to the recreation room is a feature. . . . Television is in the recreation room; this room, the outside terrace and the living room all can be easily served from the kitchen, since all are on the same level and the kitchen is central"



Construction is wood frame on concrete block foundation; exterior walls are stained redwood. Interior walls are stained and varnished redwood or painted plaster, floors are concrete slab on grade or wood joist. The house is insulated both thermally and acoustically, and is termite proofed. Photos: opposite page, top—carport on upper level, and main entrance on lower level; opposite page, bottom — one end of living room, recreation room; this page, top — two-story bedroom wing; above — end of dining area showing pass-through to kitchen and looking toward recreation room; left — a corner of the kitchen. Furnishings throughout were selected by Mrs. Feldman, with a few suggestions from the architects



LOUISIANA HOUSE COMBINES PRIVACY, OPEN PLAN

*House for Mr. and Mrs. Harold Forgetston, New Orleans, Louisiana
Curtis & Davis, Architects and Engineers*

Mechanical Engineers: De Lanreal & Moses General Contractor: Haase Const. Co. Sculptor: Jack Hastings

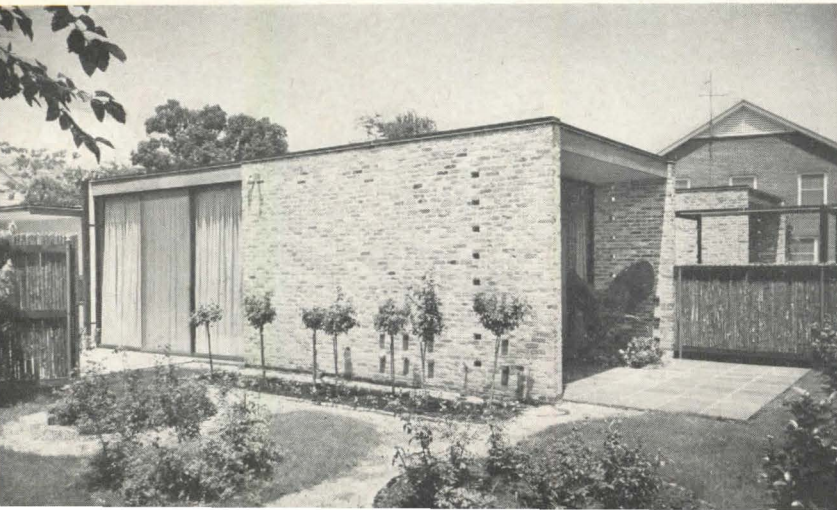


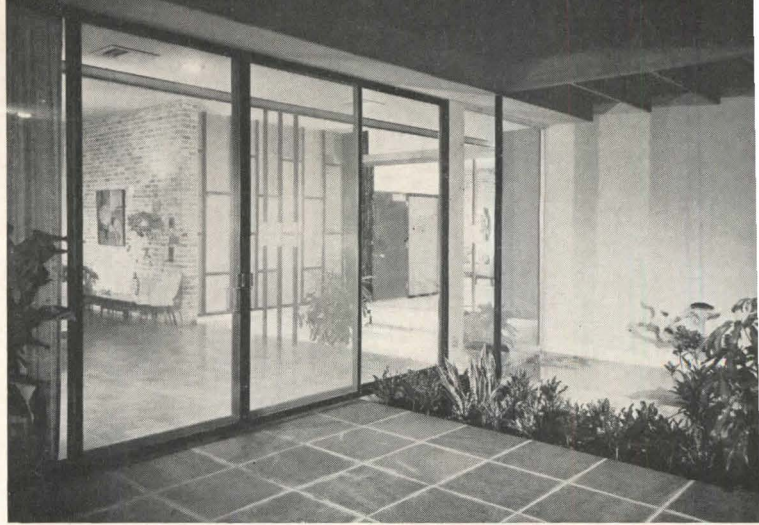
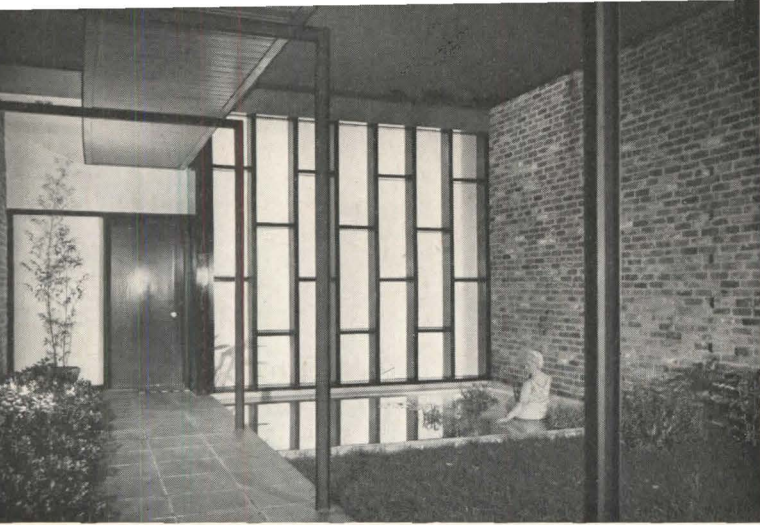
Ulric Miesel

THAT PRIVACY AND AN OPEN PLAN are the chief characteristics of this New Orleans house is obvious even to the casual passer-by. Nothing could be more indicative of privacy than the high wall extending the full length of the street frontage; and nothing could be more indicative of an open plan than the irregular roof-line which is the only part of the house visible from the street.

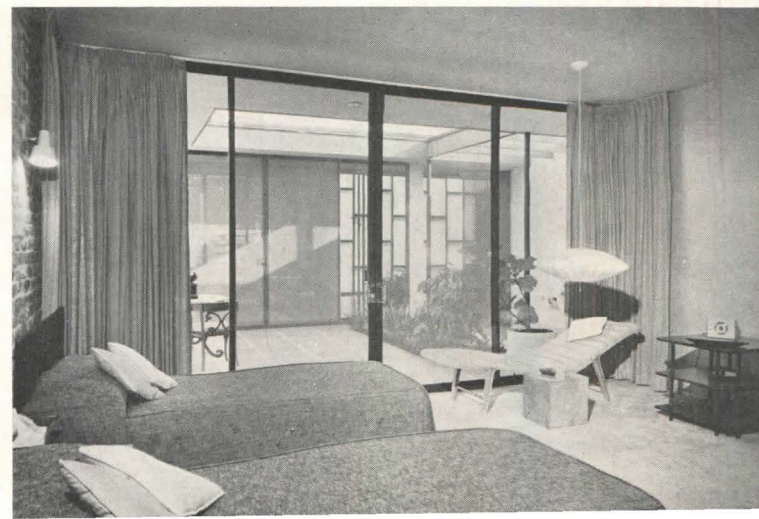
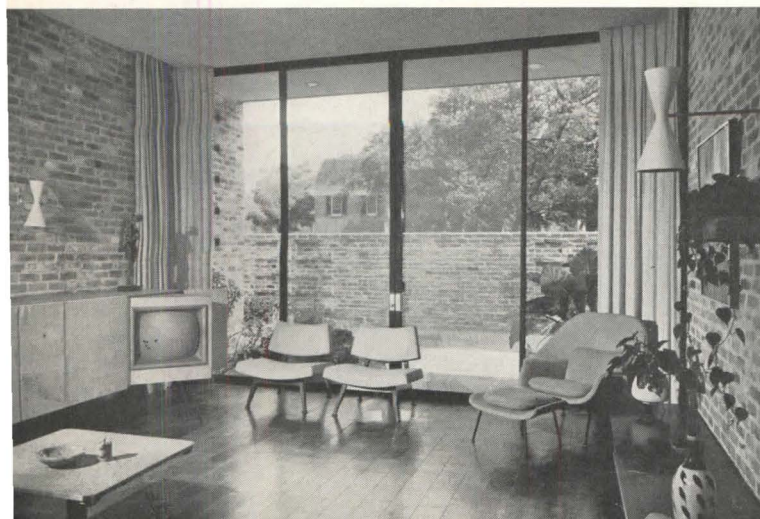
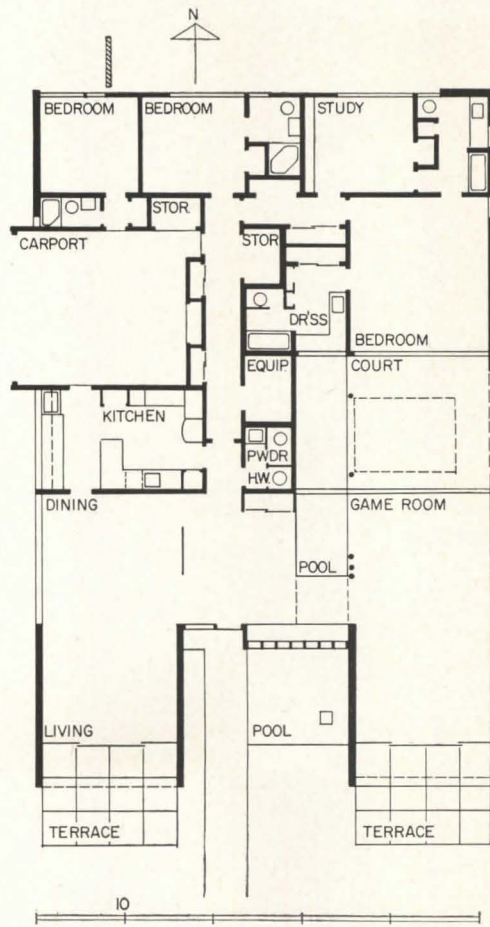
The owners do a lot of entertaining, and wanted a house flexible enough to accommodate both very small and very large groups. The living-dining area and the game room, therefore, were planned for use either individually or jointly, and a large but still compact kitchen was provided. Twin terraces (see plan, next page) and an unusually large entrance hall augment the entertainment area.

Screens of one sort or another protect the house on every side: brick walls, 6 ft high, on front and rear; chain link fences, camellia bushes, vines, and cedar on the sides. The house is completely air conditioned and has an intercommunication system with master stations in all rooms and at the front and rear entrances, as well as an electric release for the front gate. The driveway gates and garage doors are electrically operated from the owner's car; the driveway gates can also be activated from a push button in the kitchen for package deliveries, etc.





LOUISIANA HOUSE





L'Iric Meisel

One of the most interesting features of the house is the pool which meanders from entrance court through the vestibule and on into the game room court. The pool, the architects report, is "well stocked with a collection of the hardier species of tropical fish and is a great source of enjoyment." A pump and filler system keeps the pool water continuously circulating.

Exterior walls are brick, with some sections patterned; the brick is carried into the interior in some rooms, but most interior walls are birch plywood with a pickle finish. All cabinet work is birch to match the wall paneling. Ceilings are plaster throughout, and floors are variously marble, cork or slate



The game room has a built-in television set, radio and high-fidelity record player; the television set is hinged so that it can be seen from any part of the room, and the record player-radio can be controlled from substations in the dining room and master bedroom. The master bedroom has separate bathing and dressing facilities for husband and wife and an adjoining study which doubles as informal sitting room. Photos: opposite, top — main entrance and vestibule; opposite, bottom — game room and master bedroom; this page, top — dining room; above — game room court; left — kitchen. House cost \$92,000, excluding land, landscaping and fees, but including all fences, terraces and sculpture



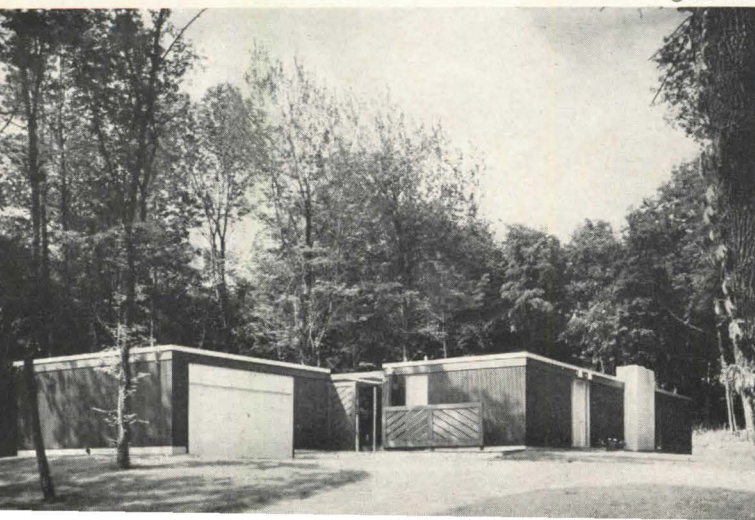
CONNECTICUT DEVELOPMENT HOUSE IS VERSATILE

*House for Wiley Development Corporation, New Canaan, Connecticut
Philip C. Johnson, Architect*

Contractor: Varian Construction Co. Interiors: The New Store, Inc.



© Ezra Stoller



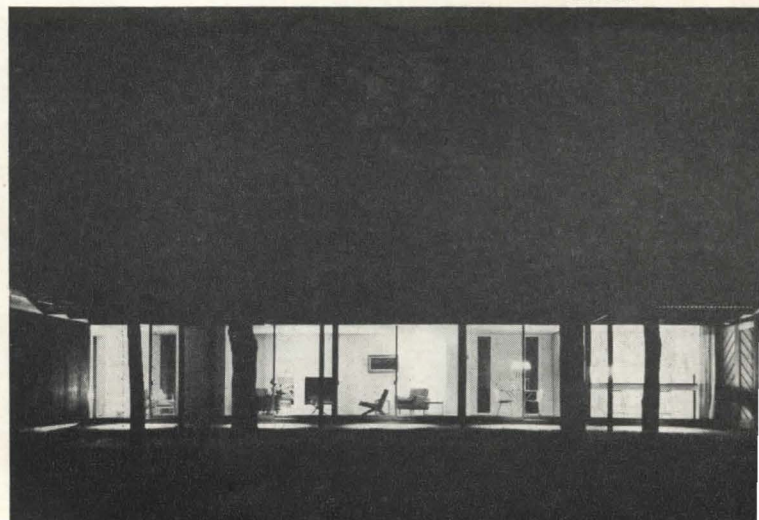
© Ezra Stoller

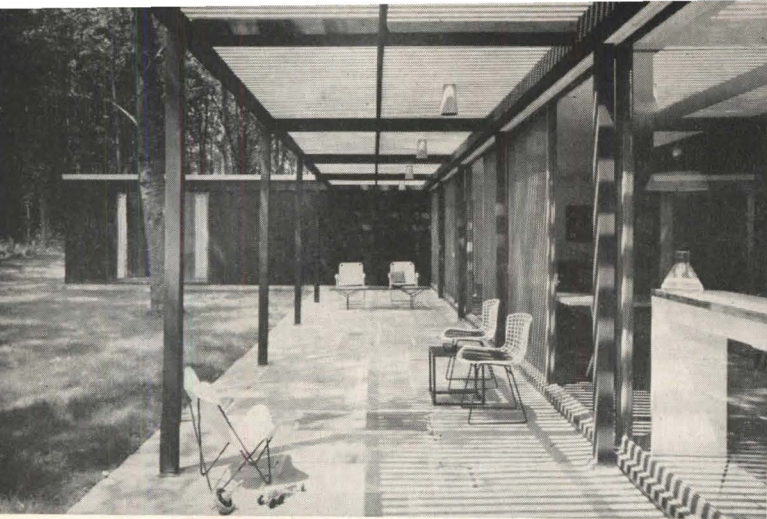
VERSATILITY AND PRIVACY were the major considerations in the design of this suburban development house. The plan had to be flexible since the needs of the future owners were unknown; it also had to be easily adaptable to other sites. Privacy was no problem for this particular house — the site measures over two acres — but would be an important factor if the same plan were used on the average suburban lot.

The solution was an L-shaped plan, with the garage turning the L into a U. This provided a secluded central court (see next page) to which the entire living area and the master bedroom open. Such a plan, as the architect points out, could be used on a relatively small lot without loss of privacy or outdoor living space.

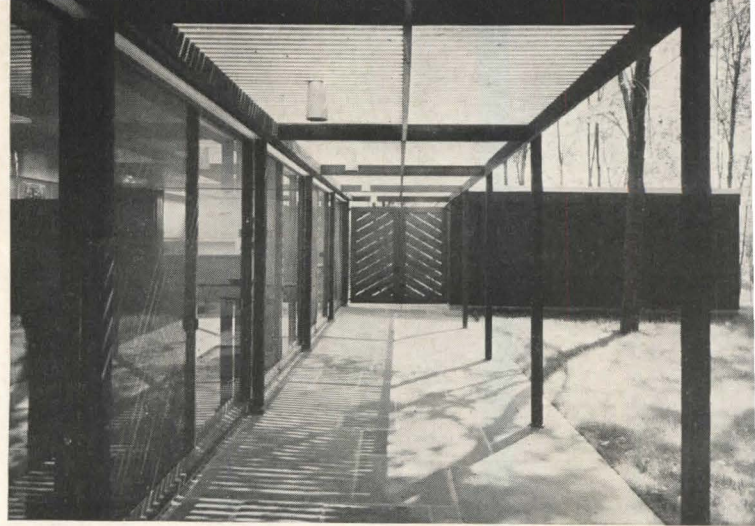
Living and sleeping areas are in separate wings. The master bedroom is at the far end of its wing, and has its own bath. The other two bedrooms, planned with small children in mind, offer ample play space and easy access to the outdoors. The location of these two rooms should keep toys and youthful activities out of the adult living area.

Gene Heil



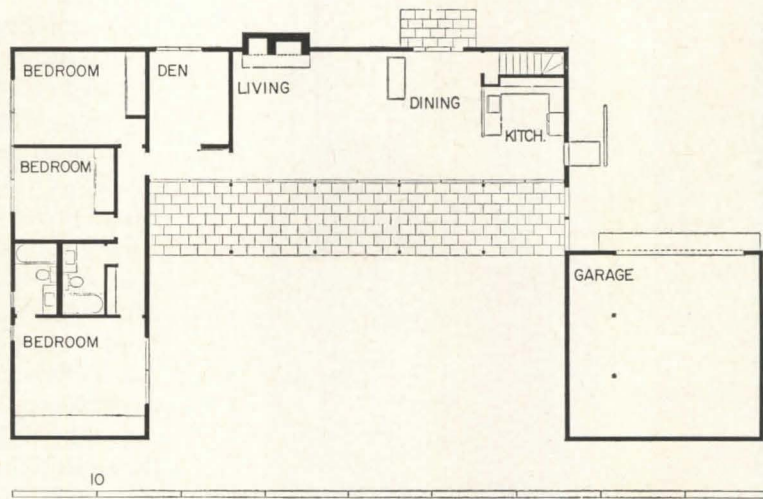


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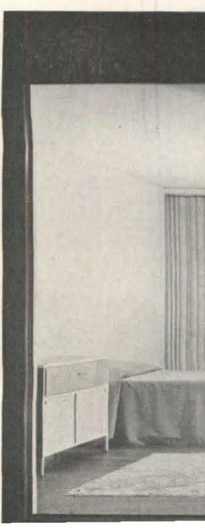
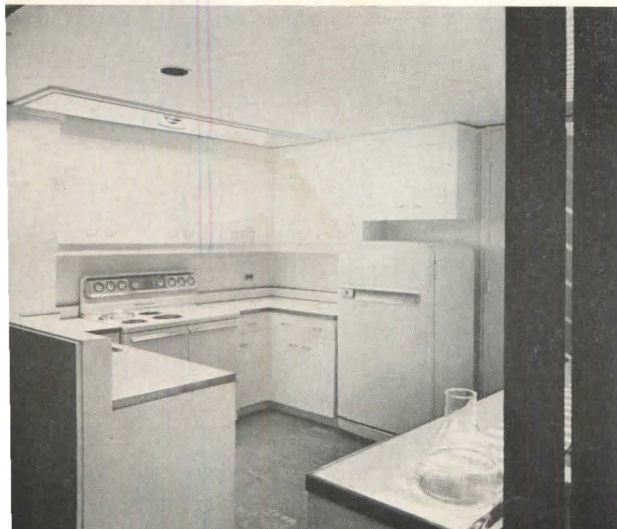
Gene Heil

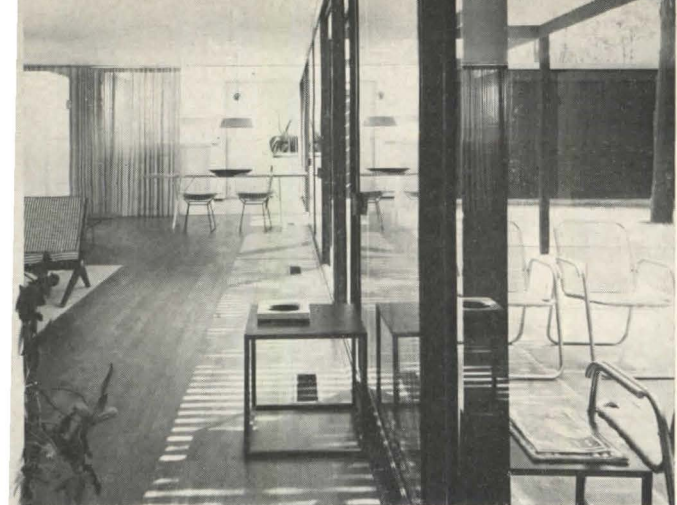
CONNECTICUT HOUSE



© Ezra Stoller

Gene Heil

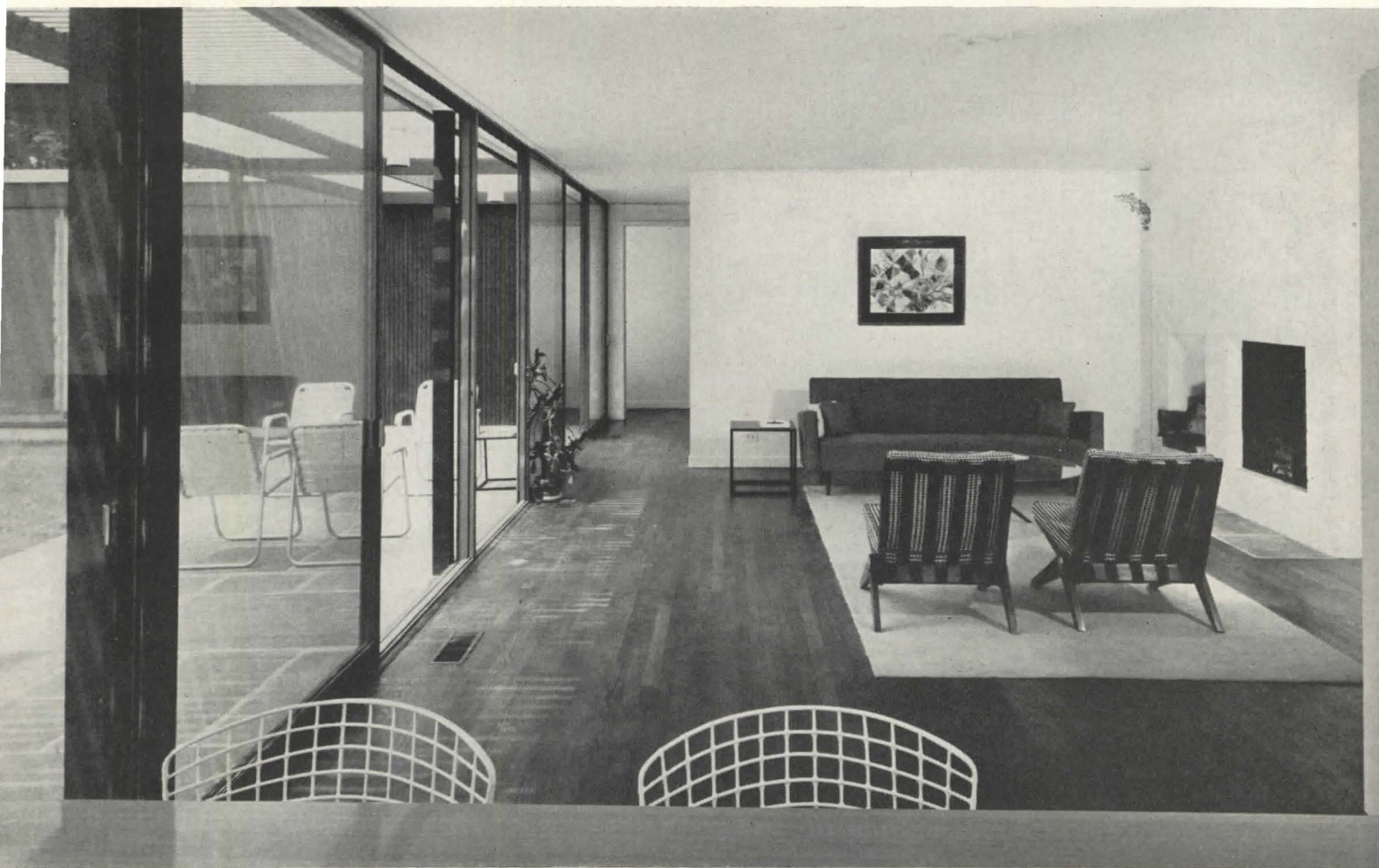




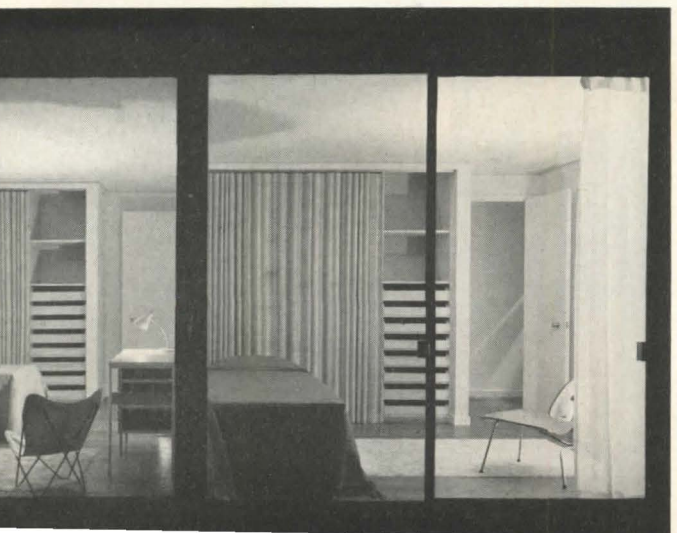
© Ezra Stoller

© Ezra Stoller

The best feature of this development house is, of course, the secluded court to the rear, and the plan makes the most of it: even the den and the kitchen share the view through the floor-to-ceiling glass wall of the living-room wing; and the two smaller bedrooms, while not facing the terrace, have quick access to it. Some owners might object to the "traffic corridor" through the living area which resulted, but most would consider it a small sacrifice for the privacy and outdoor living space provided by the plan. The den could serve as an extra bedroom if necessary, or equally well as a playroom

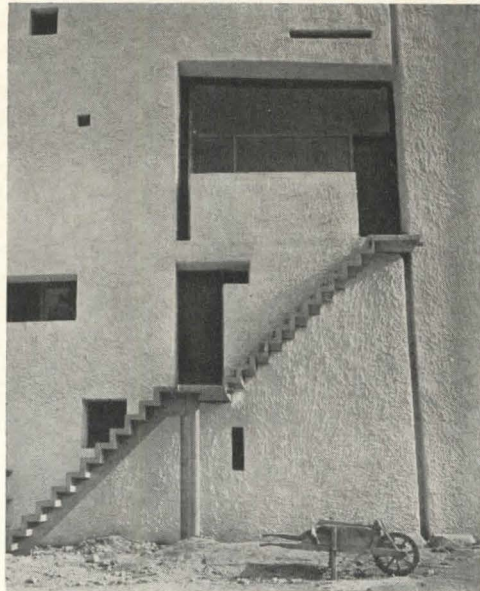


Gene Heil



Construction is post and beam on concrete block foundation. Exterior walls are plywood, stained a charcoal brown; trim is light gray. Interior walls and ceilings are sheet rock, painted, and floors are oak. Non-skid tile is used in both baths. The house cost \$45,000, exclusive of agent's commission. Photos: opposite page, top — the court, looking toward bedroom wing and toward garage; opposite page, bottom — kitchen and den; this page, top — living room looking toward dining area; above — opposite view of living room; left — the two smaller bedrooms, showing built-in banks of drawers which are features of all bedroom closets





Magnum Photos Inc. (opposite page: Henri Cartier-Bresson)

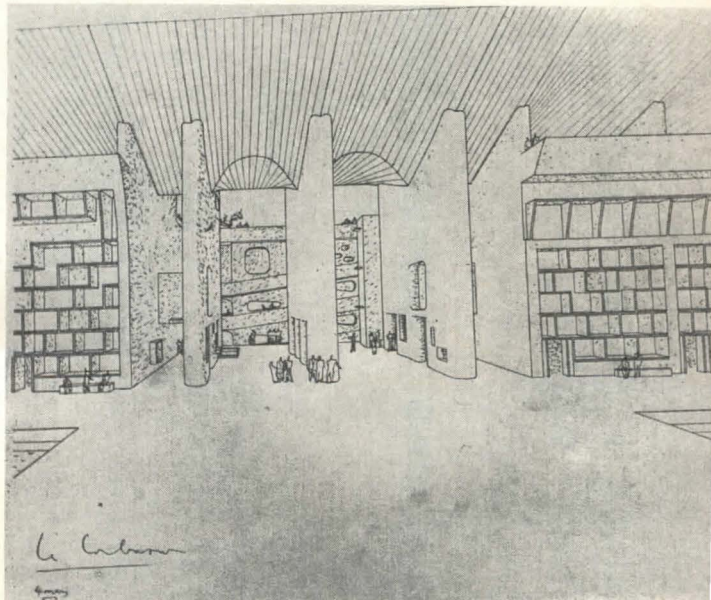
THE NEW CORBUSIER

HIS CHAPEL AT RONCHAMP dispels any remaining doubt that a new Le Corbusier has appeared.

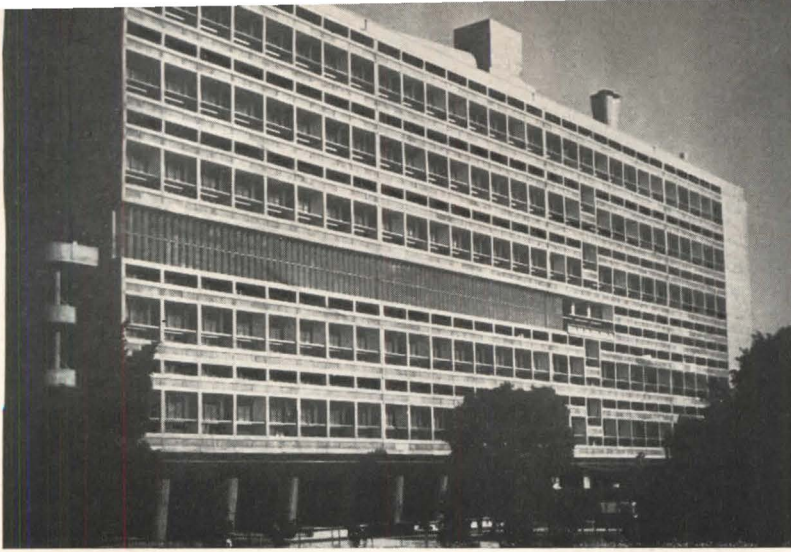
Culminating earlier stylistic explorations at Marseilles and Chandigarh, in these projects polychrome sculpture has become architecture. Their forms are lively and baroque, tactile interest is accentuated to relief, colors are strong and dominant. But the change in Le Corbusier's architecture is more profound. It reveals a warmer, more humane view of individual personality and of family life than was expressed by the earlier, rationalistic Le Corbusier for whom the house was merely a *machine à habiter*.

Architecture since the war has outdistanced the doctrinal phase of its earlier, revolutionary years. We are still attempting to describe what has succeeded it. To Le Corbusier, as to many European intellectuals, the Nazi occupation disclosed the true face of thoroughgoing collectivism. He saw that the ideal world he had earlier conceived was one in which he could not live. A parallel American reaction is rooted in different causes: here the bleak social schemes of the prewar years have been succeeded by a new humanism which takes its accent from the discoveries of the social sciences. Removed from such influences, Le Corbusier is responding intuitively like the artist — or perhaps like the poet his forthcoming book, *L'Angle Droit*, will show him to be. Beyond their architectural significance, or their recognition of broader artistic objectives, Le Corbusier's postwar buildings have a special biographical interest. Their creative effort is matched

by Frederick Gutheim

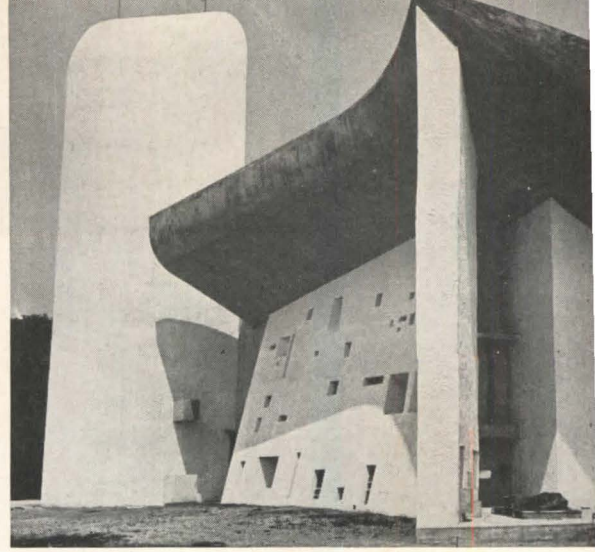


Facing page, L'Unité d'Habitation, Marseilles. This page, top, Chapel of Notre Dame, Ronchamp; above, study of entrance, High Court of Justice, Chandigarh



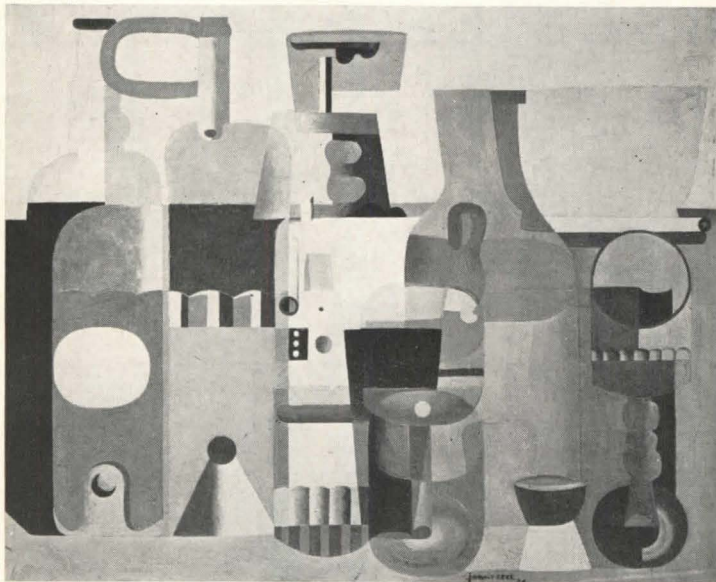
Brassi

Left, L'Unité d'Habitation, Marseilles: the uniformity of earlier work replaced by aggressively articulated variety. Center, Chapel, Ronchamp



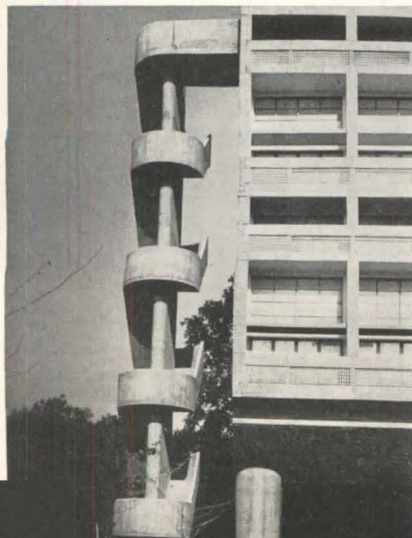
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THE NEW CORBUSIER

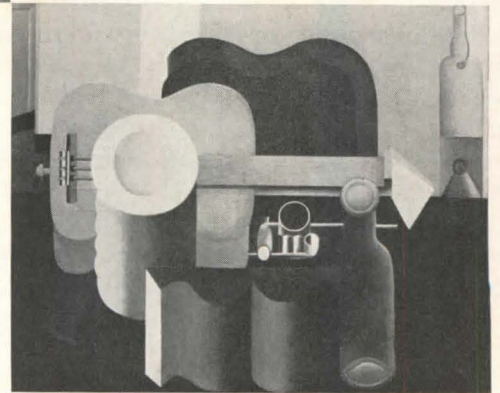


Nature Morte du Pavillon de l'Esprit Nouveau, oil, 1924. Rosenberg Galleries

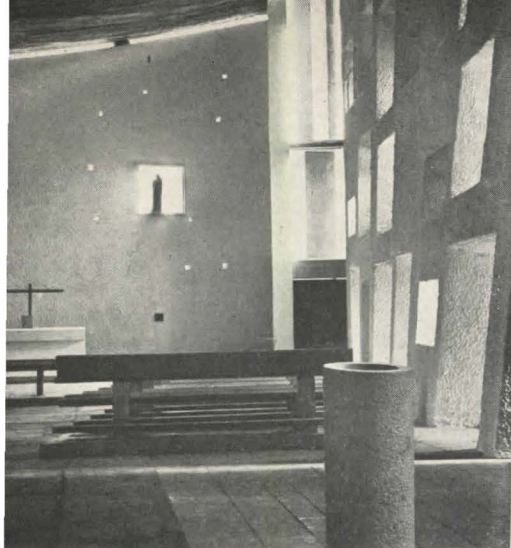
Fire escape, Marseilles



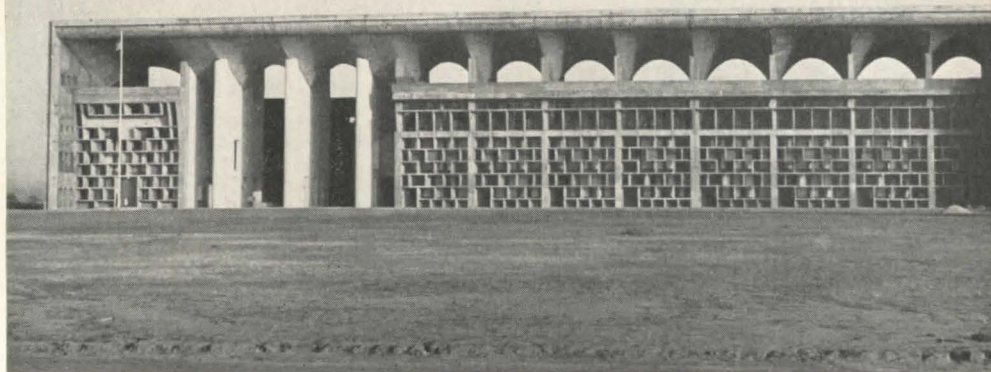
Brassi



Still Life, oil, 1920. Museum of Modern Art



Magnum Photos Inc.



Arthur Drexler

Left, Chapel interior: illumination inspired by a basilica in Istanbul. Right, High Court of Justice, Chandigarh: toward architecture as polychromed sculpture

by a lonely splendor and experimental daring. There has been little critical effort to understand them. The contrast between the old and the new Le Corbusier is total. It is a contrast found equally between what he designed and what he wrote. An immediate parallel suggests itself with his contemporary, Picasso, not only because his career has been marked by a series of major changes; but for his specific experiments in three-dimensional ceramic forms. Or one thinks of the late Fernand Léger, whose later career was a long struggle for emancipation from abstract art. But one thinks of no other architect, in his full maturity (Le Corbusier is now 68) who has dared to contradict all he has earlier preached and accomplished, and to strike boldly into new territory.

The conservative young Swiss architect, who took the name of one of his grandparents and called himself Le Corbusier, revolted against the Ecole des Beaux Arts in a highly disciplined fashion. Few romantic excesses, much singleness of purpose, have marked his career. The typical image he presented was not "le diable Corbu," but (as Léger observed) a fastidious man in a tightly buttoned dark suit wearing a derby hat, carefully riding a bicycle. His paintings, always more characteristic and personal than architecture, had been inspired by Ozenfant's purism, forms of geometric origin, or parts of machinery, and Léger objected to the timidity of their pastel colors. This curious and baffling mixture of the dedicated and puritanical revolutionary had its parallel in Le Corbusier's ideas of life as well as of art. His revolt against Swiss bourgeois stuffiness was hardly less complete than Rousseau's, and into his scrap pile went the institutions of marriage and family life. His was bohemianism with a purpose. All this was reflected in the highly refined and rationalized architecture he created, and in the stylistic doctrine which influenced so many young architects who seized upon it as they came to maturity in the period between the wars — and who, today, are at the peak of their creative powers. And all this is what Le Corbusier has now rejected.

While the impulse that led Le Corbusier to make

this dramatic change in architectural style may be buried deep in psychological motivations, the form it has taken is more exposed. The change itself is less abrupt. I had always been fascinated with Le Corbusier the painter-architect; and when I first met him in Paris in 1945 I was startled to find him at work on paintings which denied not only his earlier architecture but his earlier painting. Human figures, naturalistic forms, bolder colors, palette knife technique, composition in depth — these were characteristics of his art as it had developed in the four years of enforced idleness during the Nazi occupation. War and postwar experiences also revealed the strength of the family as an institution. But as his postwar activity commenced with the plans for the hoped-for port city of La Pallice, there was no evidence of any corresponding change in architecture: it continued along lines laid down in the north African projects of the prewar years. What had been a unified style, expressed in architecture and painting alike, a style of revolt and — however poetic — of rationalism, was then clearly threatened by a schizoid division.

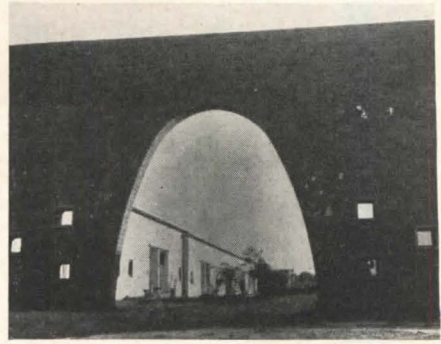
To bring his postwar architectural design abreast of the advances he had made in painting was, I believe, Le Corbusier's major artistic problem, the watershed divide in his architectural career.

There are many indications that he appreciated this necessity and worked toward this reconciliation.¹ His effort to infuse the United Nations headquarters design with the new esthetic by supervising the decoration of its interiors with the works of the greatest living artists may have foundered as much on the difficulties of its formulation, or doctrinal uncertainties, as upon bureaucratic timidity, architectural rivalries or misunderstandings. But whatever foreshadowings of the new style may be found, it was authoritatively expressed first in the Marseilles apartment designs. The emergence of the new esthetic thus belongs in the period about 1948.

When he left behind the two-dimensional world of abstract purism, he ventured into painting which was

¹ *Le Corbusier 1946-1952 (Vol. 5) (Zurich, 1953).*

THE NEW CORBUSIER

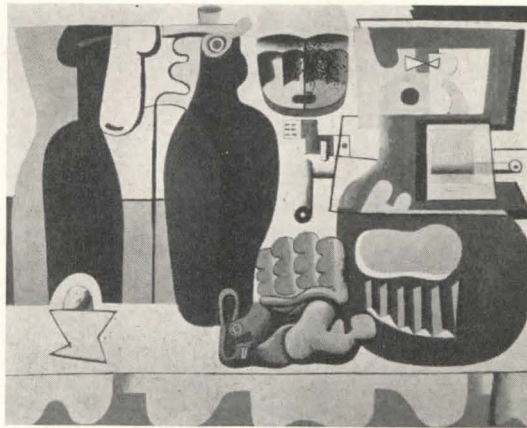


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An individualism which survives collaboration: above, gate at Chandigarh. The artist responsible for execution and supervision: below, clockwise: centermounted enamelled door to the Chapel; Verres et Bouteilles sur une nappe, oil, 1929. Rosenberg Galleries; brilliantly colored, artificially lit corridor — itself a sculpture — at Marseilles: brise-soleils at Chandigarh. Facing page, baroque form: roof structures at Marseilles

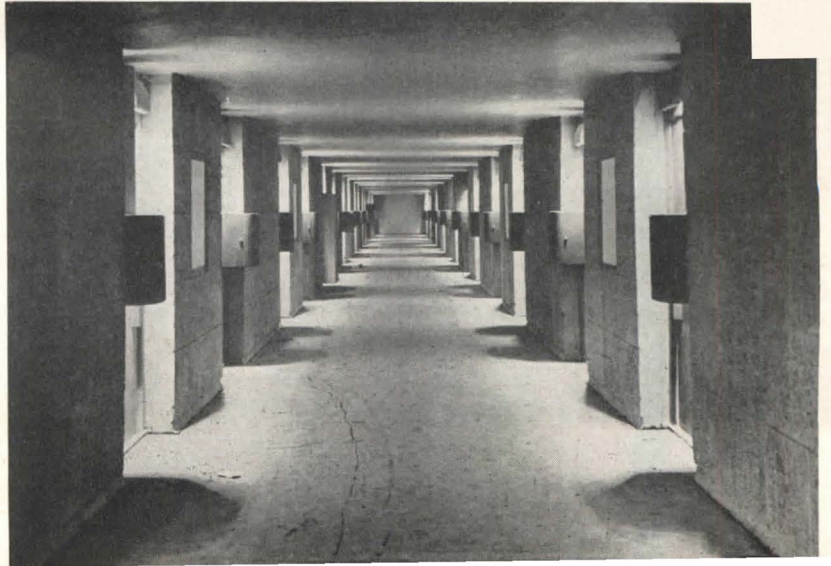
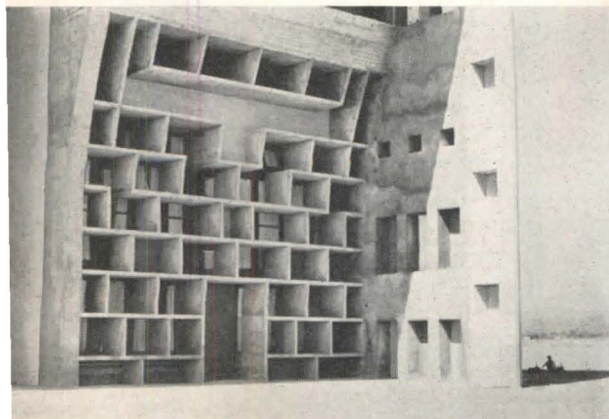


Magnum Photos Inc.



Arthur Drexler

Bronze



composed in depth. As early as 1945 I saw in his studio what he called "design for sculpture," but my notes from those years record that he had never done sculpture and thought he probably never would. Yet sculpture for Le Corbusier appears to have become the bridge which allowed the world of the painter to communicate its plastic researches to the world of architecture.

Genius searching for nourishment feeds on what its immediate environment offers and is inexplicably selective. Little in the highly refined, intellectualized atmosphere of Paris could have provided Le Corbusier with the experience he was seeking. The opportunities opened up by his visits to New York at the time the United Nations headquarters was being designed thus acquire a singular importance.

During those years the decisive influence appears to have been exercised by a young, friendly Italo-American sculptor, Costantino Nivola, whose New York studio Le Corbusier used, and at whose Long Island cottage he spent many weekends. Nivola, probably best known for his warm and technically ingenious sand-concrete reliefs in the Olivetti showroom in New York, was then working as a typographer and art director of *Interiors* magazine. He is now on the faculty of the Harvard Graduate School of Design.

At this point, with the assistance of Nivola and other professional sculptors who aided in translating Le Corbusier's ideas of polychromed sculpture into three dimensional actuality, the gap was bridged between his plastic research of the war years and its application in architecture. In the end, his painting and architecture were once again unified.

Of greater importance, perhaps, was Le Corbusier's first association with an artist of the first rank who lived an utterly normal family life. Sharing this life, playing with the Nivola children, his emancipation from his own reaction from Swiss bourgeois ideals undoubtedly began here, and with the most profound application to the Marseilles apartment project and to Chandigarh. A new humanism, expressed in the requirements of the household and the community, is still being built upon this moral change.

The effort to apply these esthetic and moral ideas to architecture has not been easy. In the successive studies for the Marseilles apartment, *L'Unité d'Habitation*, the architect systematically discarded the thin structural elegance of his earlier designs, the abstract regularity which for him had been synonymous with industrialized construction, the white walls. In their place he developed a sculpture in concrete, fully modelled and with great tactile values. Uniformity was replaced by a variety in dwelling types, aggressively articulated in the slab elevations. Finally, brilliant, "thundering" colors were introduced.

Although but recently completed, the chapel of Notre Dame at Ronchamp belongs next in the sequence of Le Corbusier's major new works. This project, like the chapel at Vence decorated by Matisse, or Fernand Léger's stained glass experiments at Audincourt, are



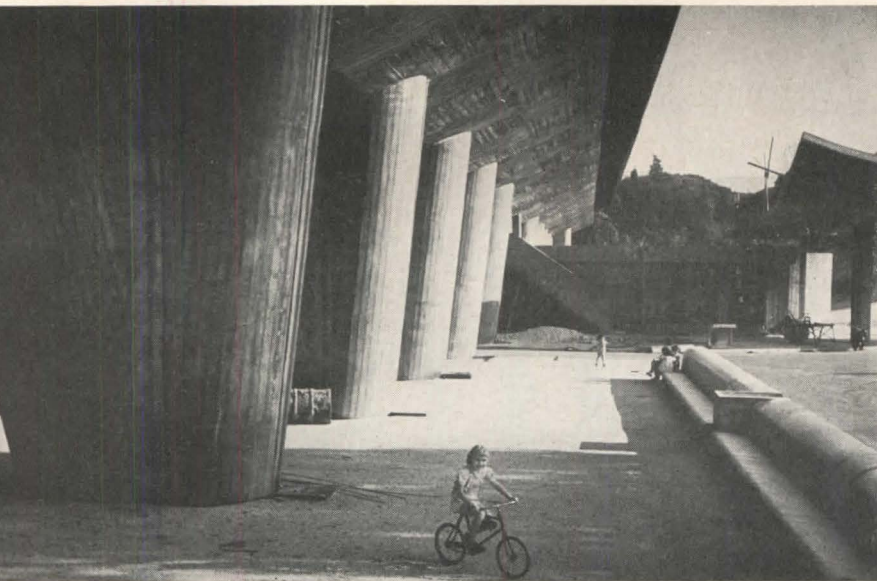
Brass

part of the widespread liturgical arts renaissance initiated by the Dominican Priest, Le Père Couturier, who died a year ago.² Reference to this movement to integrate religious art with the efforts of today's greatest artists suggests that the change in Le Corbusier's work is not altogether self-generated. The Ronchamp chapel has been widely hailed as a work of architectural genius — but as an isolated work. Labatut says it shows Le Corbusier can break his own rules. Zevi says the architect contradicts himself. No one as yet discussed this remarkable religious structure in the context of Le Corbusier's new architecture; or has assessed it in broader terms of the liturgical renaissance of which it is probably the most significant accomplishment.

From the center-mounted enamelled door painted by the architect, one penetrates the mystery of a unique architectural space. Like a great many of Le Corbusier's architectural creations (for instance, the forms on the roof of the Marseilles apartment), the interior of the Ronchamp chapel, and its illumination in particular, are inspired by Mediterranean sources, in this case a basilica at Istanbul. Through the south wall of the chapel a controlled and graduated series of windows in stained glass admit the light. The perforated effect lies in the vicinity of such generous color baths as Perret's Notre Dame de Raincy, Duintjer's church at Amstelveen, Labatut and Girard's projected chapel; or Frank Lloyd Wright's Florida Southern chapel, with its stained glass inserts in the concrete block walls.

To the east a concave wall under an overhanging roof shelters an open-air church, fitted with pulpit and choir. Thus provision is made for the handful of daily worshippers, the few hundred who attend Sunday services, and the thousands of pilgrims who flock to this traditional pilgrimage center on occasion. A revolving Madonna (rather better than the two-way crucifix I have seen in one center-altar plan) serves both inner and outer church. All parts of the church have

² A biographical sketch of this remarkable man was published in *L'Art Sacré*, May-June, 1954. This journal of limited circulation deserves to be better known in the United States, especially among church architects.



Brassf



Arthur Drexler

been conceived in the most elementary and economical manner. There is no "decoration." White-washed concrete walls suffice, relieved by splashes of color. There are few benches, since all but a handful of parishioners are expected to stand or kneel during the service.

Despite these austere conditions a work of art has resulted chiefly because the architect himself has executed and supervised the whole of this work, and has infused it with a sculptural quality. The means appear superficially to be those of peasant architecture everywhere, but the sophisticated structure and the highly controlled art stamp it immediately with an individual authority transcending vernacular. In its plasticity, this is the building which more nearly than any of his other work unites Le Corbusier the painter and the architect.

From the single authorship of Ronchamp one moves to Chandigarh, the capital of East Punjab, whose creation has caused Albert Mayer (not to say Matthew Nowicki) to be honored in the United States, Maxwell Fry to be honored in Great Britain, and Le Corbusier to be honored in France! This is hardly the place to disentangle the work of these several and variously gifted architects. Le Corbusier visited Chandigarh twice a year for periods of several weeks during the three years that work on the capital has been proceeding under Fry's direction. The changes he made were all in the same two directions: toward greater expression of architecture as polychromed sculpture, and toward greater recognition of housing as a framework for family life. The stiffness which is apparent in some completed parts of the city must be attributed to others; and it is a reasonable, if rather surprising, assumption that save for Le Corbusier's intervention this formalism would have been even more pronounced.

Chandigarh is far from explained when attention is called to its primitive construction in brick and simple concrete, its response to climate, or its expression of peasant culture. The city itself, and in particular the buildings which compose its governmental core — the Governor's palace, the supreme court, assembly and secretariat — have been invested with Le Corbusier's

new architectural spirit. Here is an individualism which survives collaboration.

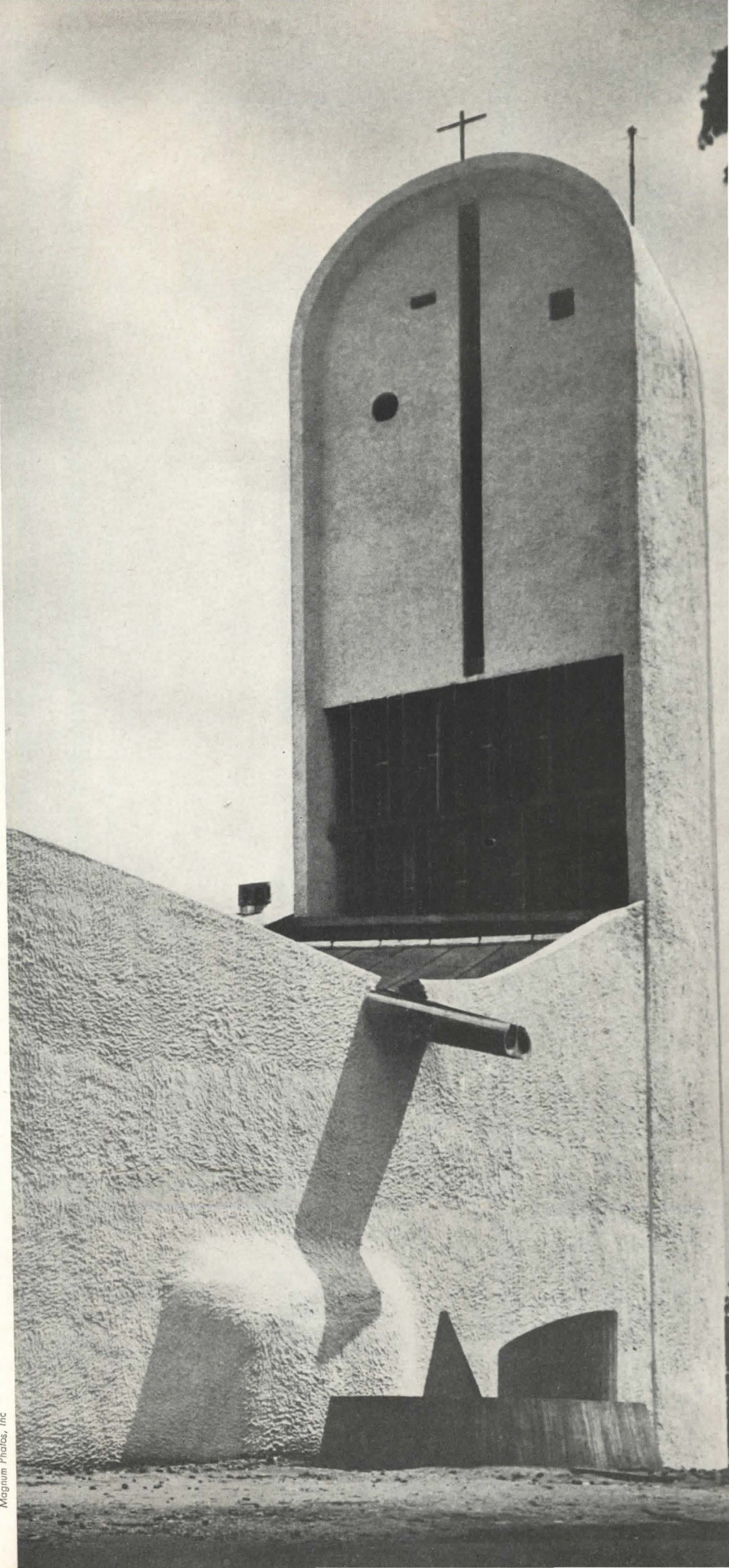
These three projects are enough to illustrate that Le Corbusier, since about 1948, has embarked upon a radically new architectural style, one contradicting those dogmas with which his name has been indelibly associated, an architecture that is highly personal, lyrical, boldly sculptured and colored. In this architecture art dominates structure. This plastic architecture is conceived in terms of a more generous view of the human personality and of family life. As distinguished from his own overly refined and relatively obscure earlier work (the *Pavilion des Temps Nouveaux*, 1937, is a case in point), and much of modern architecture today which still plods in these footsteps, there is a transparency of artistic intention, a direct communication of architectural purpose, to the participant.

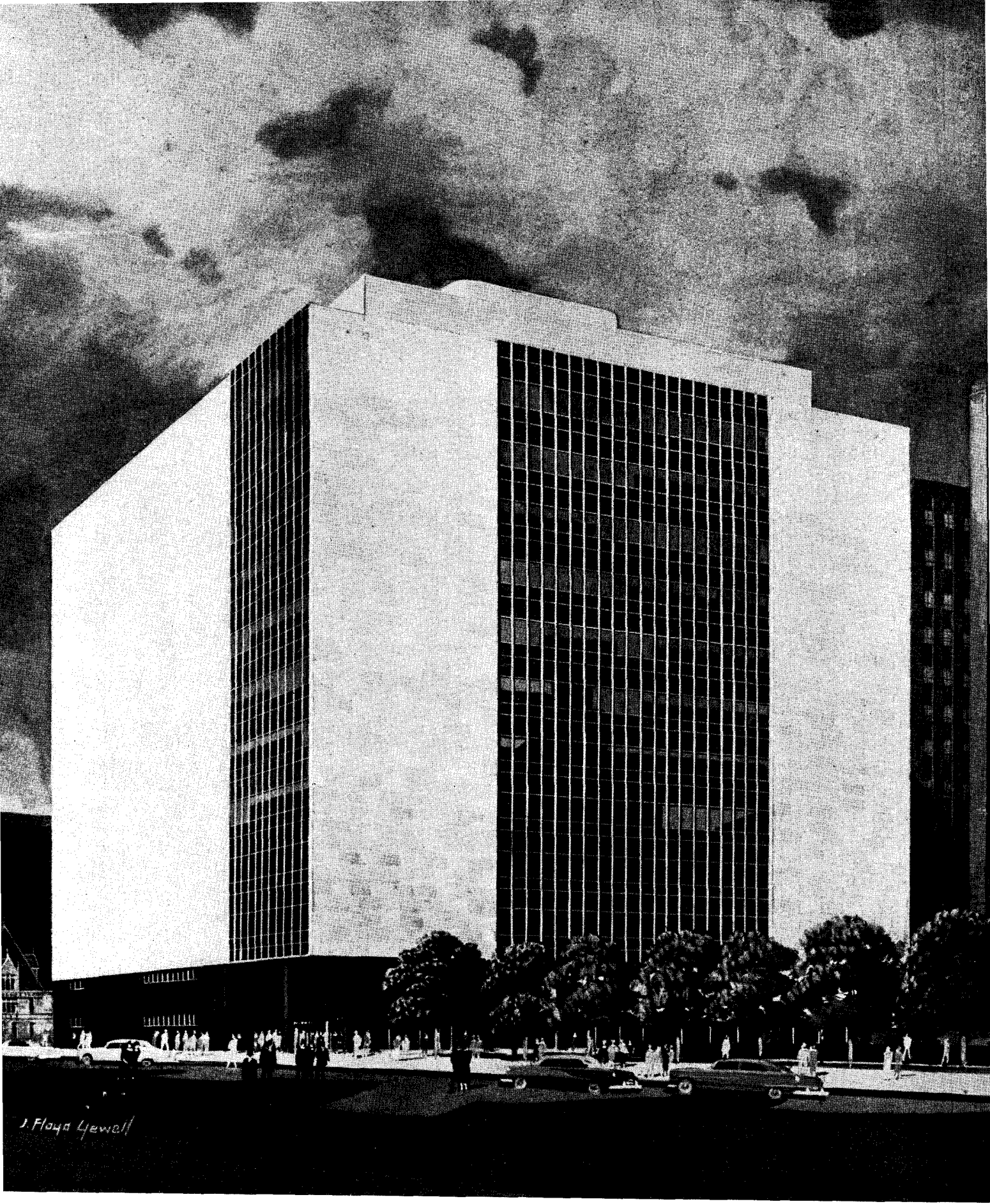
Le Corbusier's new architecture is not an aberration, manifesting itself in a single project. The highly organized artistic quality of the work itself denies that it is a transitional style. Its creative power overwhelms the suspicion of mannerism. That this is a fully self-conscious change will be apparent next year with the publication of *L'Angle Droit*, Le Corbusier's explanation — in verse — of what he is attempting. The efforts that have been made to treat *L'Unité d'Habitation* as an isolated phenomenon — hardly more than an extension of earlier work; to look upon Chandigarh as a genuflection toward peasant building vernacular; or to explain Ronchamp as the architect's sole religious building — these must now give way to an effort to understand the new Le Corbusier.

Why? Not alone, certainly, because as a biographical and stylistic phenomenon it is a fascinating question to anyone concerned with the processes through which great architecture is created; but because, to the debased functionalism and the pragmatic standards of our architecture today, hesitating between the increasingly empty visions of structural expressionism and the conception of architecture as an anonymous vernacular which denies the role of the designer, it presents a major challenge: a renascent individualism.

THE NEW CORBUSIER

Concrete sculpture fully modelled and with great tactile values: facing page left, at Marseilles; center, at Chandigarh. Right, at Ronchamp





J. Floyd Jewell

*Albert J. Bauer, Director, Division of Buildings
Walter J. Detmar, Jr., Director, Division of Building Management
A. J. Daidone, Senior Architect, Building Program
Victor Chiljean, Architect in Charge*

PROPOSED CITY AND MUNICIPAL COURTS BUILDING

City of New York, Department of Public Works
Frederick H. Zurmuhlen, P.E., R.A., Commissioner

William Lescaze & Matthew Del Gaudio, Associated Architects
Weinberger & Weishoff, Structural Engineers
V. L. Falotico & Associates, Mechanical Engineers

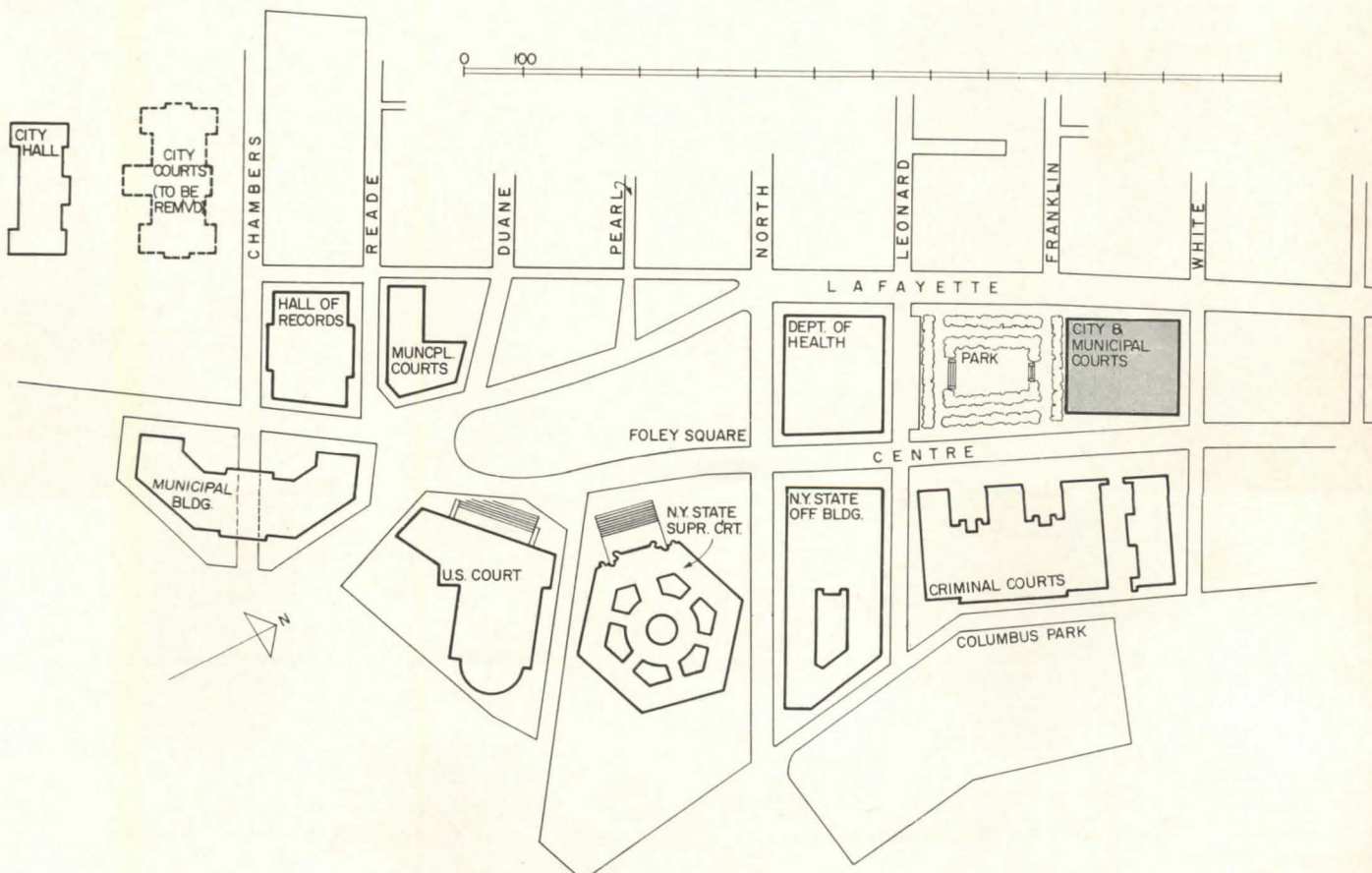
PRELIMINARY PLANS have been filed for Manhattan's new 12-story courthouse near Foley Square, and funds for its construction are proposed for the 1956 city budget. The design is an attractive cube of limestone, glass, and stainless steel, designed and to be built under the supervision of the New York Department of Public Works.

The building will occupy a 34,000 sq ft block formerly the site of the old Criminal Courts building located in Manhattan's civic center area. A park to the south is part of the plan. Franklin Street will be closed as it reaches the site from the west, thus creating an open block of restful green — with peripheral parking — in the civic center.

Among several features of interest in the plan, the

inside courtrooms and differentiated circulations are of particular interest. The concept revolves around the inside courtroom; advantageous esthetically and in dealing with sunlight, outside noise, air conditioning load, etc. The scheme was conceived with the cooperation and advice of Public Works Commissioner Frederick H. Zurmuhlen, P.E., R.A., and officials of the two New York court systems involved — city and municipal. The smaller courtroom, adapted to the actual number of persons using it, is a marked departure from the traditionally larger space, and a forward step reflecting the enlightened viewpoint of the city administration. Officials have followed the development of the scheme with interest.

Public foot traffic within the building is completely

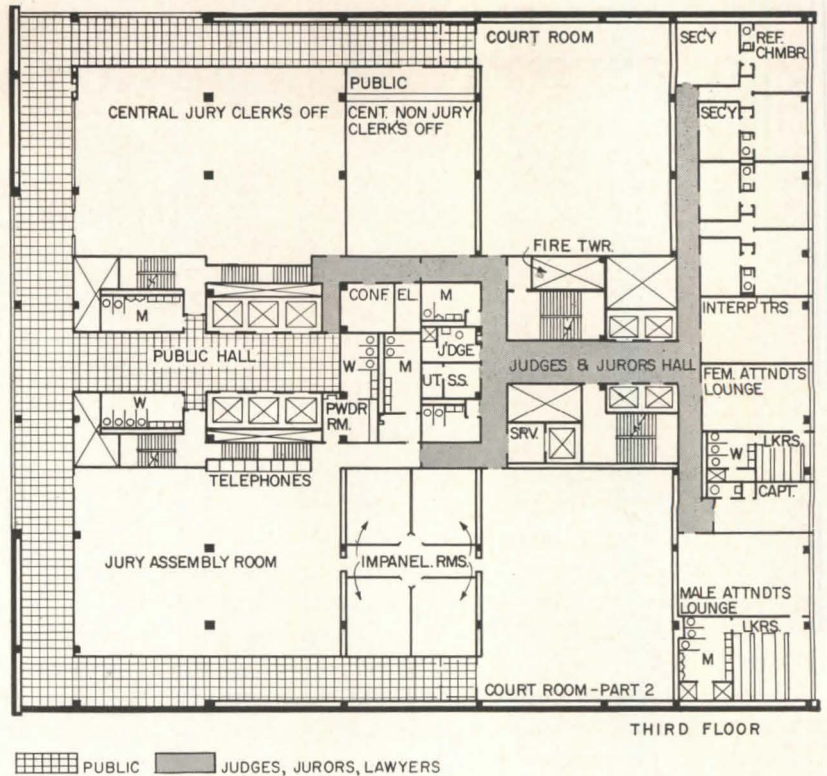


NEW YORK COURTS BUILDING

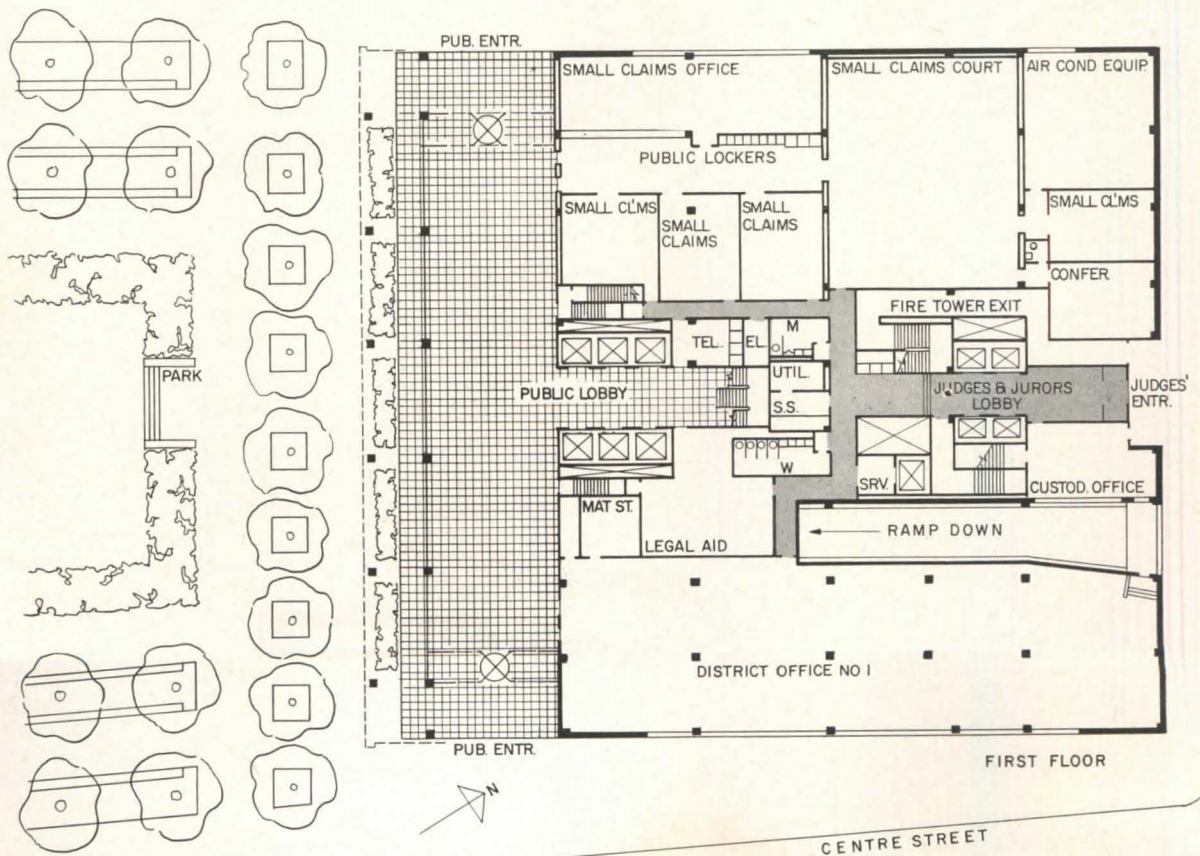
separated from that of judges and jurors — note its indication in the plans — and separate entrances are provided for the two groups.

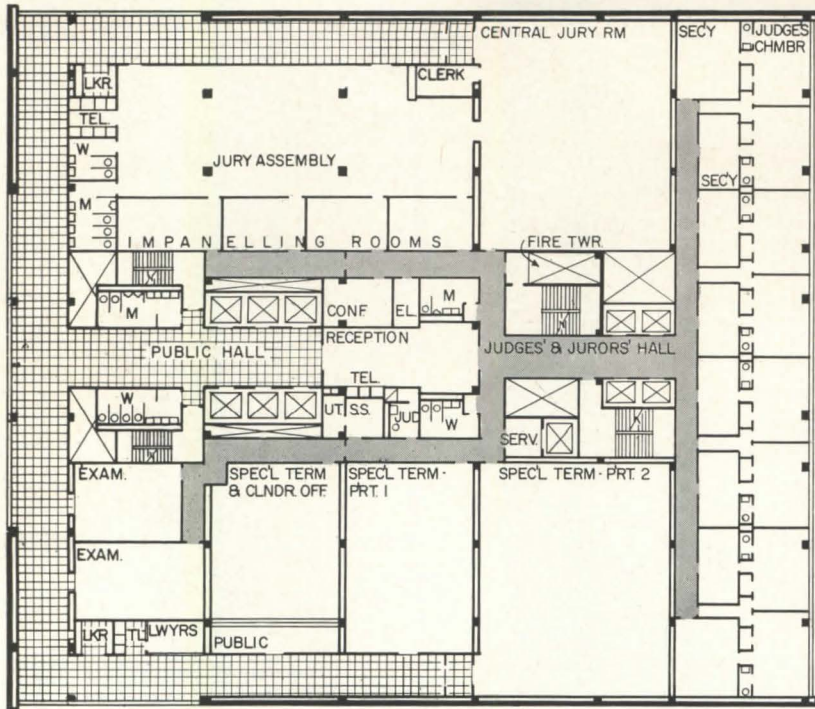
New York's ten municipal district courts are at present located in old, decrepit structures in various parts of the city. This building would bring together for the first time all of the municipal courts and the city court system. Such a consolidation will offer advantages in operation and economies through the sharing of such common facilities as law library, switchboard, first aid, building services, etc.

The floor and roof slabs will be reinforced concrete, supported by a structural steel skeleton. The typical exterior facing will be limestone,



LAFAYETTE STREET

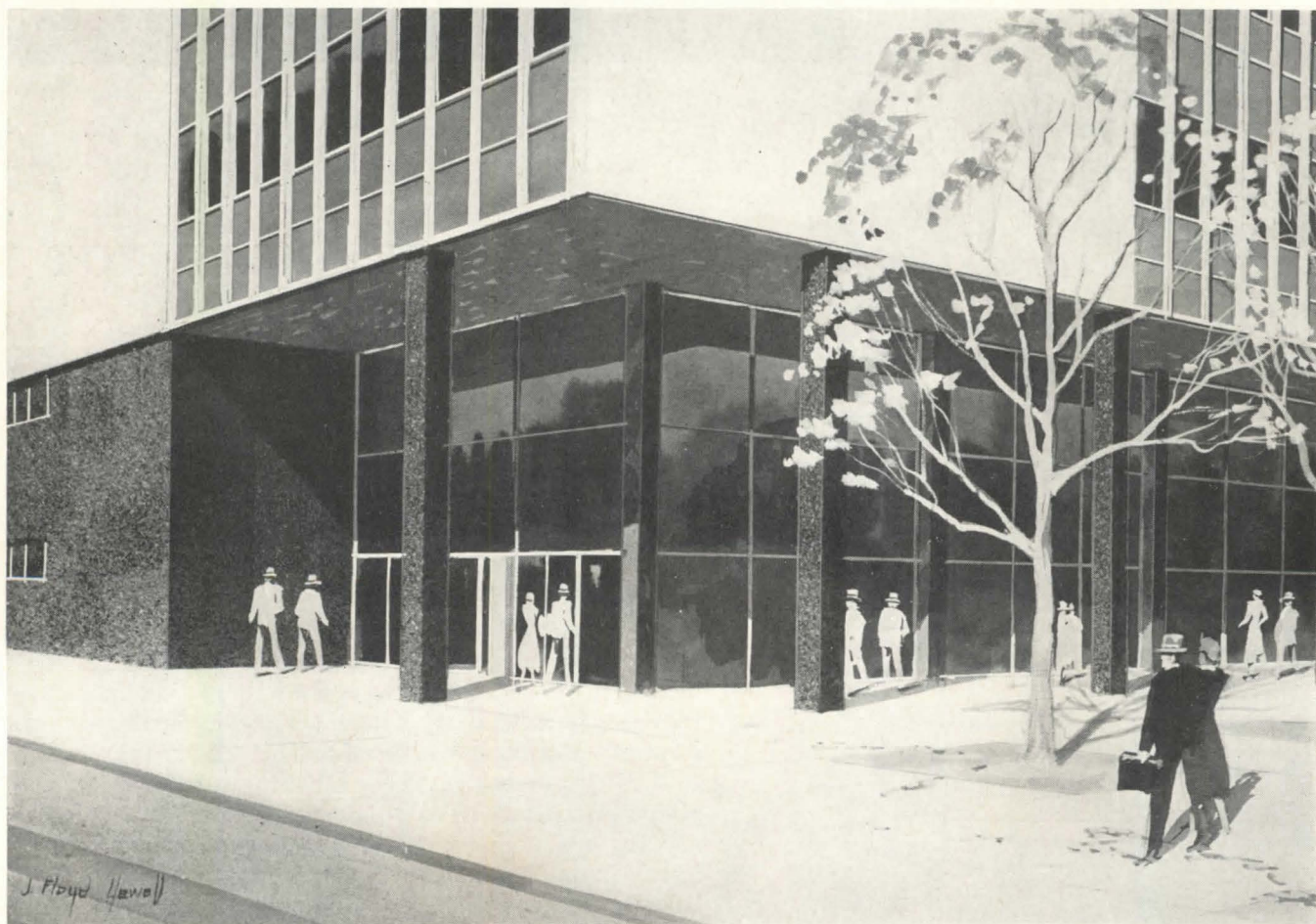




ELEVENTH FLOOR

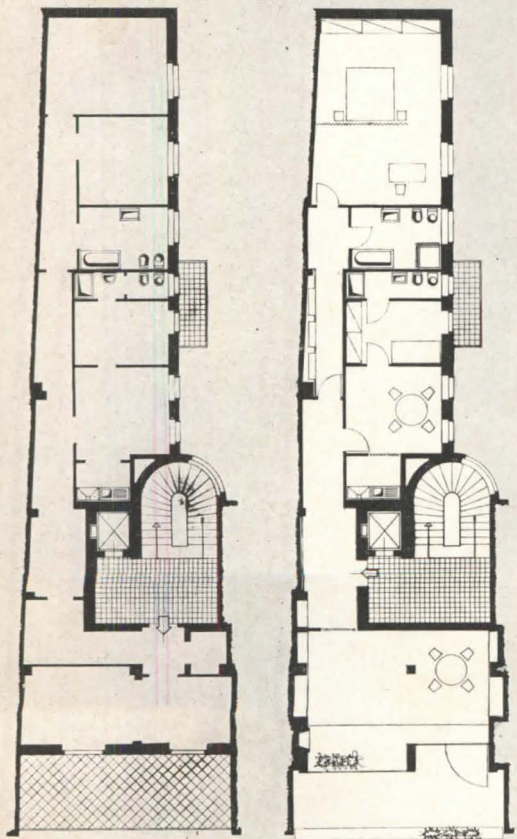
with a dark granite base at ground level, white brick for the penthouse and bulkheads, aluminum cladding for the cooling tower and tank house. The pivoted stainless steel or aluminum windows will alternate with dark granite spandrels to make up the fenestral areas.

The lobby will be finished in dark marble or granite, and open south through large glass areas to the park. Typical corridors will have marble walls and rubber tile floors; courtrooms, assembly room, and library will be panelled in various woods with floors of rubber or cork tile and will have acoustic ceilings; judges' chambers will be carpeted and have wood panelled and painted plaster walls.



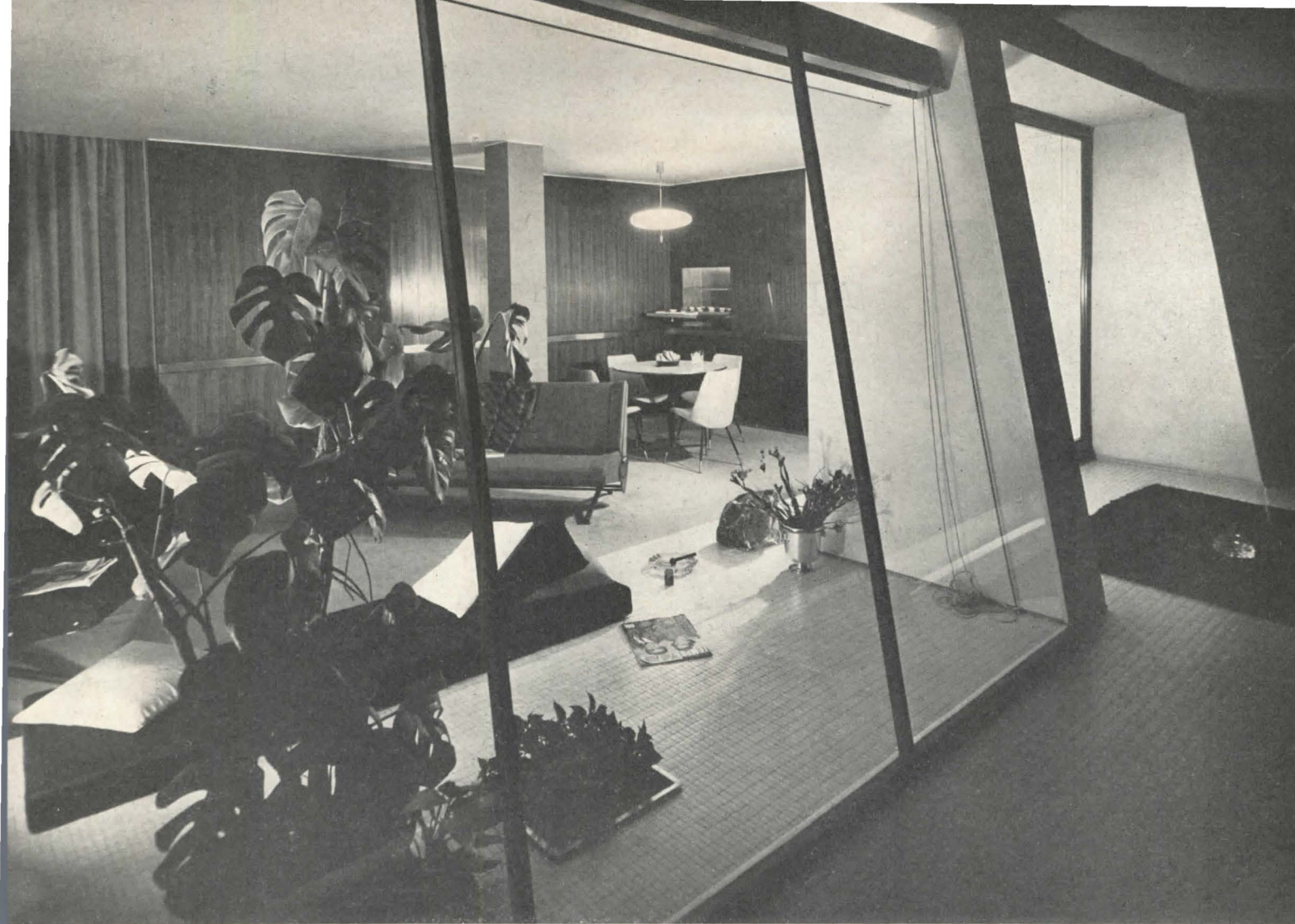
Apartment for Giulio Minoletti
Milan, Italy

Giulio Minoletti
Architect

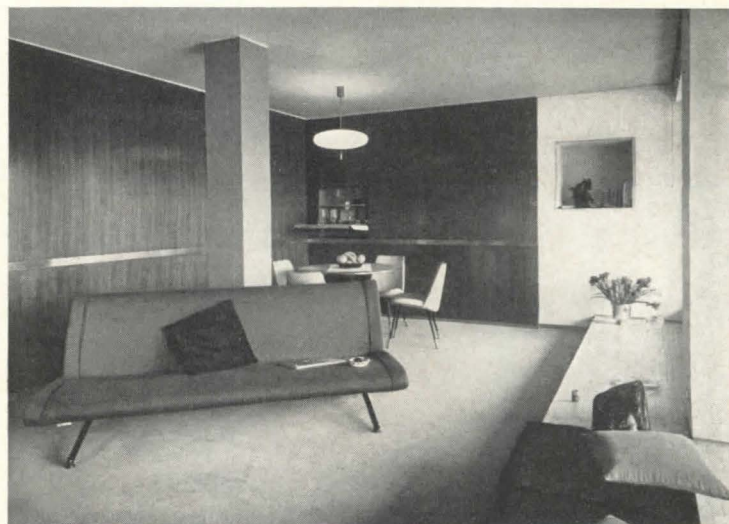
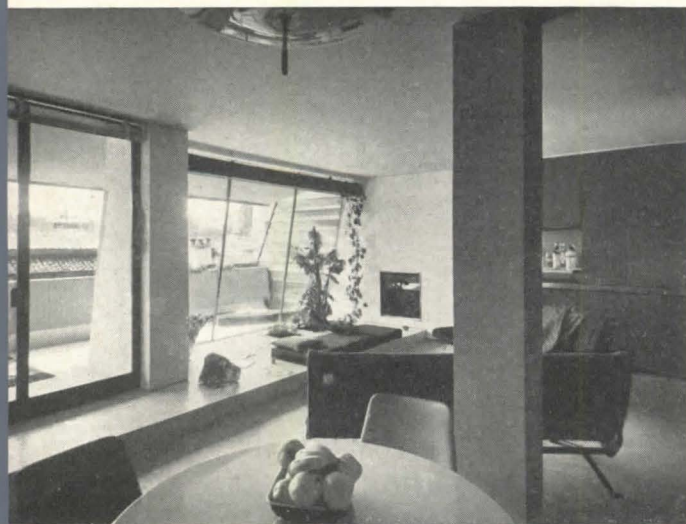


THE CHANGES NEED NOT BE

THE APARTMENT which Giulio Minoletti undertook to remodel for his own use is on the top floor of a very old building in Milan. In its favor was an existing balcony with a view toward the famed Milan Cathedral (just visible at extreme left in photo above); decidedly against it was the "railroad flat" arrangement of rooms. As the plans at left show, the architect held partitioning changes to a minimum; his only major alterations, in fact, were at the front of the house where he enlarged the living area both visually and actually by his treatment of the terrace. Whimsical touches lend character to the living area: a waterfall is built into the terrace railing (Mr. Minoletti likes the sound of running water and the tenants below haven't as yet complained of leaks) and a large chunk of green glass, lighted from below, ornaments the tiled window seat. Colors are forceful — black accented by red and yellow.



VERY GREAT TO MODERNIZE AN OLD APARTMENT



Fortunat

ARCHITECTURE'S PREHISTORIC

By Hans Vetter

Professor Hans Vetter, B.A.; M.A. Academy of Applied Art, Vienna; worked with Josef Hoffmann and Henry Van de Velde; was an active member of the Austrian "Werkbund" and the "Secession"; became professor at the Academy in Vienna in 1933; lectured in London during World War II and was called to Carnegie Institute of Technology in 1947.

IF HISTORY suggests learning or knowing by inquiry, as opposed to legend, then prehistoric architecture involves the learning or knowing of an architecture into which inquiry cannot be made; and this seems to be in the neighborhood of nonsense. A successful venture here depends on the abilities of the inquiring historian, not on the facts to be questioned; and the inquiry results more often in a self-portrait of the inquirer than in a picture of the object. Nevertheless, prehistoric architecture is, and has often been, a favorite subject of archeologists and art historians.

In modern times, Vasari revived the biography of the artists, Alberti the doxography of art. Both were practicing artists. The first layman to write decisively on architecture was Johann Winckelmann. Alberti was an aristocratic creator, Winckelmann a bourgeois observer; the former was in search of a theory of his actual deeds, the latter in search of a leading motive for his observations. Alberti had to convince, Winckelmann could persuade.

This remarkable difference of motivation and of method in both these men remained characteristic for all their followers, and became most obvious one cen-

tury later in Viollet-le-Duc, the artist, and in Jakob Burckhardt, the historian. The attempt to convince, and the attempt to persuade, ended with the victory of the persuader. Alberti and Viollet-le-Duc are nearly forgotten; Vasari, Winckelmann and Burckhardt are still read.

"The history of art today" — according to Venturi — "is directed toward a synthesis of the personalities of the artists and of their reaction to tradition and environment." This statement, whether we accept it or not, is most significant. It shows how much emphasis is laid on biology, history, and behaviorism, and how little on art. For the present study I will adapt Venturi's statement, and shall direct my inquiry, first, toward the personality of the prehistoric architect, then toward his architecture.

Prehistoric personalities are legendary. Although they have proper names, as Adam and Eve, we conceive them more often as class names. We think of Adam and Eve as food-gatherers, who, from depending upon such plant and animal produce as they could collect, were led to discover that roots and shoots and seeds could be made productive under control. How this activity influenced the human mind is well illustrated by the incident with the serpent.

We are told food-gathering was in the beginning the compulsory occupation of the human stock, as it is of the existing apes. Their main concern was: "how to collect, how to feed, how to reproduce?" Collecting became an art; its symbol is the basket.

HERITAGE

HUNTER
HERDER
FARMER
ARTISAN

When their pleasant sojourn at the gardens came to an end, coincident perhaps with man's transition from quadrupedal to bipedal locomotion, human thinking and human acting had to change. What the Biblical poet records of the time from Adam, the post-paradisian, to Noah, the pre-arkian, is about the same as what Hellenic mythographers record of the time from Prometheus to Deukalion; a long list of crime: incest, treachery and murder. We do not know the duration of this period; we can only guess and compare: from Adam to the ark, one thousand millenia or more; from the ark to the airplane, twenty millenia or less.

These thousands of years of pleistocene time and of paleolithic history cover also the history of early architecture, marked by Adam and Noah. As the words pleistocene and paleolithic mean so little, but Adam and Noah mean so much to most of us, I shall call it "Adanoahan" art.

We are told that Adanoahan society was led to develop from food-gathering to food-hunting, and that the collector was superseded by the hunter. Small and big game hunting became fashionable for some hundred thousands of years and provided food for the new heroes, who became dependent on animal behavior.

How, consequently, the early herder originated is open to speculation; most probably by the hunter's intimate observation of wild life, and by the happy incident of finding some deserted brood of a minor animal which attaching itself to the human being could easily be nursed and kept. Who actually began keeping

animals is of little importance for our study, but that early man succeeded in doing so has changed his character from martial to pastoral thinking.

This was not the only transition. Sooner or later food gathering was improved by controlling the growth of useful plants, and this increased knowledge gradually led into the first stages of cultural gardening and farming. Hunter, herder and farmer seem to be direct descendents of the paradisian food collector.

Whatever the sequence of methods in food production was, Adanoahan society witnessed the transition from instinctive collecting to planned hunting, herding and farming. And these activities not only maintained but also shaped their life and their art.

We may wonder how many passionate impulses propelled their urge to fight, to care, and to harvest, but we can be sure that their inventive skill was developed by the constructive thoughts of their instrumental intellect which also characterizes the artisan of all ages. How much this artisan interfered with these first three types of Adanoahan society is postulated by his early emergence as the fourth type in the formation of human civilization.

Hunter, herder, farmer, artisan, then, are the four artistic personalities who laid the foundation for the art of architecture in contrast to animal building. What their particular contribution was, how much of it still remains, how little modern man has added to it, shall be indicated by the following table briefly comparing their character and their artifacts.

HUNTER

The hunter's life was martial:
watching his game he thought
how to kill?

Killing became an art, its
symbol is the arrow.

Discovering mortification and
cremation he honors the hero.

Sheltering himself the hunter
invented a cover and roofed
the tent.

The roof defines a finite space.
Roofing became his art, he developed:
"tent, hut, house."

Feeding himself the hunter relied
on meat and fat. He needed fire
for roasting his game, hence he
invented the fireplace. *Hearth.*

The hunter builds around the fire.
His home-symbol is the fireplace.

Roof and fireplace are martial.

HERDER

The herder's life was pastoral:
guarding his flock he thought
how to care?

Caring became an art, its
symbol is the crook.

Discovering fecundation and
fermentation he honors the prophet.

Sheltering himself the herder
borrows the tent. Sheltering his
flock he invented a fence and
walled the enclosure.

The wall defines an infinite space.
Walling became his art, he developed:
"enclosure, yard, court."

Feeding himself the herder relied
on milk and cheese. He needed water
for watering his flock, hence he
invented the well. *Fountain.*

The herder builds around the water.
His home-symbol is the well.

Wall and well are pastoral.

FARMER

The farmer's life was cultural;
tilling his soil he thought
how to harvest?

Harvesting became an art, its
symbol is the sickle.

Discovering fertilization and
conservation he honors the priest.

Sheltering himself the farmer
borrows the hut. Sheltering his
seed he invented the furrow and
with it floored the field.

The floor is emphatic.
Flooring became his art, he developed:
"field, orchard, garden."

Feeding himself the farmer relied
on his harvest. To hasten his harvest
he invented the hot bed.

The farmer builds amidst his fields.
His home-symbol is the bed. *Couch.*

Floor and couch are cultural.

ARTISAN

The artisan's life was industrial;
forced to work he thought
how to exploit?

Exploiting became an art, its
symbol is the hammer.

Discovering liquefaction and solidi-
fication he honors the administrator.

Sheltering himself the artisan
borrows any cover. Sheltering his
tools he broke a hole and invented
the opening.

The opening is transitional.
Opening became his art, he developed:
"door, flue, drain."

The artisan cannot feed himself.
He has no food, he must be
supported.

The artisan interferes everywhere.
He has no home-symbol.

The opening is industrial.

A first glance at this table shows our four personalities as psychological rather than as historical types. They have not disappeared. They are still alive in all of us; we still concern ourselves with how to kill, how to care, how to harvest, how to exploit. Feeding and sheltering remain our main occupation, and symbol-making our major delight.

Which of these types a modern artist represents, and, accordingly, what the results of his labors are, depends on his thoughts. They may be martial, pastoral, cultural, or industrial. He unconsciously works with preference for one or two of these idioms, or in exceptional cases, in the happy balance of their tetratopic harmony.

As far as I know, none of our modern artists has ever achieved this harmonious degree of civilization. Contemporary architecture, whether traditional or experimental, almost always appears to be artisanic, sometimes *artisatonic*.

A second glance at our table shows the limitation of all architectural activities to the four basic artistic actions of roofing, walling, flooring, opening and — as far as I know — for the first time their logical coordination with the creative spirit behind them. The table also shows the essence of the Adanoahan artifact as potential, not actual.

Since several Ice Ages separate us from it, no material relic remains, and no scientist's spade will ever

unearth its ashes, we easily can empathize into its space, empathize its shape, sympathize with its form, and compathize its style. The Adanoahan artifact appears, measurable and comparable, in our mind, and obliges us to compete with it. No modern architect can be excused for neglecting his court or his floor in favor of some magnified opening.

Another aspect of the table offers a comparison of our ancestral home-symbols and their use in the Western world. Considering that the human race was unable to create more than three home-symbols, their appearance or disappearance is very significant. Looking at our new houses we often find the pastoral fountain abandoned, the cultural couch replaced by "tools of recreation," and our living rooms submerged by martial fireplaces of barbarian dimensions. And we may ask: have crook and sickle any chance of surviving hammer and arrow?

Being artisans, however, we should not conclude this study without exploiting our table at last. It affords us the opportunity to formulate 64 specific propositions asserting the artifact of architecture. If we accept roofing, walling, flooring, opening, as the essential activities of the architect, we must be able to evaluate his artifact according to the meaning of his actions. The following propositions will assert the existence of, and the emphasis laid on, the four essentials in order of sequence.

ARCHITECTURE'S PREHISTORIC HERITAGE

R(roof) artifacts emphasizing the hunter's roof:	W(all) artifacts emphasizing the herder's wall:	F(floor) artifacts emphasizing the farmer's floor:	O(pening) artifacts emphasizing the artisan's opening:
R	W	F	O
R W . . .	W R . . .	F R . . .	O R . . .
R F . . .	W F . . .	F W . . .	O W . . .
R O . . .	W O . . .	F O . . .	O F . . .
R W F . .	W R F . .	F R W . .	O R W . .
R W O . .	W R O . .	F R O . .	O R F . .
R F W . .	W F R . .	F W R . .	O W R . .
R F O . .	W F O . .	F W O . .	O W F . .
R O W . .	W O R . .	F O R . .	O F R . .
R O F . .	W O F . .	F O W . .	O F W . .
R W F O	W R F O	F R W O	O R W F
R W O F	W R O F	F R O W	O R F W
R F W O	W F R O	F W R O	O W R F
R F O W	W F O R	F W O R	O W F R
R O W F	W O R F	F O R W	O F R W
R O F W	W O F R	F O W R	O F W R

For instance: a simple enclosure consisting only of wall and floor can appear twice: as "WF," if the wall is more emphasized than the floor, and as "FW," if the floor is more emphasized than the wall.

So we read: Howard Johnson's sweet service stations

with the imposing roof, the ornate openings, the shiny wall and the neglected floor is properly annotated by "ROWF," suggesting: why do the meat-producing hunter and the non-producing artisan dominate a place offering ice cream? Or, we know Mr. Philip Johnson has honored the artist in New York; why — "ORF" — does he honor the administrator in New Canaan? And so on.

We should be conscious of the fact that architectural symbols cannot be translated into linguistic symbols. We can only speak "of" a roof, we cannot speak the roof. Moreover, modern languages do no justice to an art older than picture-writing.

With the table and the 64 elementary propositions we have briefly interpreted the personalities of Adanoahan society and their influence on architecture. Their artifacts and ours may appear in a new light. There is, of course, more to say of the martial roof, the pastoral wall, the cultural floor, and the industrial opening, which is not taught in our schools or academies.

The education of the Adanoahan architect has not been studied yet, but we may assume there were no colleges of fine arts and no blueprints. His mind was never staled by photographs and journals, but always styled by visions of eternal. His masters were not visualists, they were visionaries; and his were not the visual arts, but "Art" properly and only. Adanoahan art was, as it is today: invisible, but beholdable and graspable.

HOSPITALS

ART AND ARCHITECTURE IN HOSPITALS

HOSPITAL CONSTRUCTION moves forward at a determined if somewhat ponderous pace. The urge to improve the nation's health facilities is not quite comparable to the frantic race against time that goes on everywhere in the school field, but is in its way just as determined. The plain need for quantity of rooms is not so pressing, except in the mental hospital area; nevertheless population increases will eventually be felt in health facilities. The primary motivation here is improvement — improvement in facilities themselves as well as in availability, in medical programming, in over-all attention to health needs. A prosperous nation, we “just ain't done right” by our people.

In the past decade great progress has been made in improving the standards of hospital plants. The functioning of a hospital is better and more widely understood, and building plans reflect this understanding. The buildings presented in this Study are excellent examples of sound planning of hospitals.

There are those — and this writer is one — who say that we haven't made similar progress, generally speaking, in the architectural expression of a hospital. The charge is that we have expressed the efficiency of a medical production line, or have become preoccupied with the patterns of the plan or the masses of the units, or too concerned with materials or construction techniques. And too little concerned with the purpose of the building, which is the return to health and composure of a varied group of sick and discouraged and frightened patients.

One might defend architects in this respect by pointing out that they take their lead from their clients, who are generally medically oriented. Hospital clients have given their best thought, and rightly so, to functional problems of hospital design. A hospital must work, must work effectively and efficiently and economically, and these considerations come first. And the harassed

staffs of hospitals are entitled to have their work made as easy as possible. Medical practitioners, like architectural practitioners, have given lip service to the whole-man concept, but neither group has distinguished itself in the realization of it. Both professions are pressed to keep abreast of their separate technologies, and both naturally find inspiration in that effort. But neither profession is privileged to stop with its own preoccupations, neither can it demand that patients respond to intellectual or professional stimuli, certainly not when they are sick or scared. As patients, people are bound to demand technical competence as a matter of course, but to react to hospital environment like frightened children. However impatient either doctor or architect may become with this reaction, neither can wash it away by wishing.

As a matter of fact, medical thinking is facing up to it, as was very evident at the recent convention of the American Hospital Association. Several addresses dealt with aspects of the whole-man concept. The needs of the patient, indeed, are working important changes in the concepts of medical care, and of the buildings devoted to medical purposes.

One doctor at the Atlantic City meeting (no doubt at the moment emboldened by a cocktail-party environment) even suggested that the word “hospital” was wrong, or at least obsolescent. “We should be thinking of a health center, not a hospital, devoted not merely to curing a patient and getting him out of there, but to keeping him well in the first place.” He had quite a bit to say on preventive education, early diagnosis, patient reorientation and rehabilitation, as well as normal hospital therapy. His peroration was a heartfelt little speech on the Art of medicine, as distinguished from the practice.

It wouldn't have hurt architects to hear it.

— Emerson Goble

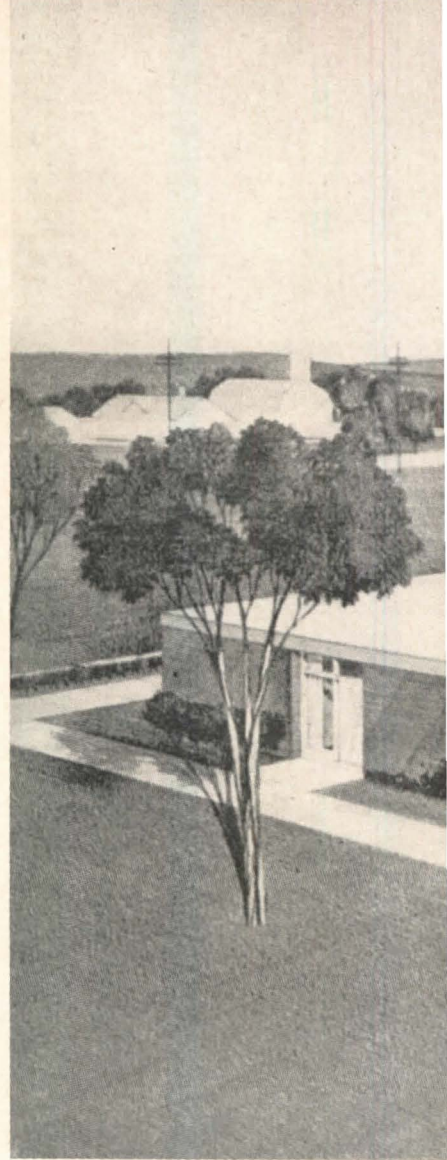
SMALL HOSPITAL WELL PLANNED

IT TAKES pretty tight planning for the minimal hospital, both because the budget is always minimal also, and because the several elements which should be separated tend to crowd in on each other. It is difficult enough for the little hospital to support all the facilities of a true hospital — surgical, obstetrical, radiology, laboratory, emergency, etc. — and the placing of these elements is doubly hard.

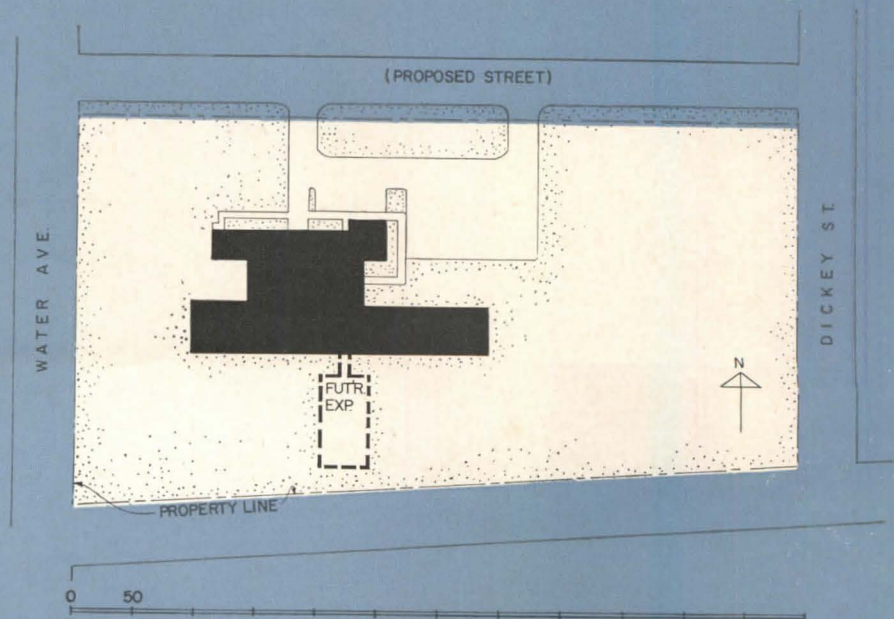
Here a central core containing many of them shields the nursing rooms from the noisier operations in kitchen, laundry and service areas, and houses also the administrative areas. Everything manages to get well located and separated, with the possible exception of the emergency room, which, while properly near the X-ray department, is a rather long haul from an entrance.

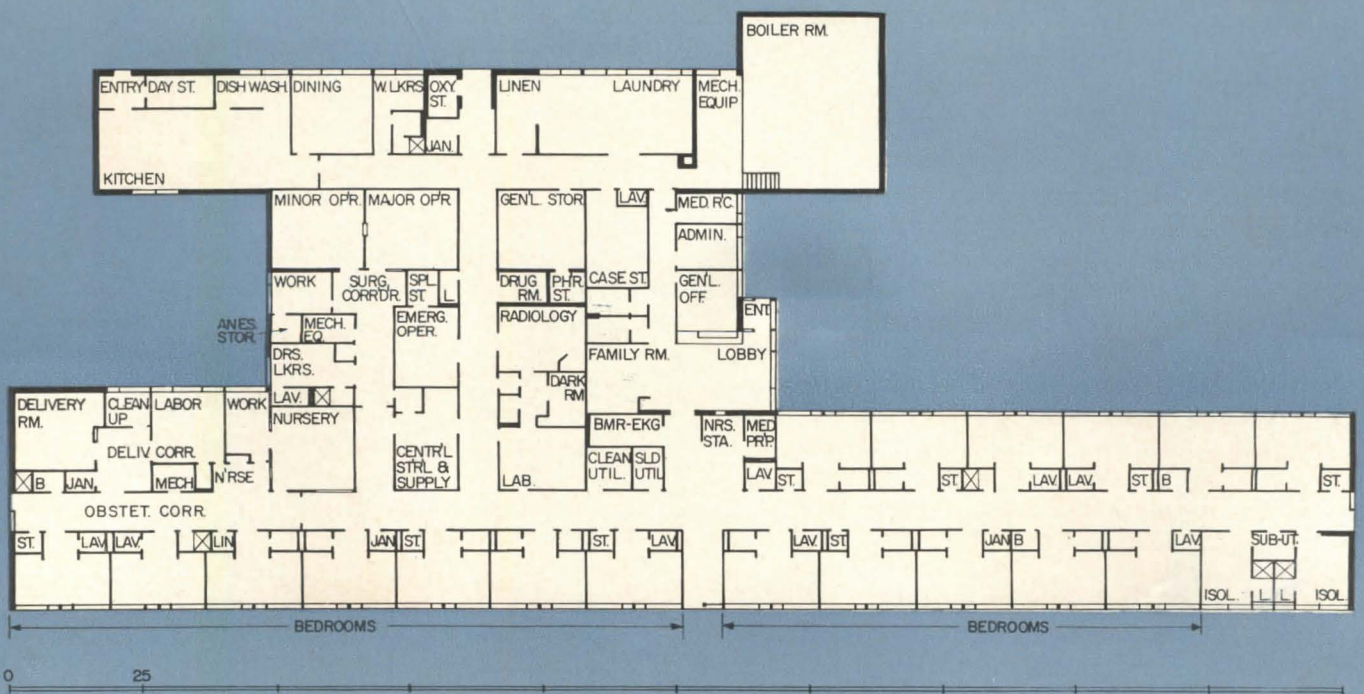
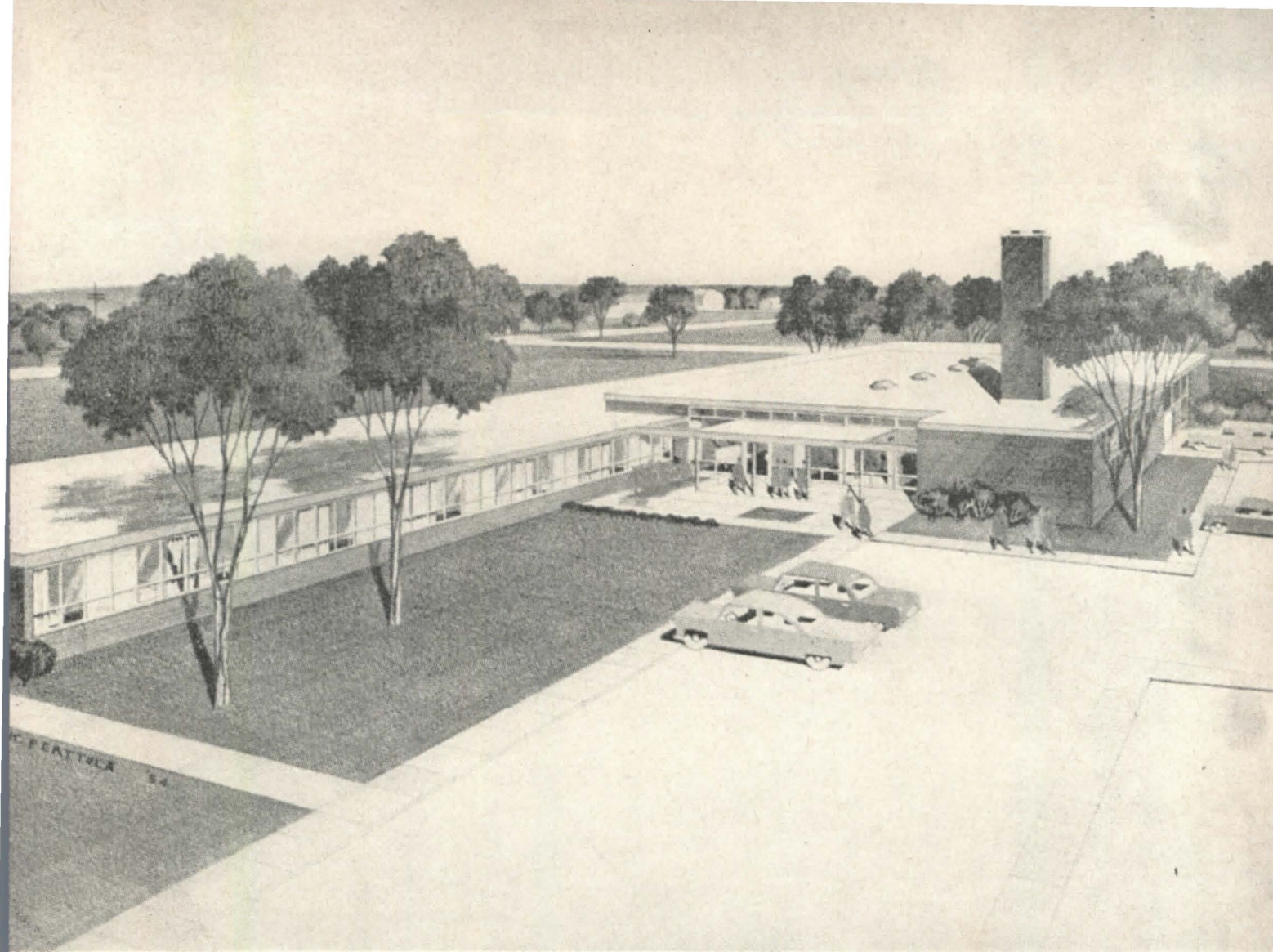
Another principal objective in planning this building was saving nursing and other personnel, and this is well accomplished. The obstetrical suite is placed with this in mind. And the placing of the nurses' station is good — centrally situated with respect to patients and in strategic position for night control of main entrance.

Most patient rooms are oriented to the south, and are proportioned for a foot-to-foot placing of the two beds, so that each patient has an equal chance at privacy, and an equal chance at the sunlight and view.



**APPLE RIVER VALLEY
MEMORIAL HOSPITAL**
Amery, Wisconsin
Thorshov & Cerny, Inc.,
Architects and Engineers







LARGE HOSPITAL WITH IMAGINATIVE PLAN

A LARGE HOSPITAL with a basically L-shaped plan, this building shows careful development of the principles of hospital planning. Each major department has its own cul de sac location where it can go about its own business without any confusion from cross traffic. If the L form of the lower floors is unusual it is, here, quite effective.

The surgical suite has the far end of the first floor with maximum isolation and protection from the rest of the hospital. Of itself the surgical suite is not unconventional, though it does have a larger than usual sterile storage room, complete with autoclave. And the recovery room, now appearing in many hospitals, looks unusual in layout and has the merit of two private rooms for critical cases, with the nurses' work space right between for effective control. It is unusual to have the emergency suite open into the surgical corridor, and the merits of this could be debated both ways. Normally it is considered that the surgical corridor should be protected against possible "dirty" cases in the emergency

room, but a firm closing of the door should be effective. In case of a community disaster with a sudden load of injury cases, the operating suite could become an adjunct of the emergency room.

Also on the first floor, the out-patient department is quite effectively placed for both good control from the main lobby and for isolation of outpatients from the rest of the hospital. Similarly the administration wing enjoys its own isolation.

On the second floor, the L form works out well for the isolation of the delivery suite, and the nursery corridor adjoins the delivery suite but has its own cul de sac location. If the nurses have to walk a long way to take the babies to the mothers' rooms, the nursery is exceptionally well protected against unauthorized entry and the possibility of contamination.

On the upper floors, where the building takes the simple slab form, there is still an extra spur beyond the elevators, where special units can enjoy isolation.

MERCY HOSPITAL

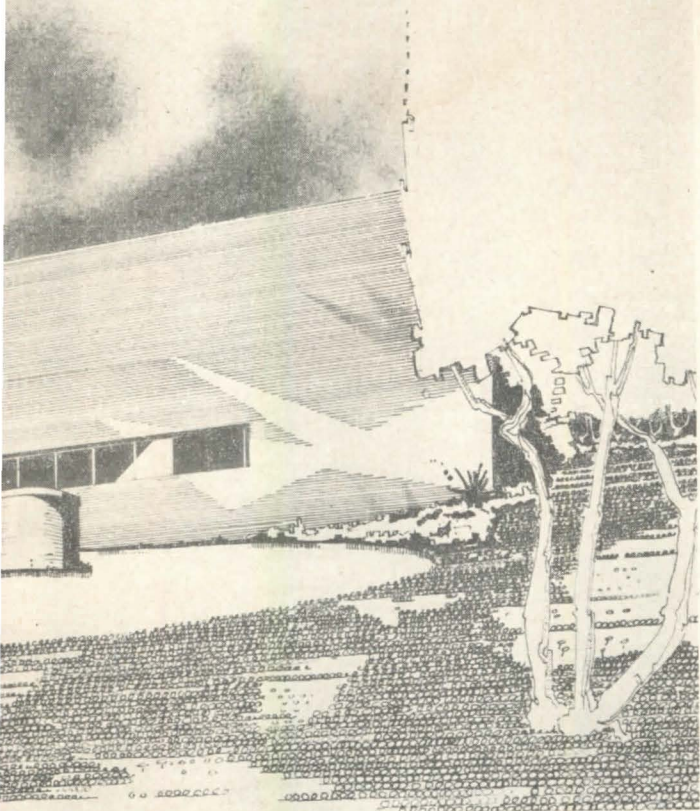
Laredo, Texas

Wade • Gibson • Martin, Architects

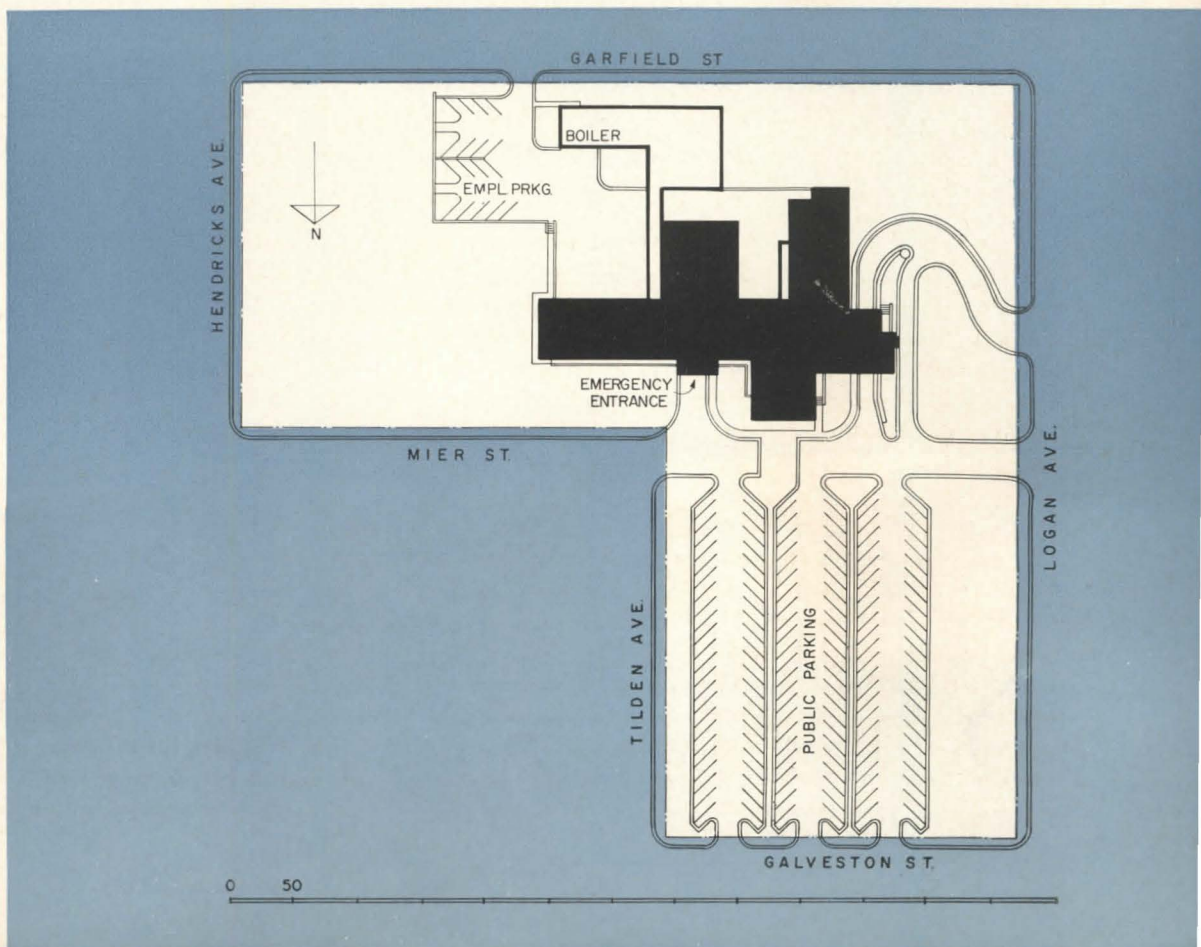
Tom A. Vernor, Electrical Engineer

Martin Staley, Mechanical Engineer

Frank T. Drought, Structural Engineer



Site is a high plot at the edge of town, overlooking the Rio Grande River. The hospital, replacing an outdated one in a downtown location, will serve an area of 150-mile radius, taking some patients from Mexico. H. H. Moeller was recently awarded the general contract, in the amount of \$2,264,000





Phil Fein

CONVENTIONAL PLAN WITH SOLID VIRTUES

THIS LARGE HOSPITAL, 280 beds, is perhaps best characterized as old-fashioned. Old-fashioned in the sense of possessing many conventional virtues which stand out plainly and brook no trifling. There are enough of these virtues so that the hospital has been rated very highly by architects who have studied the plans.

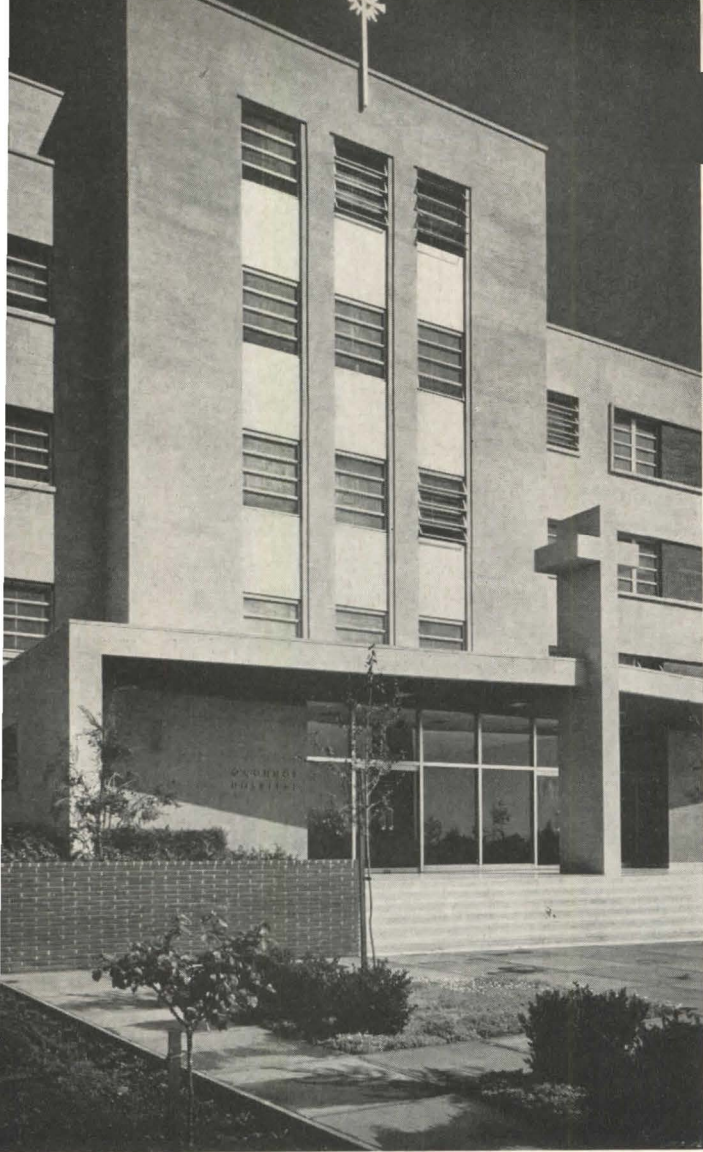
Perhaps it should be said that the clients — in this case largely the Sisters in charge of the hospital — held out for the conventional E plan which makes these virtues natural. Any wing of the E on any floor is available for providing isolation of any department. And that is the way this plan goes: surgical, delivery, central sterile supply, laboratory and X-ray, pediatrics, all have nice, inviolable departments. Generally, then, the nursing units group around the central portions, though they do get out into the wings also.

A possible disadvantage of such positive departmentalization is some lack of flexibility, when the maternity nursing unit, say, is not fully occupied and

medical units are overcrowded, but this is not usually an insurmountable problem. Also full division of departments tends to demand full staffing in each separate area, with little chance for flexibility here; this is not so likely to be a serious consideration in so large a hospital as this, though, which simply must have a complete staff in any case. Probably the Sisters here were just determined that there would be no staffing problems permitted.

A factor here is that this is a teaching hospital, with a large nursing school in connection with it, so that mere recruiting of sufficient numbers of nurses is never likely to be as much of a consideration as good possibilities for teaching.

Still along this line, the E plan has a tendency to send certain of the personnel on long walks between distant departments or even within a group of nursing rooms. Again this is bound to be true because of the size of the hospital. And typical nursing floors are

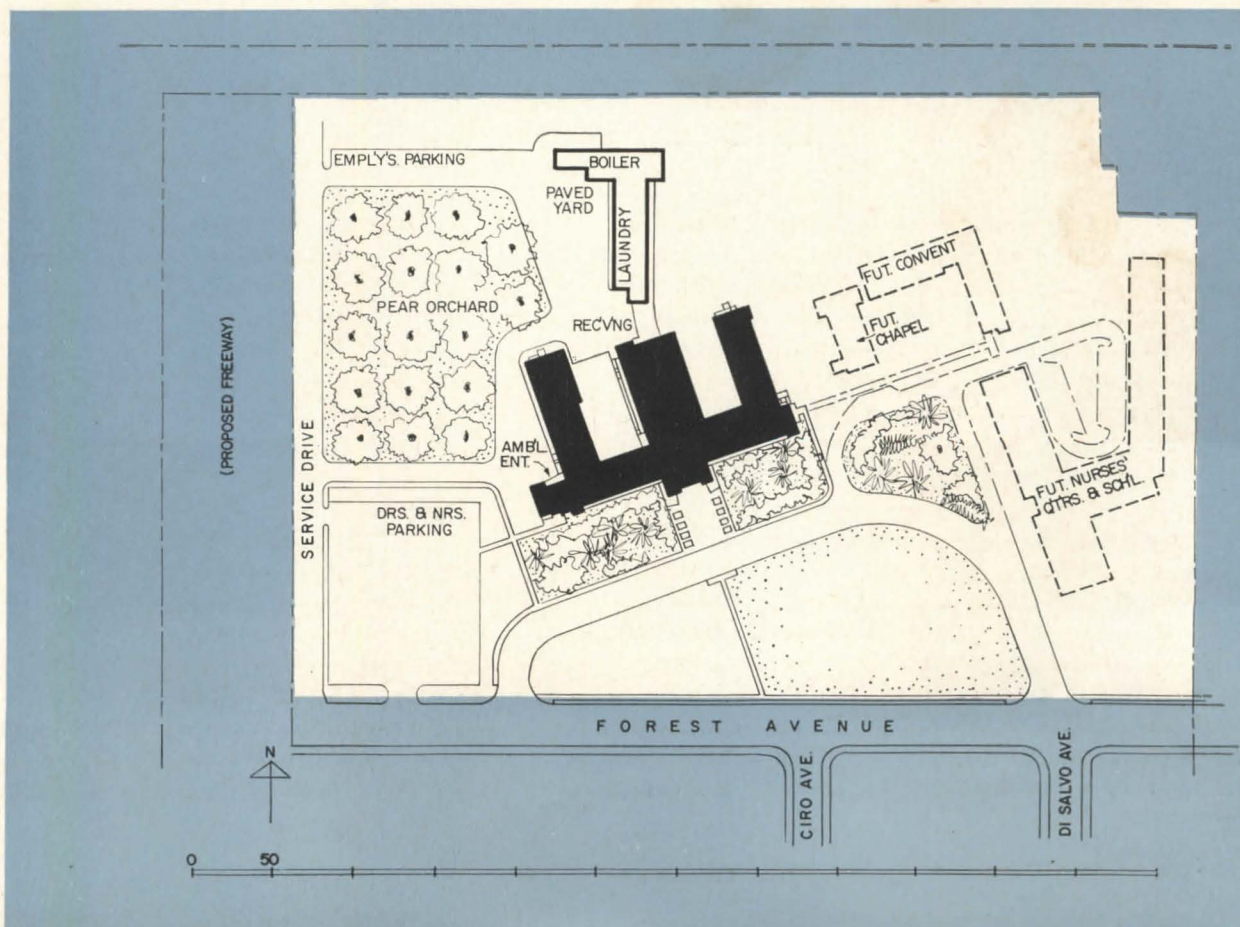


O'CONNOR HOSPITAL
 San Jose, California

*Maguolo and Quick,
 Architects, and
 Frank W. Trabucco,
 Architect associated with
 Frank T. Georgeson*

*Dames and Moore,
 Foundation Engineers
 Ellison and King,
 Structural Engineers
 Coddington Company,
 Mechanical Engineers*

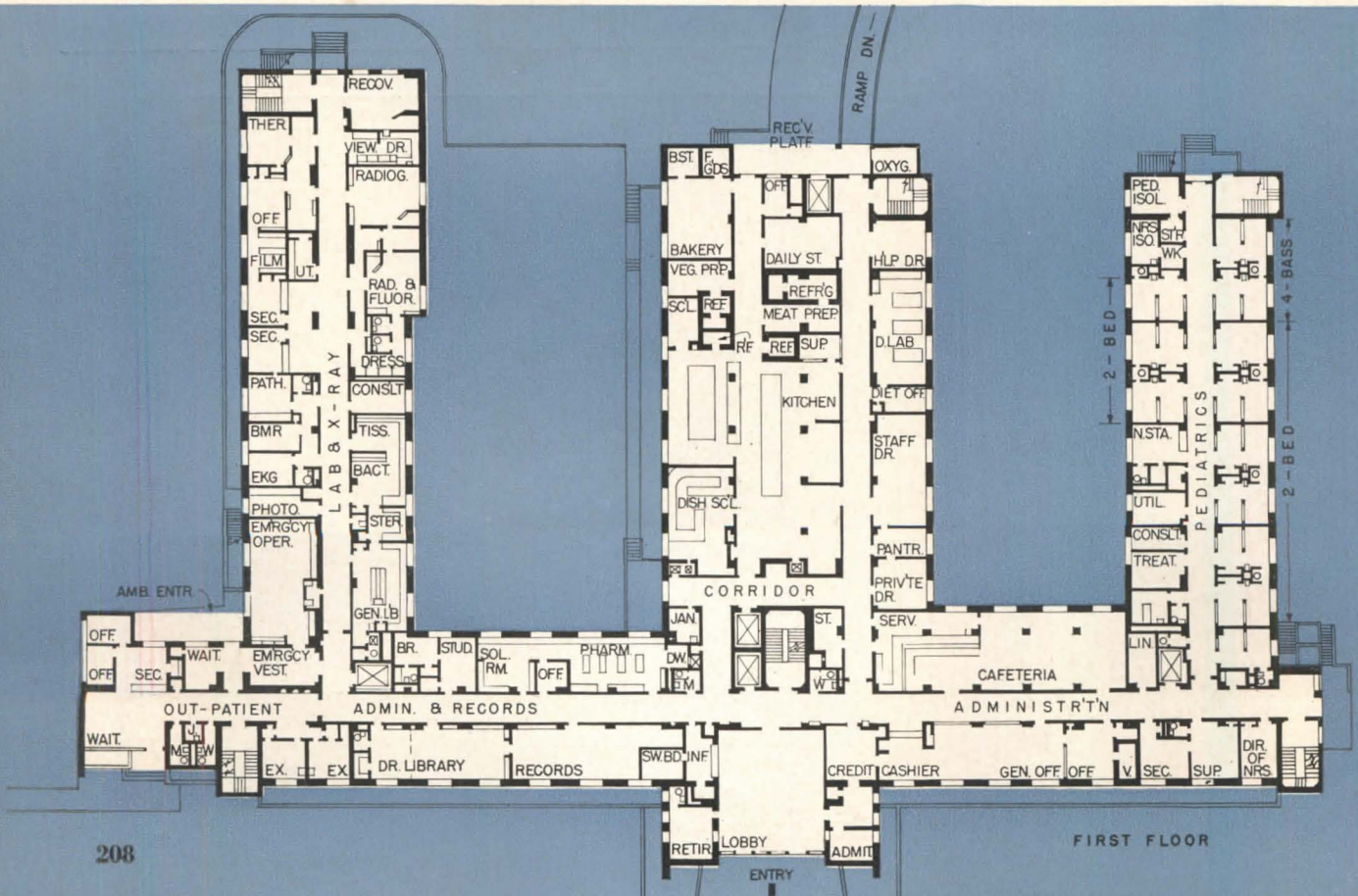
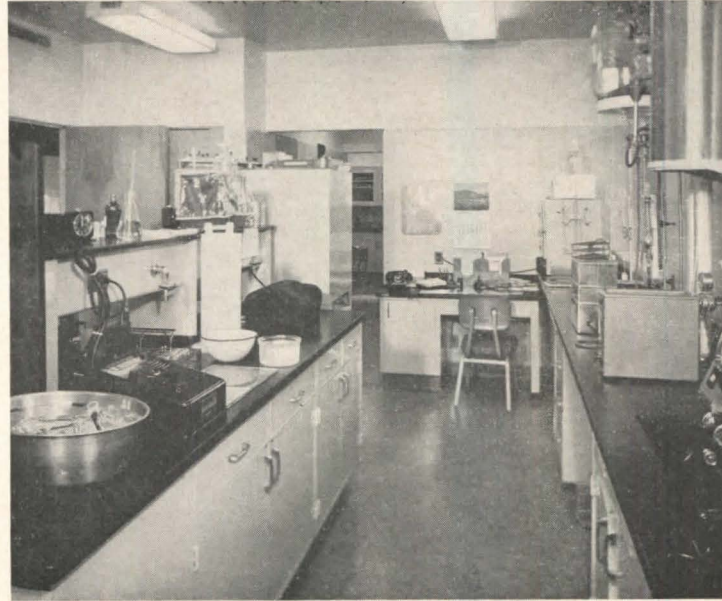
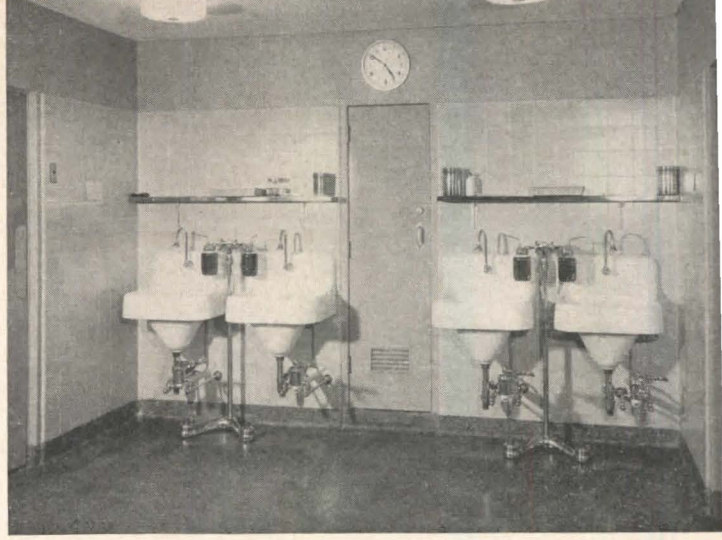
Hospital complex will eventually include a convent and chapel; present buildings include the hospital, boiler house and laundry, and the nurses' school and residence. Site of 15 acres is within the southern limits of San Jose

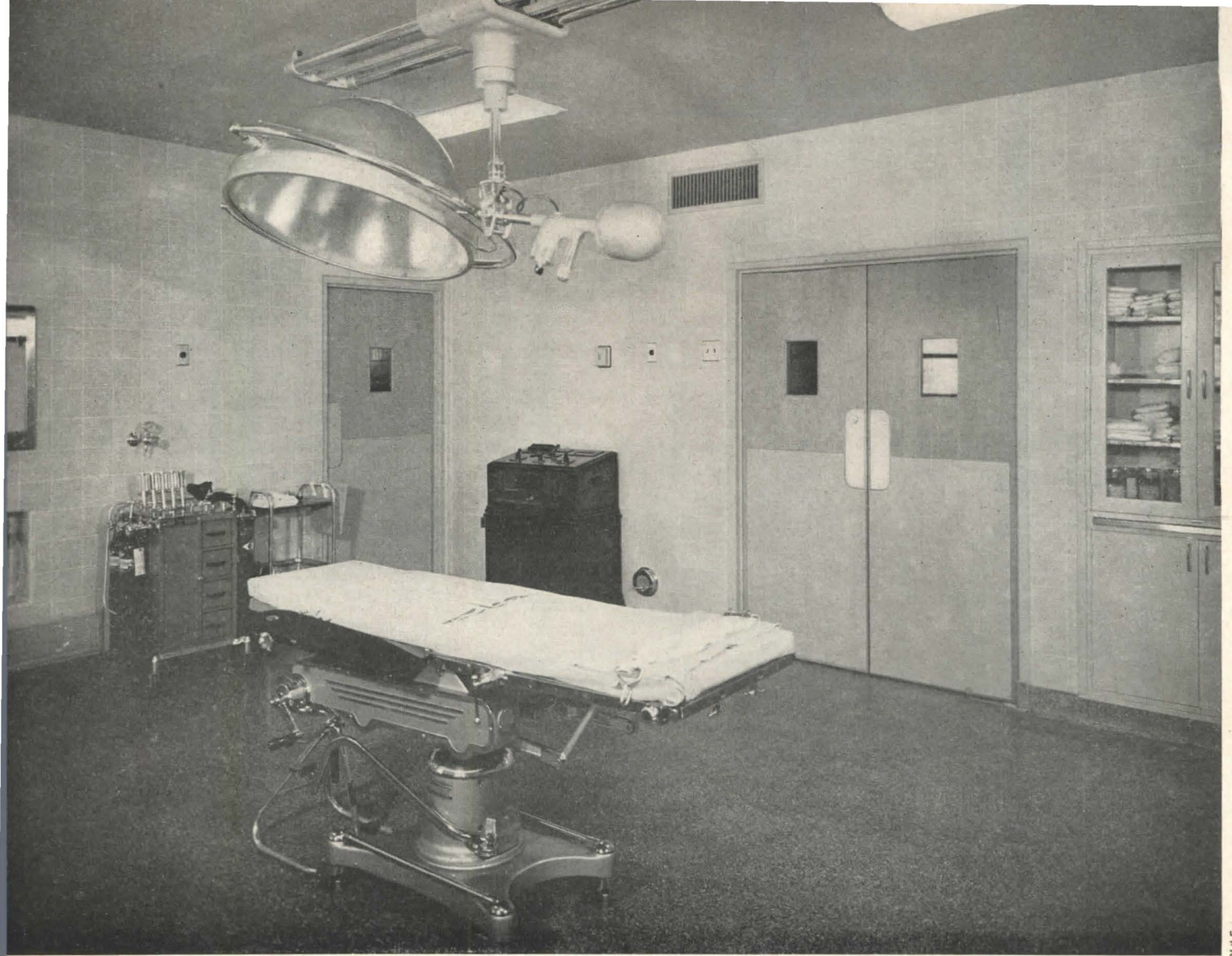


operated during daylight hours from three separate nursing stations; ordinary walking distances, then, are quite normal.

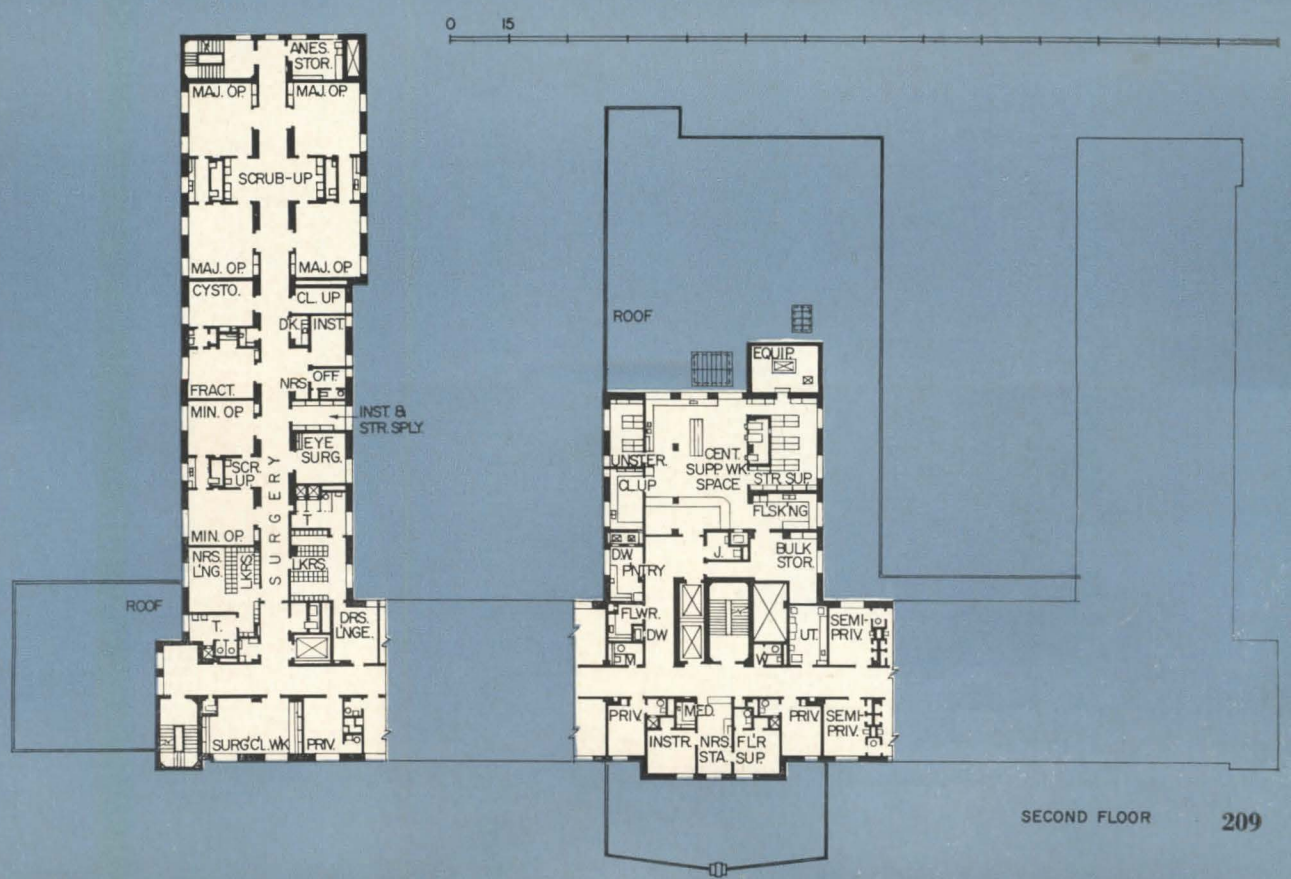
Though this building does have a full basement, this space is not used for kitchen, dining room, and some other items usually relegated there. As a matter of fact, this disdain of basement space has left this basement largely undeveloped to date, but plans call for eventual establishment of occupational therapy and suchlike facilities there.

There is a full basement (plan not shown) containing various store rooms, locker rooms, morgue and so on; it has plenty of space yet to be developed, which will house eventually occupation therapy and similar facilities. Operating rooms (opposite page) and scrub-up alcoves are fairly conventional, well equipped. Laboratory facilities are quite extensive (one section in photograph, right)





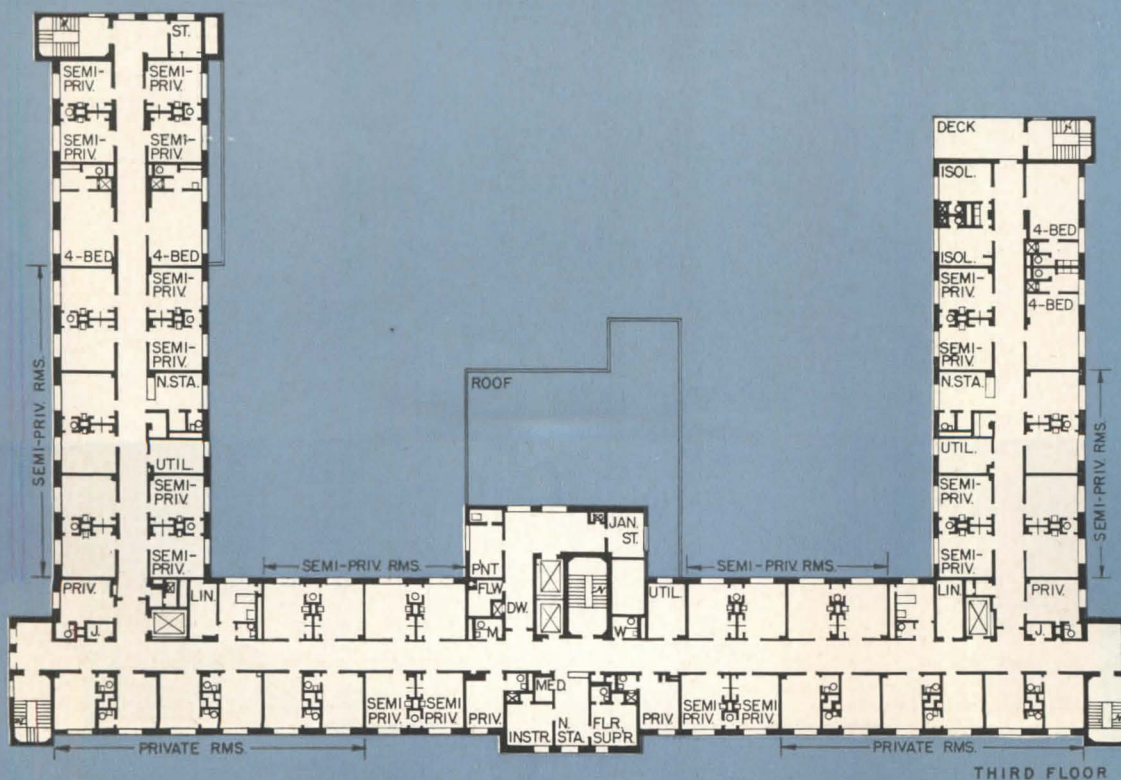
Phil Fern

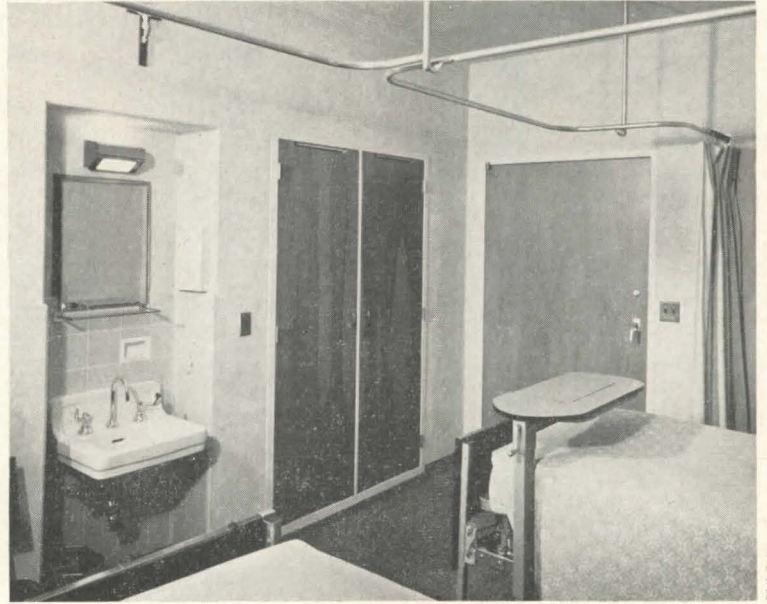
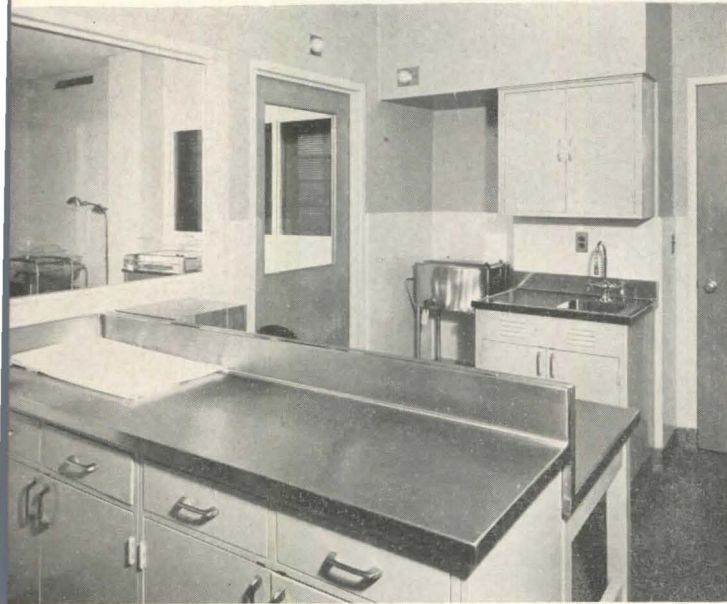
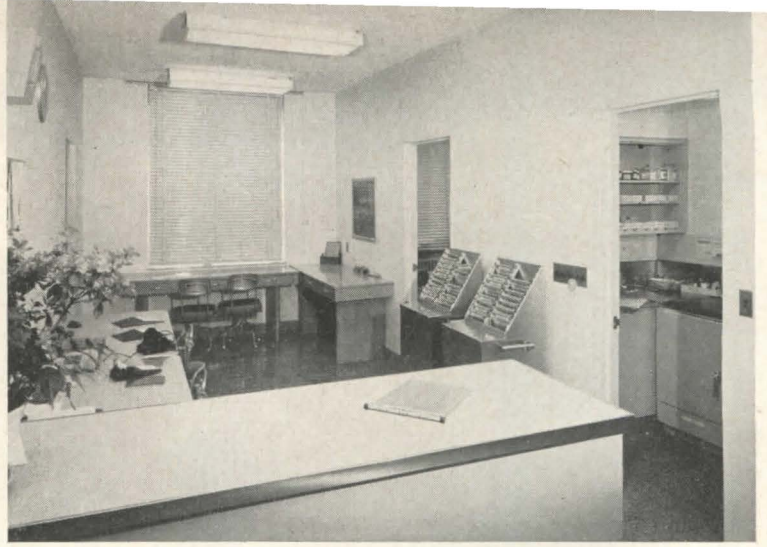
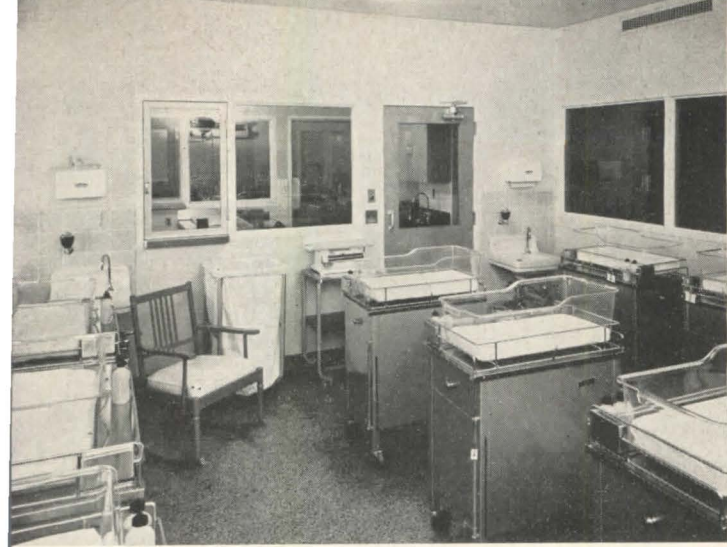


HOSPITALS

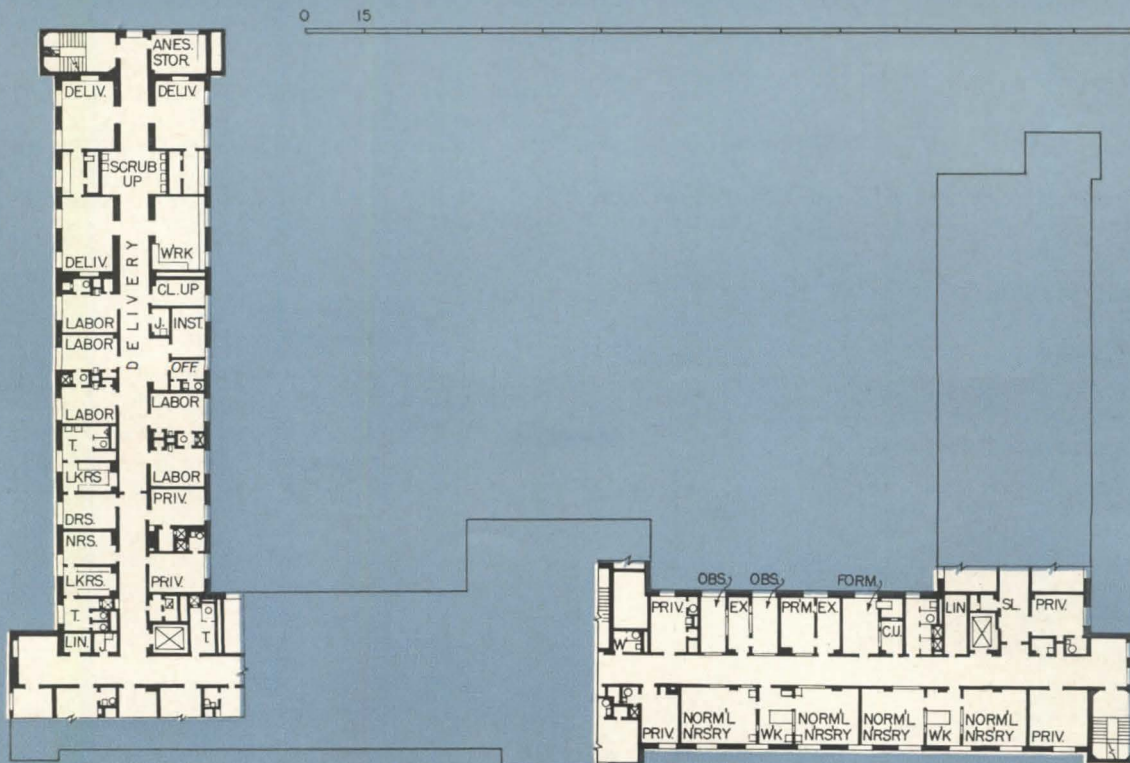


Third floor plan shows typical disposition of bed rooms and wards. Notice that a bedroom floor has three separate nurses' stations for normal daytime operation, with the central one functioning as a control center. Nurses' stations are large, to serve the training program for nurses. photographs show: (this page) kitchen and pharmacy; (opposite page) nursery and, under it, the nursery work room; typical nurses' station and typical semi-private room





Phil Fain





Douglas M. Simmonds

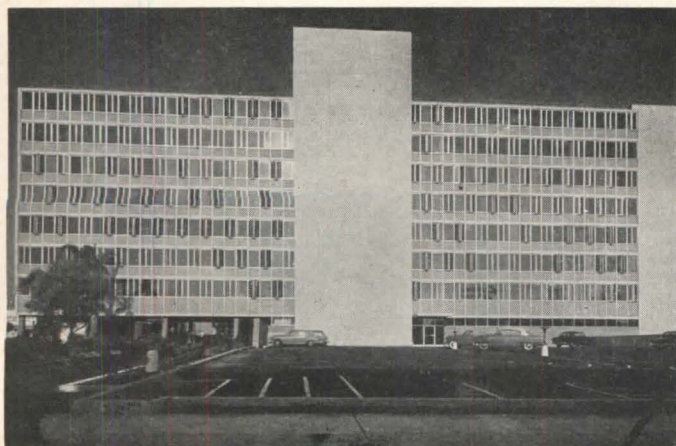
CHRONIC CASES NOT FORGOTTEN HERE

NEW MT. SINAI HOSPITAL, Los Angeles, Cal.

Welton Becket & Associates; Palmer, Krisel & Lindsay; Architects and Engineers

W. J. Mezger, Hospital Consultant; Richard R. Bradshaw, Struct. Engineer; Ralph E. Phillips, Inc., Mech. and Elect. Engineers

Marvin Rand

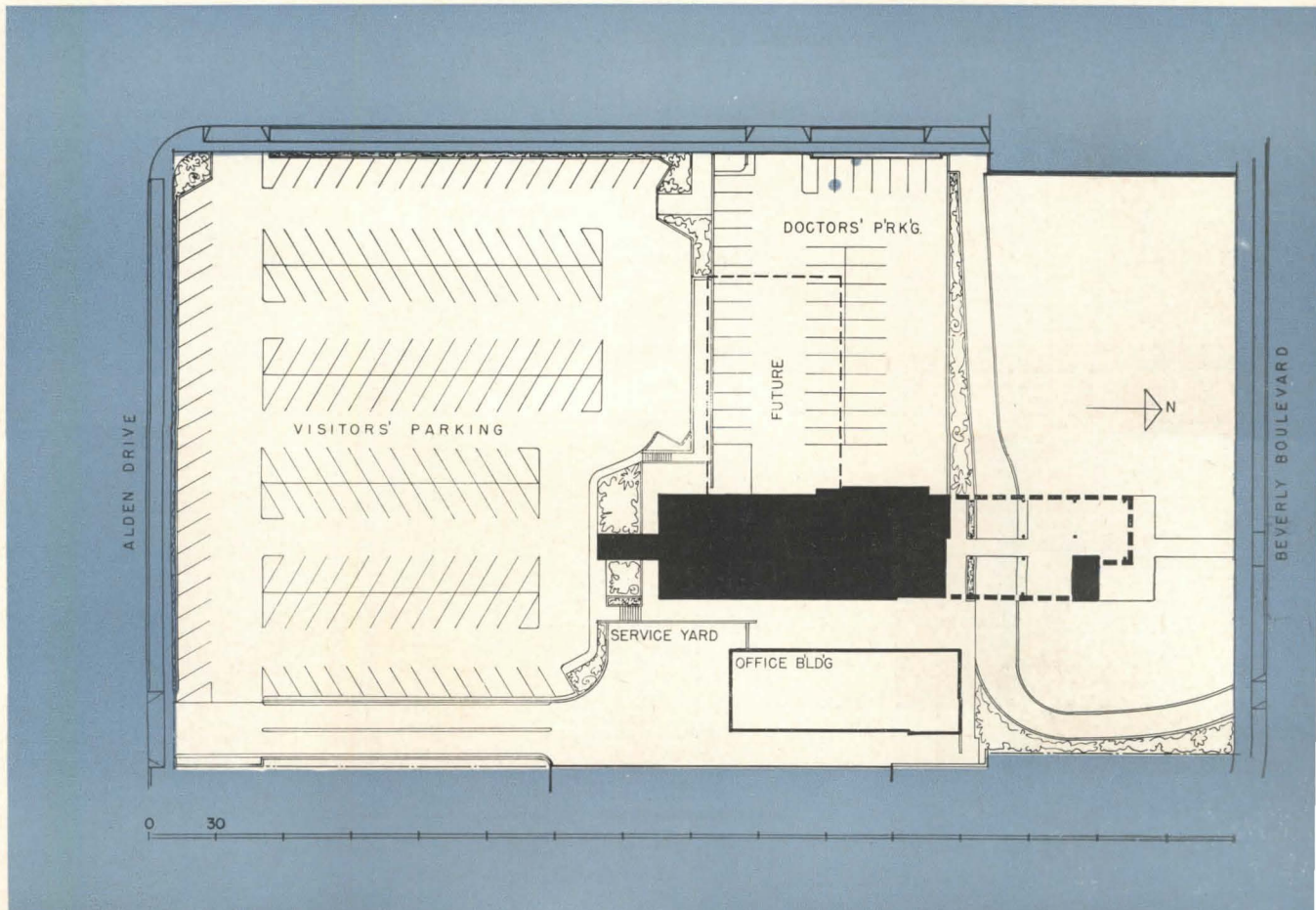


THE CONCERN of Mt. Sinai hospital for its chronically ill patients, also indigent cases, makes this an especially interesting hospital. The older Mt. Sinai Hospital, long established in Los Angeles, has always stressed this part of medical service; in planning its new building it kept this firmly in mind, not forgetting that modern medicine calls for all possible rehabilitative measures for such patients.

This new building, then, has especially comprehensive physical therapy and rehabilitation facilities (its second floor) and will have still more when its master plan is fully realized. The model photo above shows a six-story addition for the chronically ill, and five additional stories on the main portion; as now built, the hospital



Marvin Rand



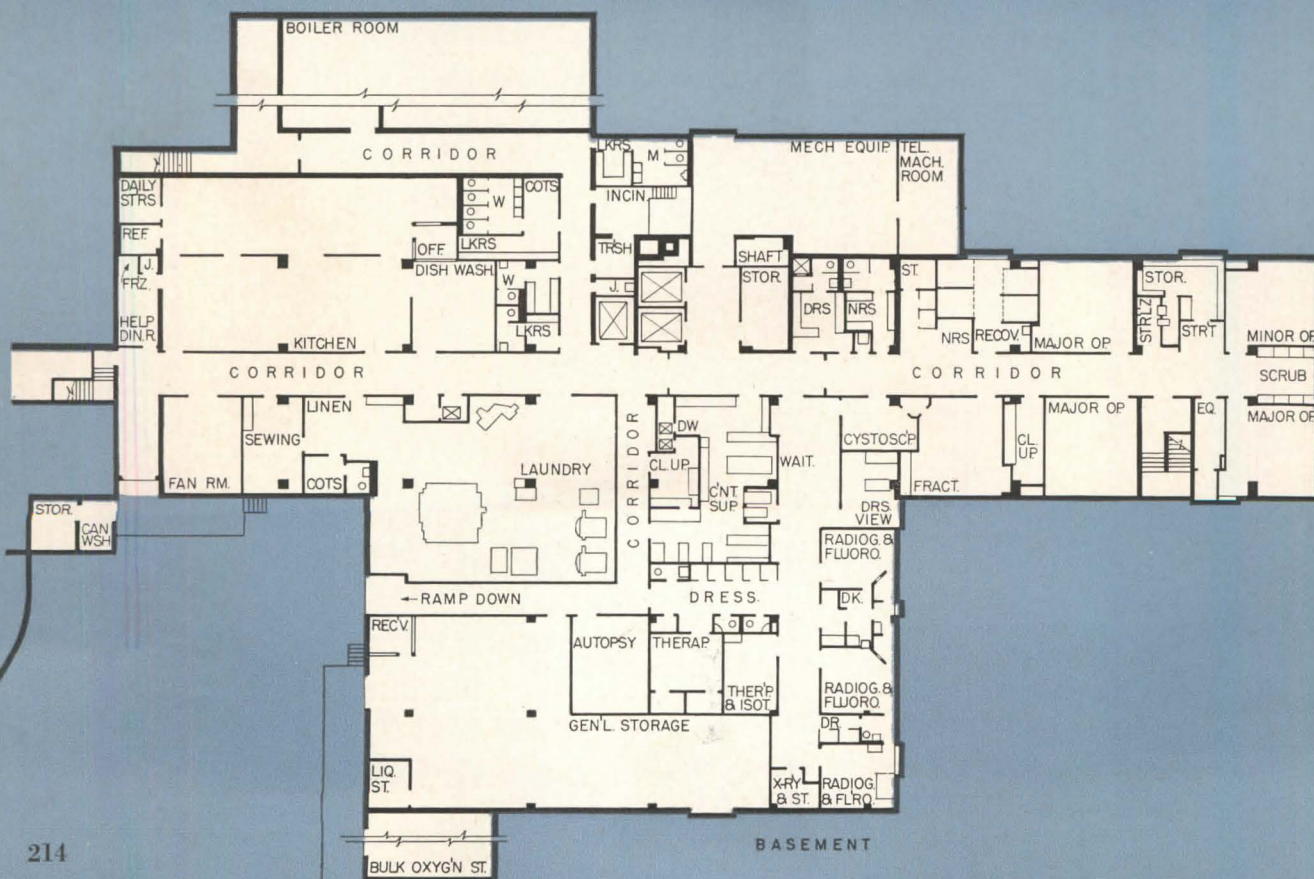
has eight stories in the main building. The existing hospital will continue to be operated largely for custodial cases.

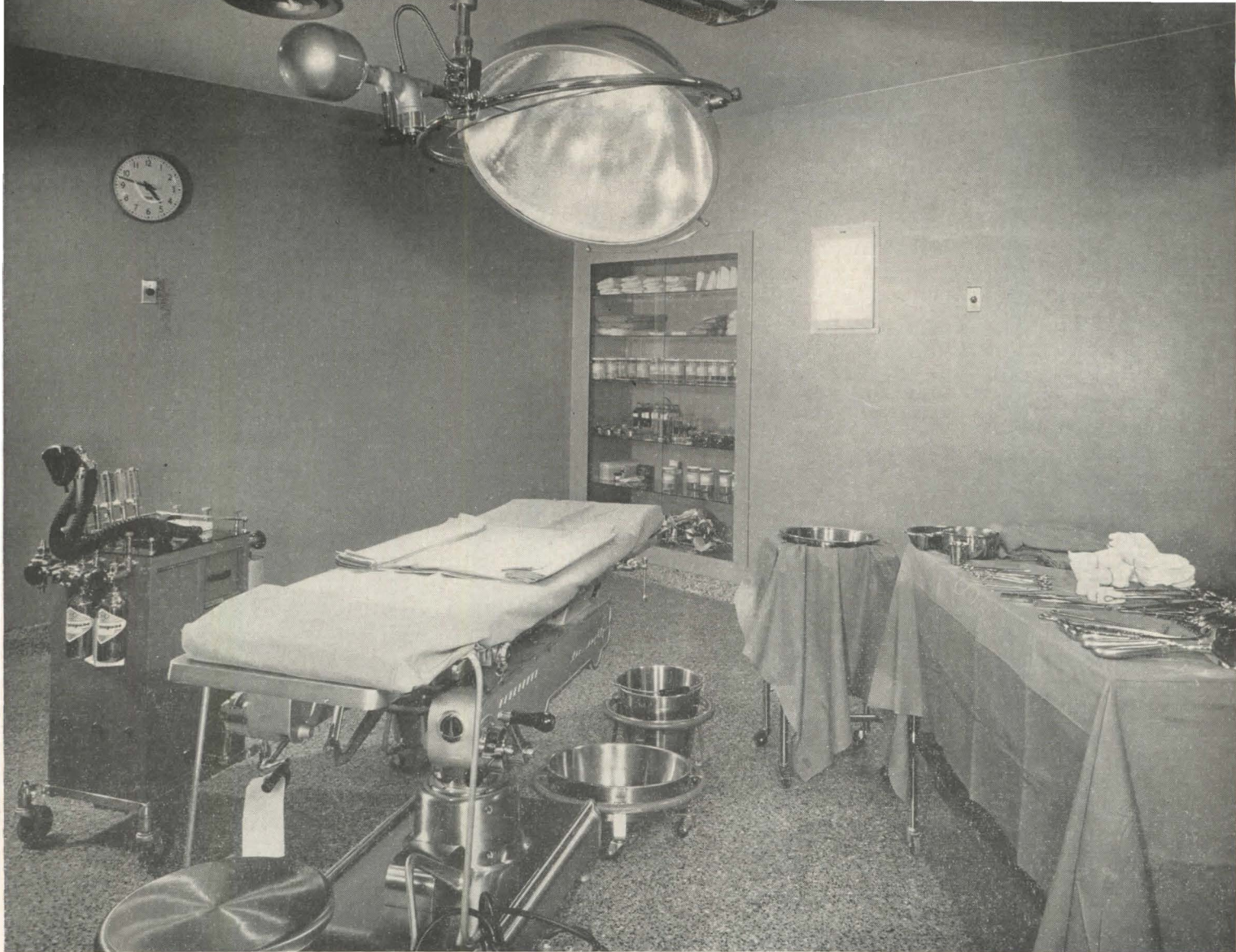
In a sense, then, the present movement to do more for the chronically ill finds support in the program of this hospital. This concern, sharpened by the rapid strides since the war in rehabilitation, has led to a great deal of discussion of the proper place for the chronically ill patient, with a considerable body of sentiment in favor of the general hospital as the place. Whether by intention or not, this Mt. Sinai hospital becomes a case in point. In any case, the Los Angeles area has more than its normal share of persons who are, or soon will be, more or less chronic invalids, and a consequent need for facilities.

The new building has approximately 252 beds, about half of which are considered for indigent patients, half for private patients at full rate. Thus some of the floors have most of the 40 beds in semi-private rooms, others most of them in four-bed wards.

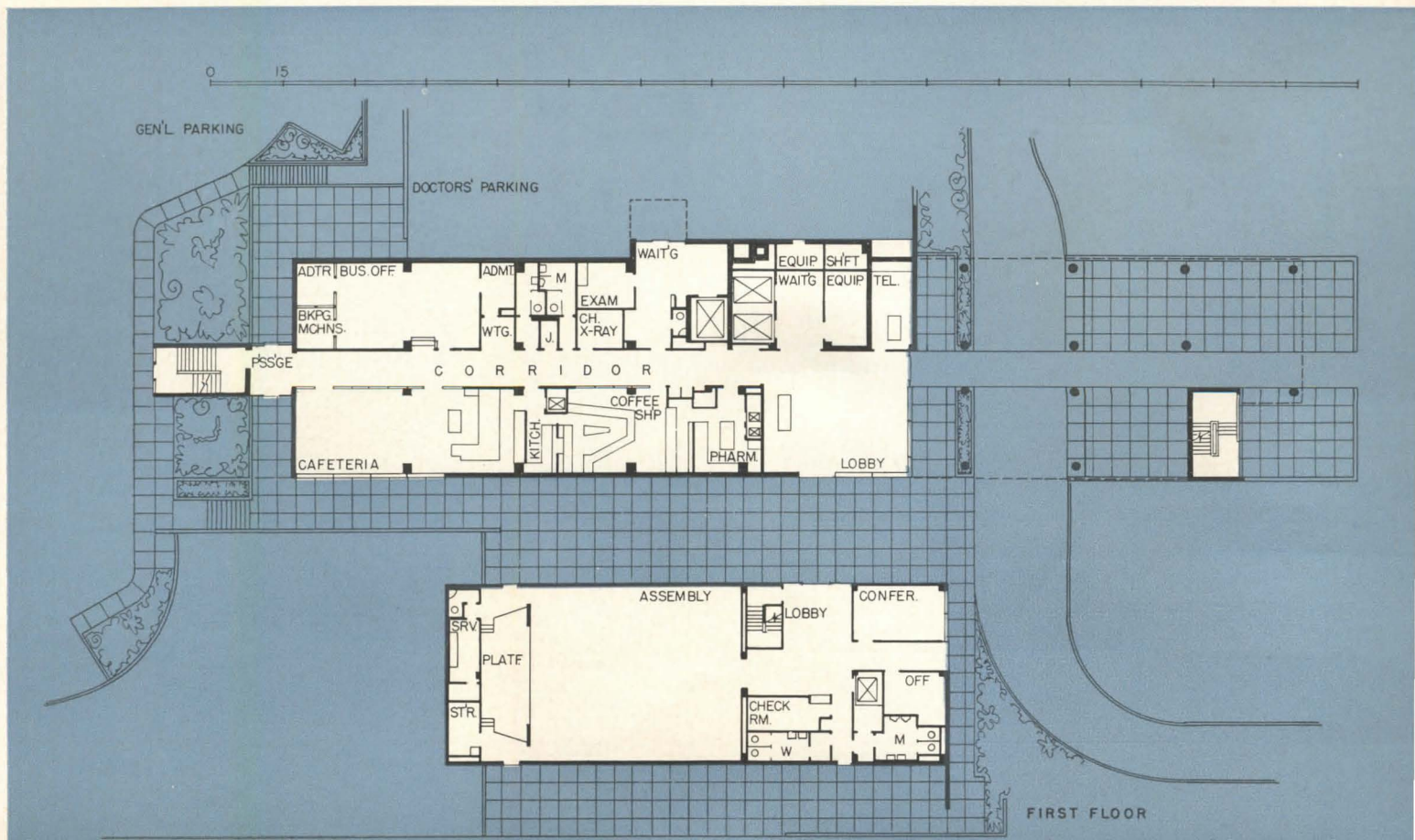
Arrangement of nursing stations on these floors is particularly interesting. The station itself is quite large, and has clustered around it utility rooms, diet kitchen, visitors' rooms, and bathrooms. The station is in the center of the nursing unit, immediately opposite the elevators. The handling of these 40-bed units involves a floor secretary, seated at the front of the nurses' station, to relieve the nurses of much of the non-medical work. This job is staffed from 8 A.M. to 10 P.M.

The second floor devoted to physical therapy and re-





Marvin Rand

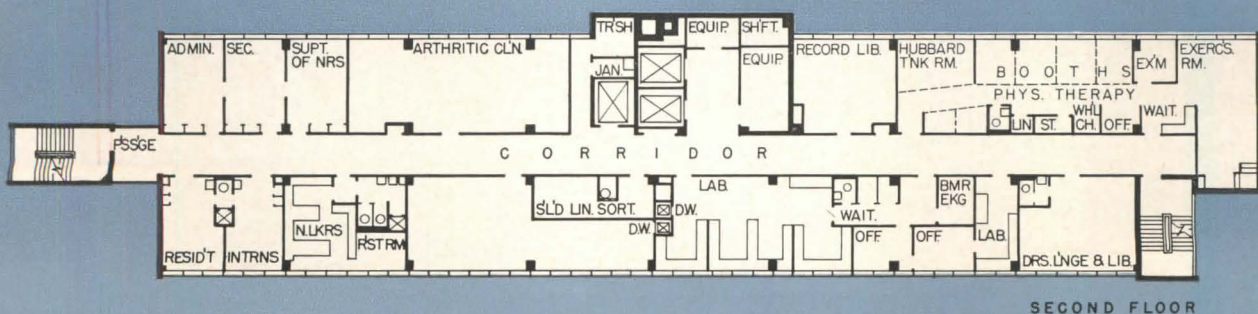
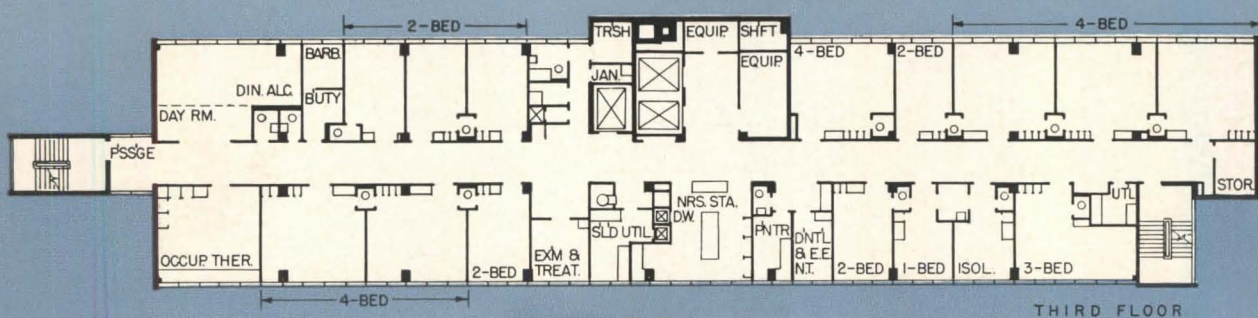
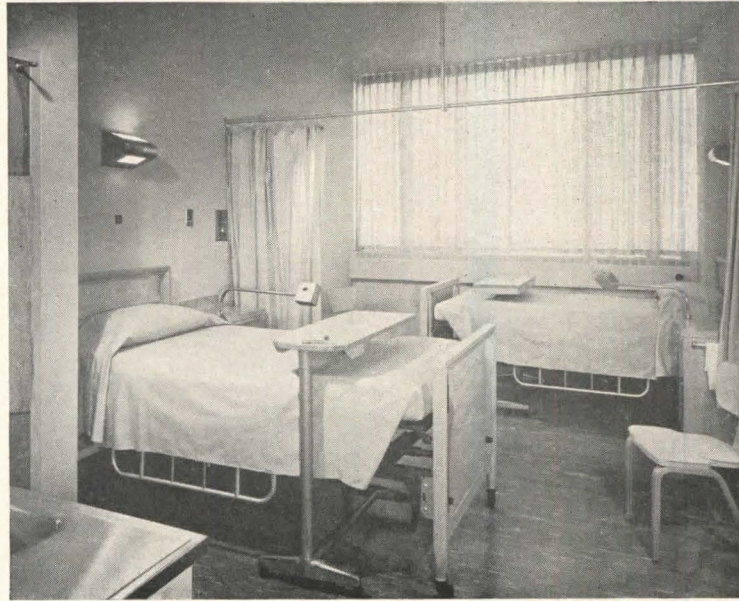
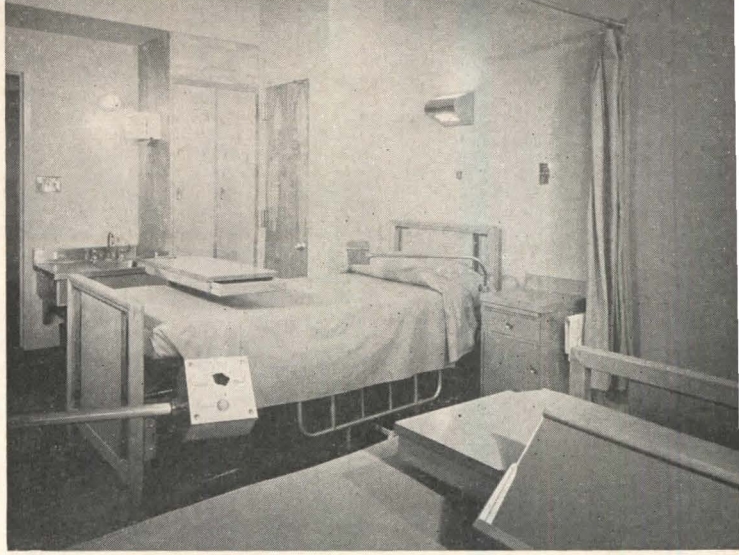


habilitation is especially noteworthy. It probably sets a new high for a general hospital in the lavishness of the equipment. This section is in charge of a doctor, over the physical therapists; notice that there are consultation rooms and examining rooms where patients may have individual attention, even private exercise booths for cases needing psychological help with their exercises. There is space on this floor for a dayroom with special dining facilities; in general, rehabilitation patients profit from contact with each other and from a spirit of competition in their struggles to improve.

Unusual in hospital design is the three-story separate building housing auditorium and office space. Fund-raising is important to a hospital so definitely charitable as this one, and will be handled from separate offices here. The auditorium will be used for a wide variety of social and charitable activities.

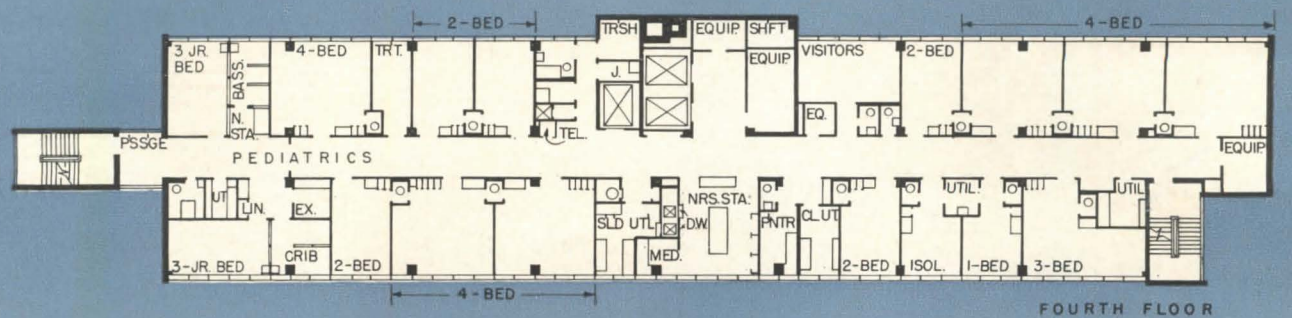
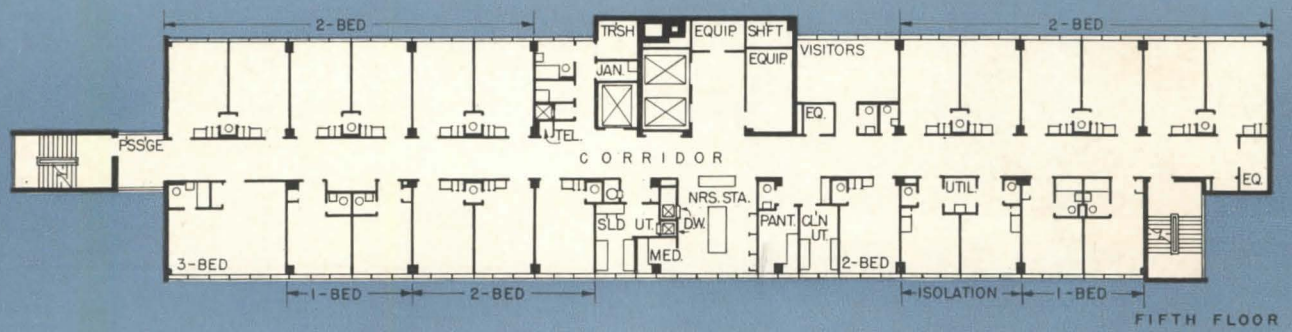
Completion of the proposed six-story wing and the added stories atop the main building will bring the bed capacity up to around 450. This will call for some additions also to various departments, which may result in some horizontal extension of lower floors.

The site, containing something over three acres, will eventually introduce some problems, especially in the matter of parking. The vertical concept of the building was of course dictated by the limitations of the plot, but this idea is not so readily available for the automobile problem. The master plan leaves this item for future consideration, with the recommendation that more land be acquired when the additions go forward.

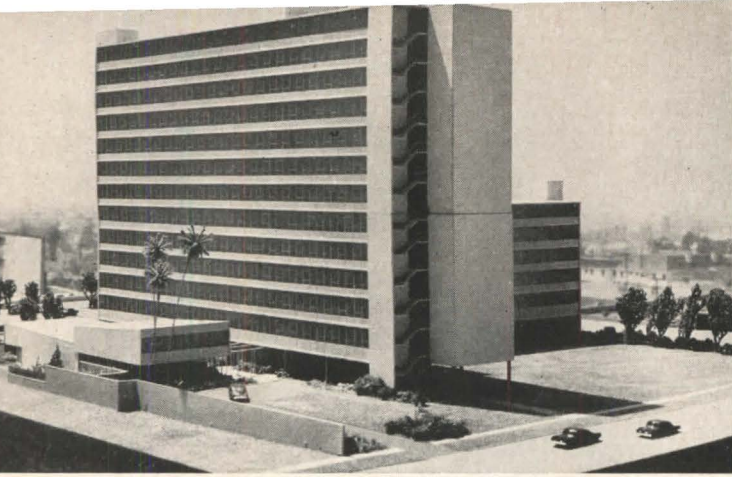




Marvin Rand



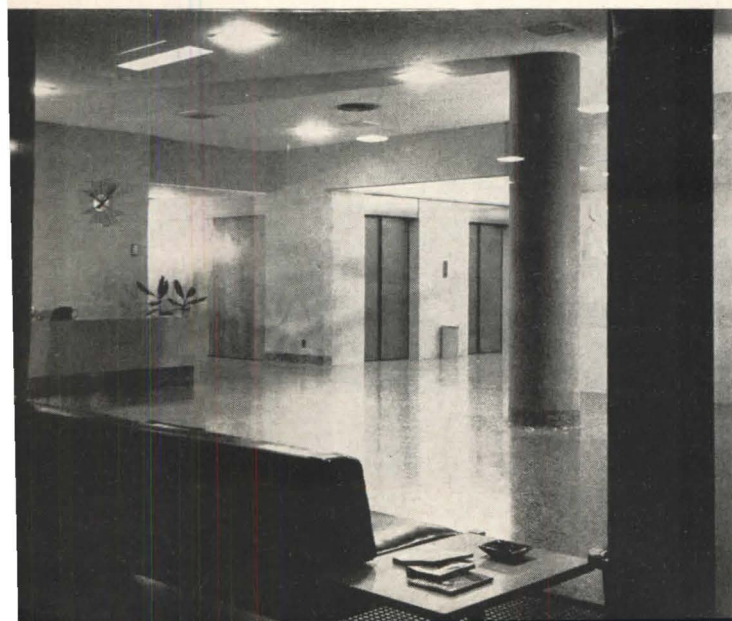
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Douglas M. Simmonds



Marvin Rand



HOSPITALS

STATEMENT OF APPROXIMATE FINAL COST MT. SINAI HOSPITAL AND AUDITORIUM

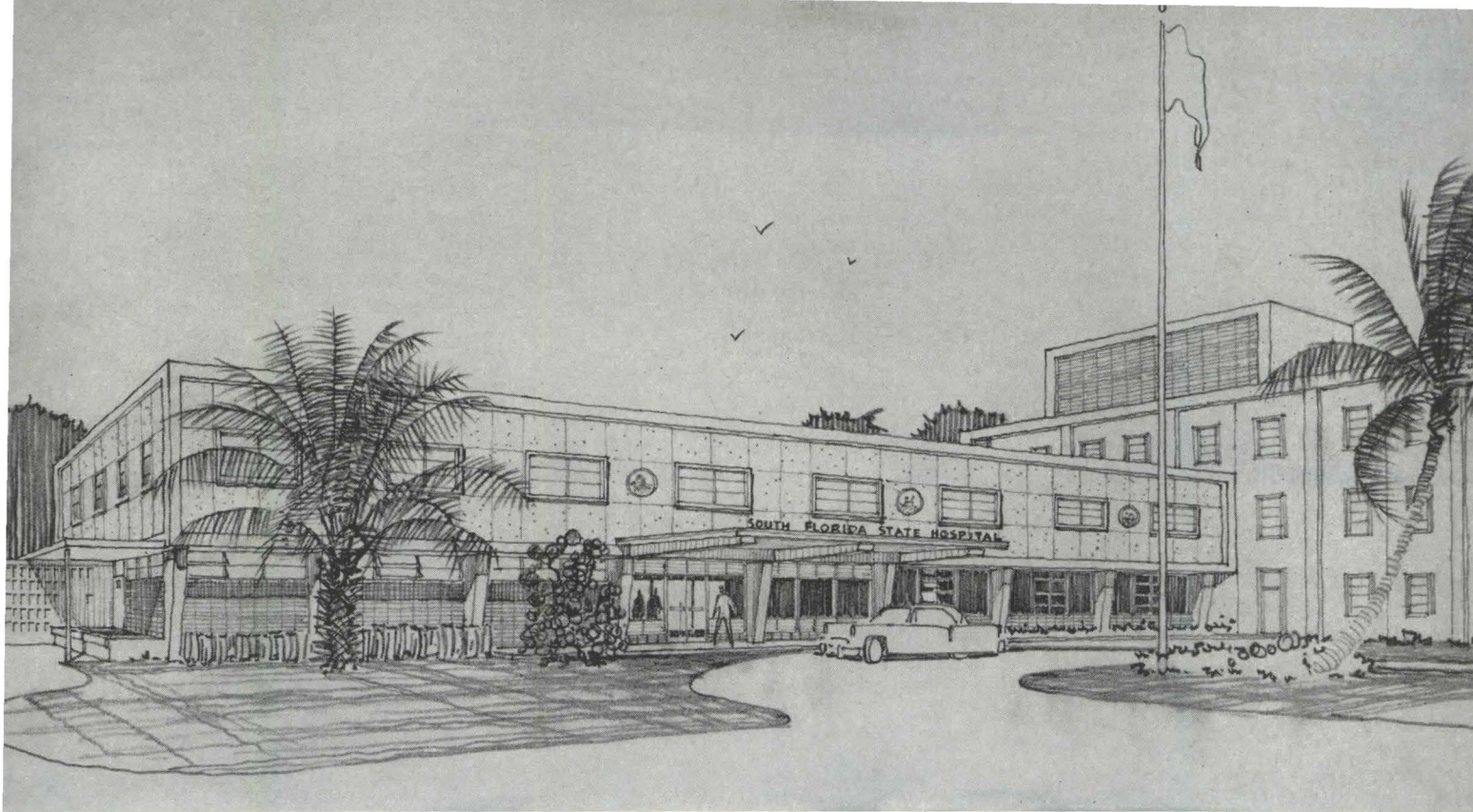
Hospital Building and Auditorium

Building Structure Cost	\$1,792,877
Added Costs due to sub-surface	
water problem	56,400
Elevators and Dumbwaiter	152,175
Plumbing	280,000
Sprinklers	10,000
Heating and Ventilating	160,000
Air Conditioning (Surgeries only)	100,000
Kitchen equipment	45,000
Sterilizers and O.P. Lts.	15,000
Paging System & Intercom System	39,000
	<u>\$2,651,052</u>
Builder's Fee	95,723
TOTAL COST	<u>\$2,746,775</u>

Cost of Auditorium (3 floors)	\$ 200,000
Cost of Hospital Bldg. Proper	<u>2,546,775</u>
Approx. Total Constr. Cost	<u>\$2,746,775</u>

	<i>Floor Area</i>	<i>Bldg. Cube</i>
Hospital	114,965	1,262,760
Auditorium	9,160	111,310
	<u>124,125</u>	<u>1,374,070</u>

	<i>Cost per sq ft</i>	<i>Cost per Bed</i>
Auditorium	\$21.48	
Hospital	22.16	(252 Beds) @ \$10,106



NEW STATE MENTAL HOSPITAL PLANNED FOR MODERN INTENSIVE TREATMENT PROGRAM

SOUTH FLORIDA STATE MENTAL HOSPITAL, Miami, Florida

Gamble, Pownall & Gilroy; Edwin T. Reeder Associates; Architects

Rally and Ross, Structural Engineers; G. L. Cadenhead and E. A. Hussar, Mechanical Engineers

IN RECENT YEARS it has come to be recognized that new intensive treatment programs for nervous or mental patients have so changed the requirements for mental hospitals that virtually new building types are needed. It is now held that with proper buildings and facilities coupled with modern therapy the great majority of mental patients can be cured and returned to society, rather than remain a burden to themselves and to the state.

The South Florida State Mental Hospital, just now going forward, is one of the first to accept in toto the newer theories, as these were presented in *ARCHITECTURAL RECORD* in Nov. 1953. In that issue Alston Gutterson, then hospital architect for the Public Health Service (now architect for the architectural study project of the American Psychiatric Association), concentrated heavily on the "receiving and intensive treatment" facility of the mental hospital, where the cure-not-mere-care program is initiated. South Florida begins its building program in this direction; though it will eventually be a complete mental hospital of around

1600 beds, its first \$5,000,000 appropriation will be used to build the receiving and intensive treatment section, with convalescent cottages, plus the medical and surgical hospital portion. A master plan has been prepared, but there is a disposition to see the intensive treatment idea in action before freezing a scheme for other classifications of patients; it is hoped at least that the cure rate will be high enough to modify plans for housing chronic categories.

This hospital also follows other tenets set forth in the same study. Its buildings are planned in small one-story units, so that patient groups are kept small and patient types — quiet, depressed, disturbed, and so on — are segregated to the fullest extent. Enclosed or fenced-in patios are planned to give patients full opportunity to be outdoors with a minimum of restraints. It will be a large hospital done at small scale, with a maximum of the intangible but highly valuable therapeutic amenities of pleasant, comprehensible environment. There will also be a great outlay of recreational and occupational facilities to encourage participation and

activity, which after all are the most hopeful avenues to mental health.

The fortunate circumstance in this instance was that this was a completely new hospital, not saddled with an existing overload of patients or complex of obsolete buildings. With its fresh beginning it could institute a progressive program with the confident hope of reversing the old familiar story of introducing new patients into hopeless surroundings, and establishing a cure rate that would offer maximum relief for the existing mental hospitals.

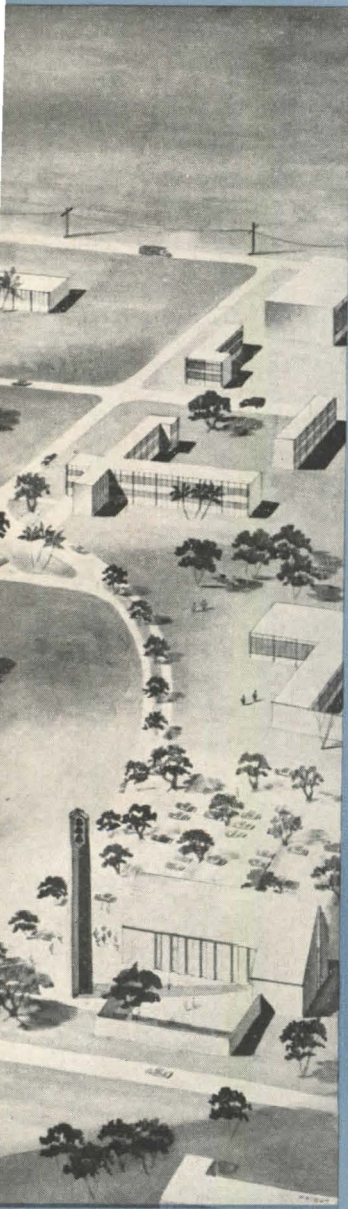
The architects' commission provided that they should make a survey to establish criteria. They made a two months' survey of mental hospitals, and indeed a study of medical practices. Their report to the state was a veritable short course in mental hospital techniques as well as a report on specific hospitals and a very cogent argument for the modern intensive treatment approach.

For example, "the hospital which expends its funds on custodial care to the virtual exclusion of intensive treatment is, in a sense, committing suicide. Without a program of active treatment applied to nearly all patients the hospital can look forward only to the steady growth of bed capacity and the state to a whopping bill for patient maintenance which yearly increases with the inexorable complacency of a cancer. . . . Without exception, every psychiatrist and administrator contacted eagerly discussed and vigorously urged that we seriously concern ourselves with this aspect. . . . If ever the state governments are to realize a reserve of beds . . . it will appear and increase in exact proportion to their concern with and promotion of intensive treatment."

Hence the determination to apply the first funds to the receiving and intensive treatment part of the whole complex, including the convalescent cottages. This is, roughly, the lower half of the site plan on page 221,

All renderings by John Storrs, A.I.A., Fred Stressau, landscape architect





MASTER PLAN

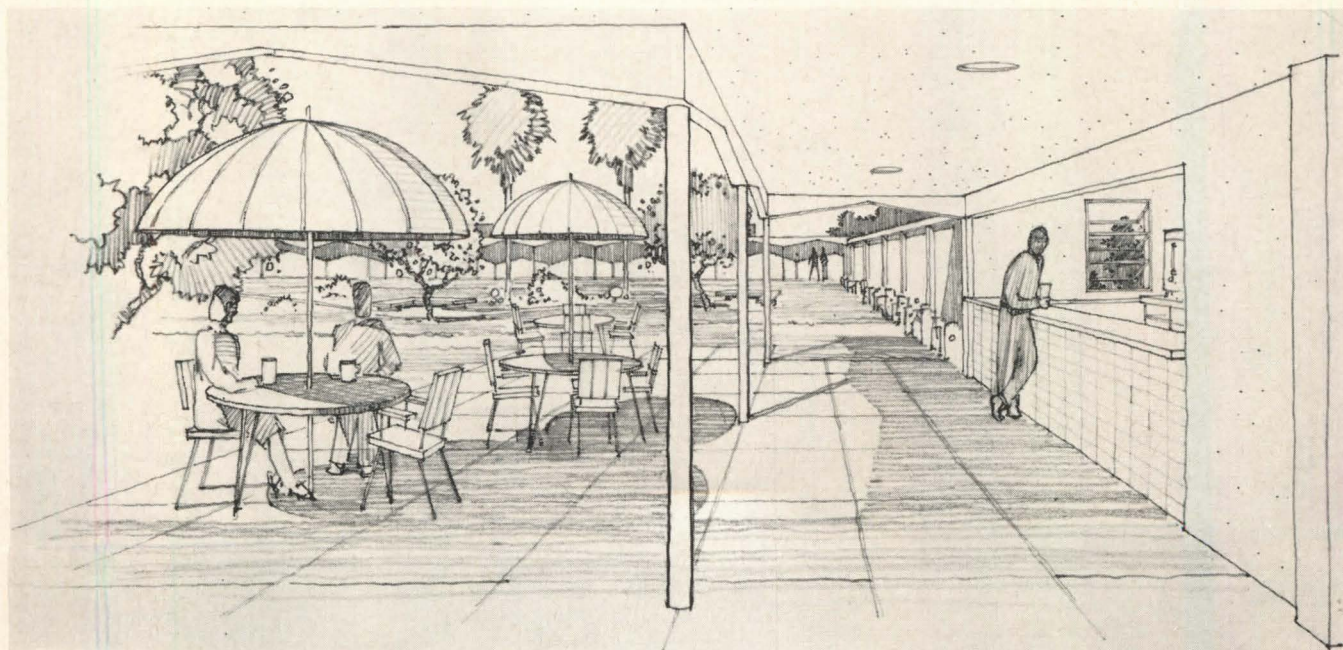
Master plan shows classification as well as housing scheme for a mental hospital of something over 1600 patients. The lower half of the plan is the portion presently being built. This is the receiving and intensive treatment section, including medical and surgical, tuberculosis and some geriatrics buildings, where the modern program of quick cures will be given a thorough try-out



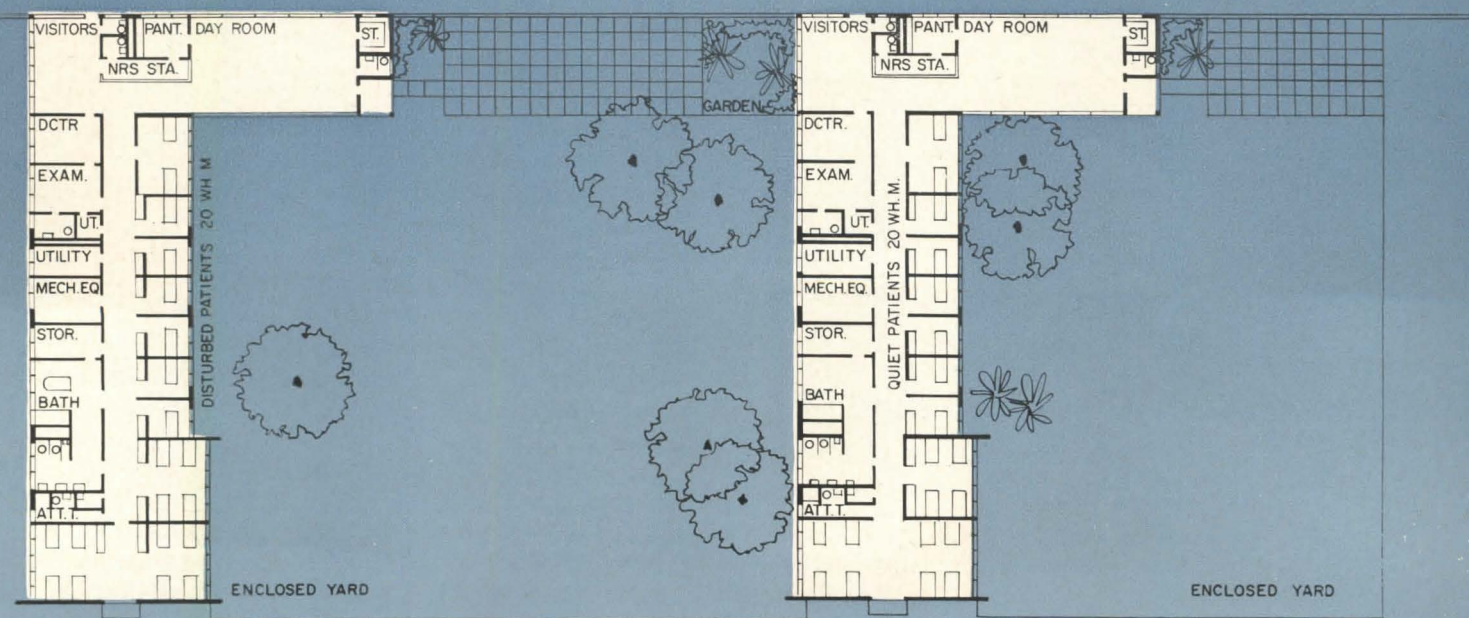
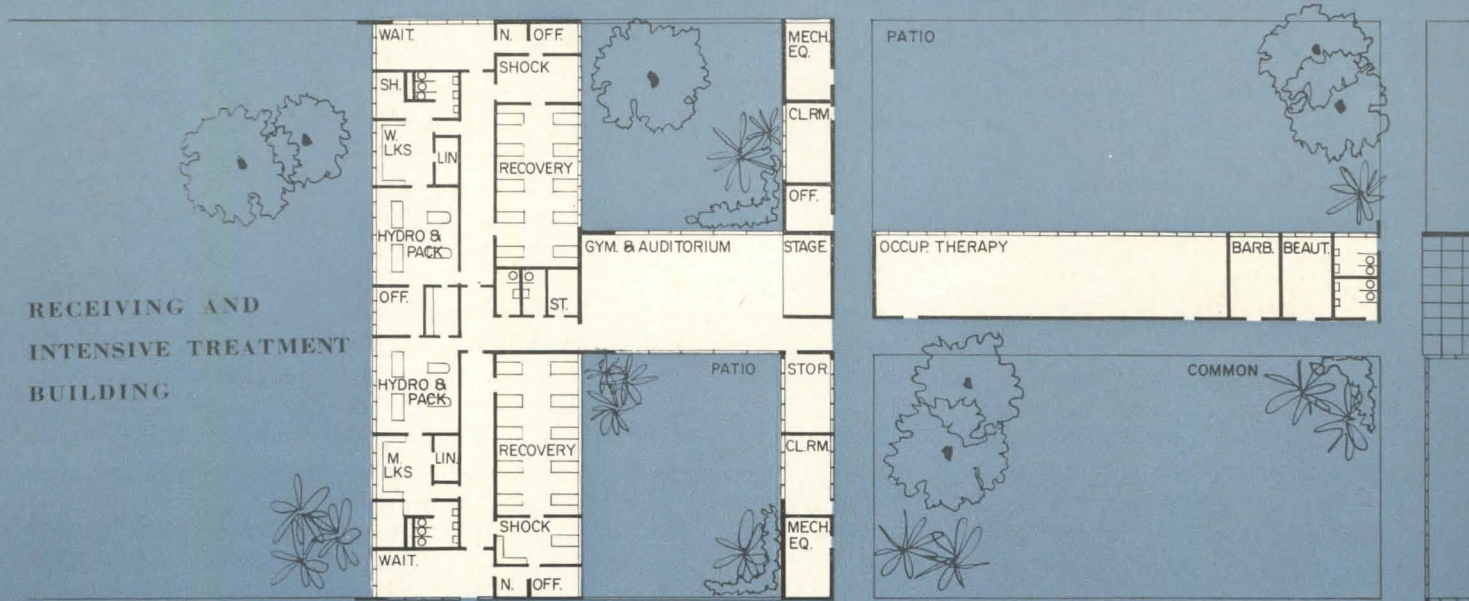
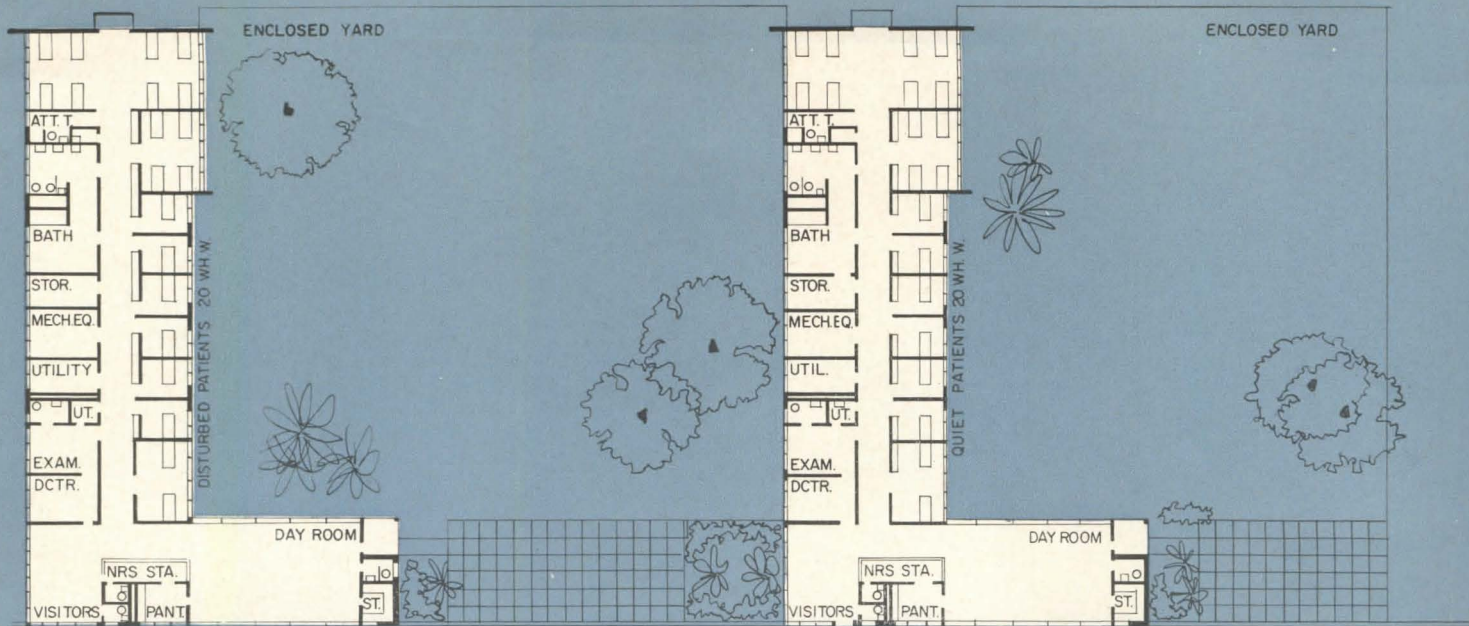
COST BREAKDOWN OF SOUTH FLORIDA STATE MENTAL HOSPITAL

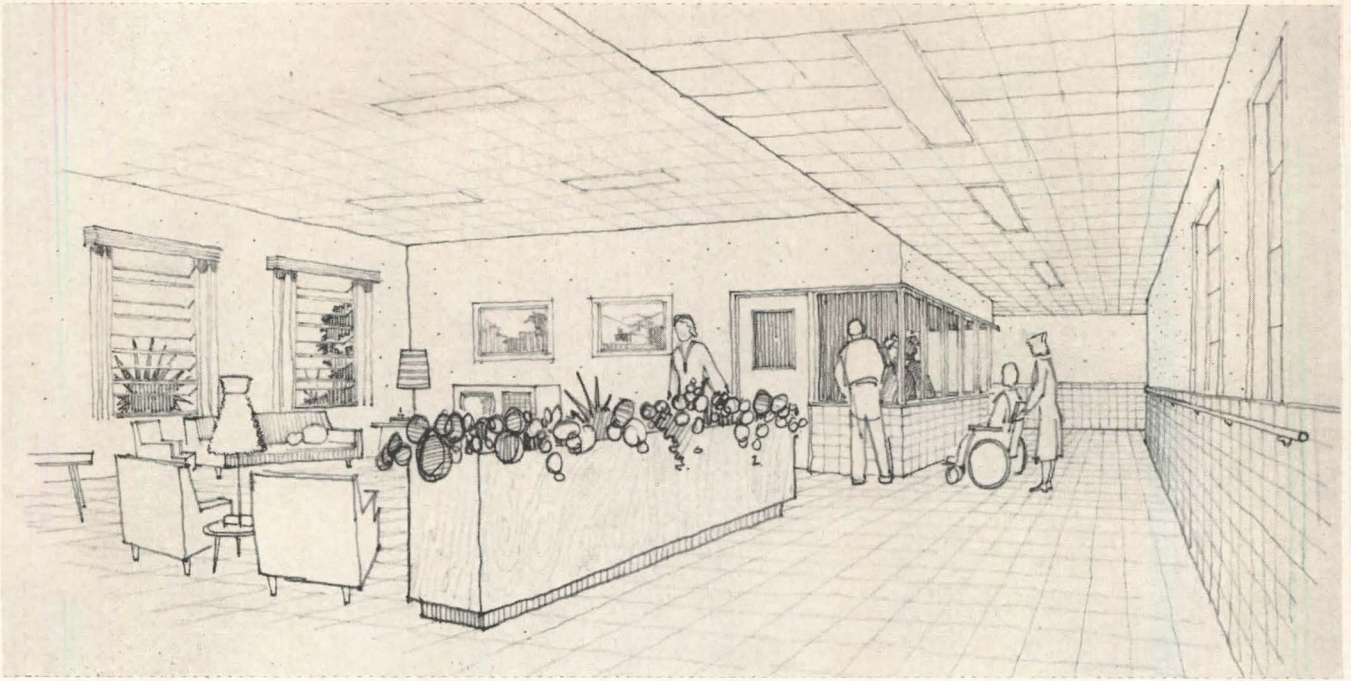
<i>Building</i>	<i>Sq. Ft.</i>	<i>General Const.</i>	<i>Mech. Elec.</i>	<i>Integral Equip.</i>	<i>Contract Cost</i>	<i>Unit Cost Sq. Ft.</i>	<i>Unit Cost per Bed</i>	<i>Notes</i>
Medical-Surgical	74,616	\$902,043	\$211,700	\$71,600	\$1,185,393	\$15.90	\$16,463	Present 72 bed. Services provided for future 192 bed addition.
Rec. & Acute Treatment	94,085	689,706	271,776	6,000	967,482	10.25	8,062	120 Bed includes Loggias
Kitchen-Dining	17,594	98,099	35,420	164,000	297,519	16.90	615	Serves 500-600
Convalescent Cottages	53,412	353,212	139,026	—	492,238	9.25	2,567	Six at 32 bed each
Gate House	220	3,358	1,000	—	4,358	19.80		
Nurses' Home	8,378	101,048	22,924	1,000	124,972	14.88		27 Single Rooms & Apartments
Laundry	9,760	46,674	35,000	500	82,174	8.30		Equipment not included — allow \$35,000
Boiler Plant	2,816	22,362	107,869	—	130,231	46.15		
Warehouse	14,324	63,687	10,800	—	74,487	5.20		
Geriatrics	27,254	229,274	101,100	21,000	351,374	12.90	3,514	100 Bed Unit
Residences	8,300	52,571	21,685	2,500	76,756	9.20		Five 3 Bedroom
	310,759	\$2,562,034	\$958,300	\$266,600	\$3,786,984	\$12.18	\$ 7,825	
Exterior Services					395,526			Water, Sewer, Elec., Landscaping
Sub-total, General					\$4,182,510	\$13.48		
Sewage & Water Plant					245,700			
TOTAL					\$4,428,210	\$14.25	\$ 9,108	

General Note: Furnishing, Fees and Miscellaneous Cost Budget — \$571,790.00



Typical snack bar and dining patio adjacent to the exercise gardens, near dining rooms and occupational therapy. Outdoor areas like this are an important part of the scheme, to give patients every encouragement to enjoy the outdoors and the landscaping, and to create an environment conducive to friendly contact with others





Typical hall and dayroom, with planting box giving partial separation of the two. Nurses' observation gallery overlooks both areas

including some of the staff housing but not the tuberculosis hospital. The site, incidentally, comprises 300 acres 8 miles northwest of the business center of Miami.

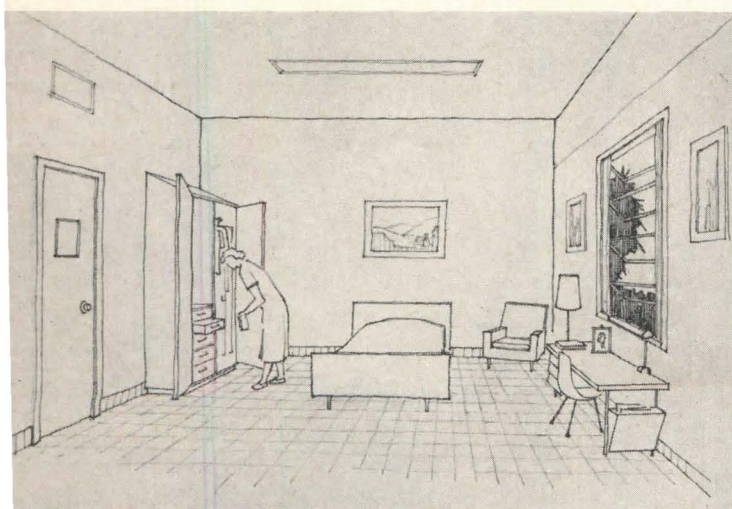
Receiving wards for the intensive treatment of the acutely ill with a favorable prognosis are developed in two attached units, one for colored and one for white — to care for 20 per cent of the patient load. Arranged in receiving nursing units of 20 patients each and con-

nected by open loggias with the physical and psychological treatment areas, this unit, with its kitchen and dining facilities, is in effect a complete mental hospital in miniature. Six 32-bed convalescent cottages surrounding this receiving center will accommodate two-thirds of the patients in the acute treatment group.

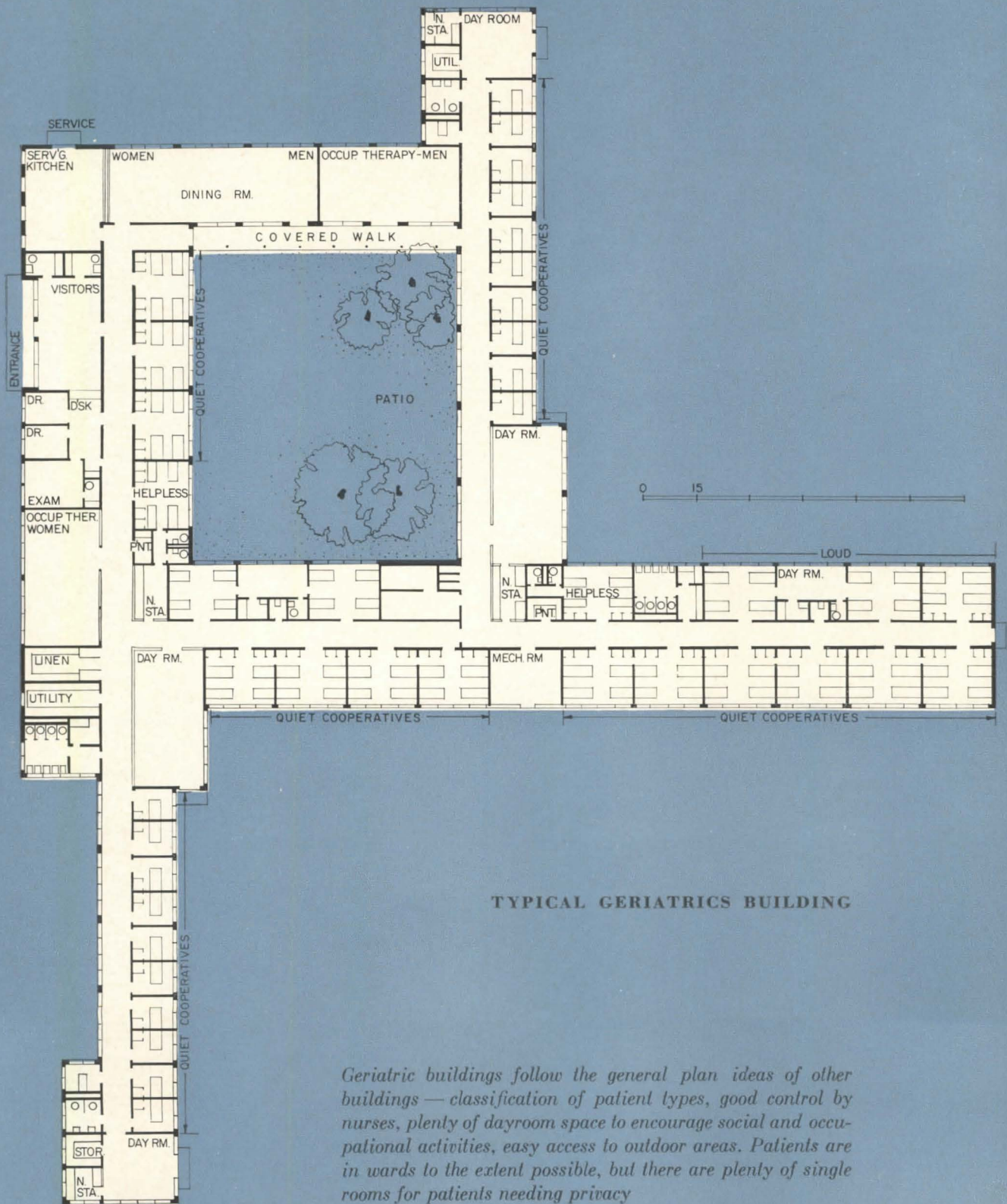
The receiving center is connected by direct passage to the multi-story medical and surgical building, with 72 acute disease beds, for some five per cent of the total population. Facilities provided include a complete physical diagnosis and treatment section. Connected with this building there will be an administration section of two stories, at the physical and theoretical center of the plant.

The master plan also calls for: prototype buildings in groups of three, for chronic patients, estimated at half of the total population. Chronics are divided into groups as follows: "industrial" patients in three single-story buildings, 60 persons each; "inactive" patients in three single-story buildings, 40 each; "chronic diseased" patients, 192, housed in the medical-surgical complex; geriatrics — 20 per cent — in three identical 100-bed single-story buildings; tubercular, 78 beds, in one single-story building; and criminally insane in a maximum-security building of 60 beds, plus a 16-bed ward for psychotic drug addicts and alcoholics.

Considerable effort has been made to orient all patient living quarters toward the south or east, in order to take advantage of the southeast tradewinds which make South Florida comfortable in midsummer. Mechanical ventilation units will assure a cross ventilation

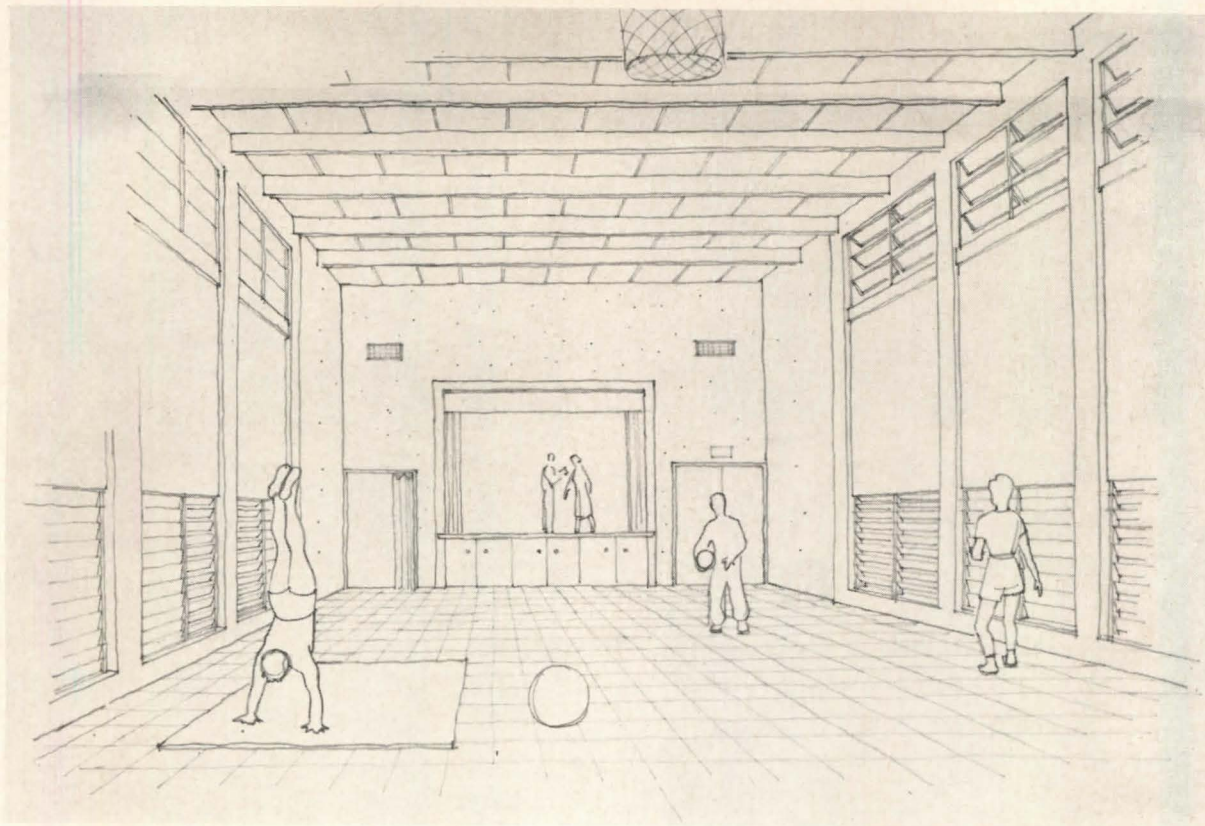


Typical quiet single room, measuring 10 by 12 feet with 10-ft ceiling. Furniture, while sturdy, will be "non-institutional" in character; walls smooth cement plaster, floors of vinyl plastic



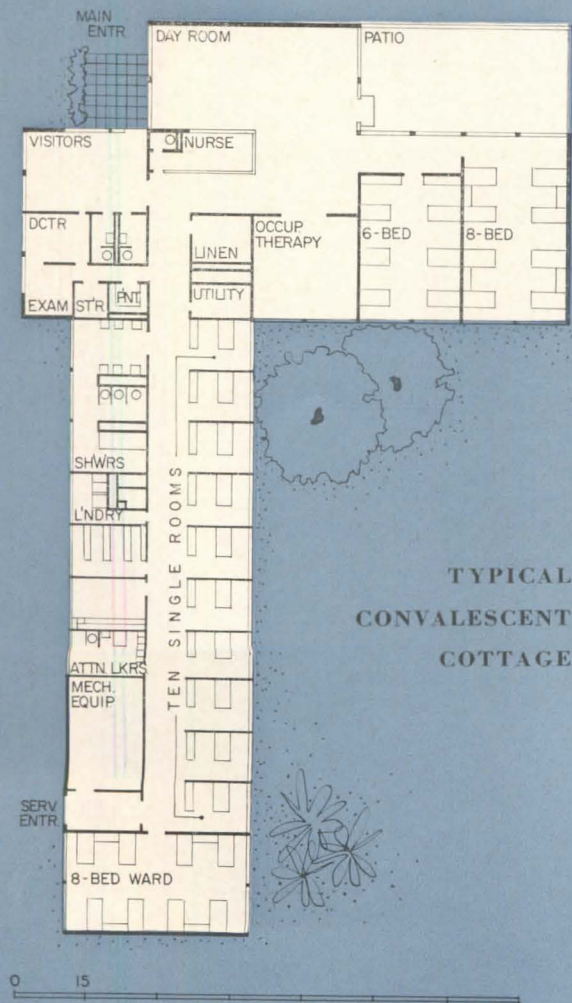
TYPICAL GERIATRICS BUILDING

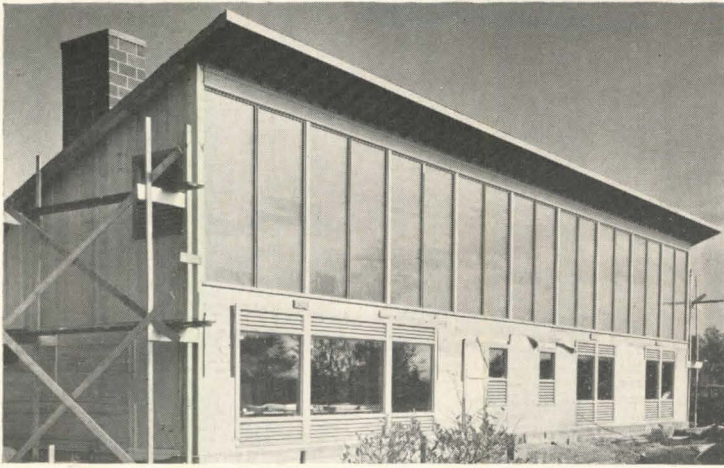
Geriatric buildings follow the general plan ideas of other buildings — classification of patient types, good control by nurses, plenty of dayroom space to encourage social and occupational activities, easy access to outdoor areas. Patients are in wards to the extent possible, but there are plenty of single rooms for patients needing privacy



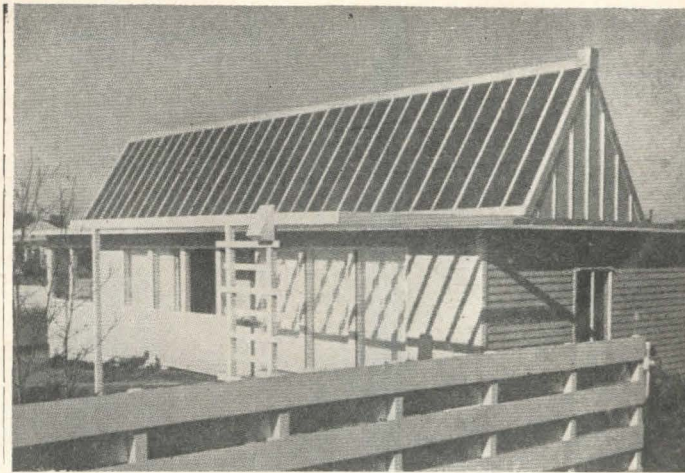
during the occasional absence of these benign breezes. Whenever a patient's room is located with other than an east or south exposure, it is expected to be provided with air-conditioning and inasmuch as these are the locations of the loud or disturbed segment of the various sections, such air-conditioning serves the double purpose of sound control where it is most important. Throughout the project A.P.A. minimum area criteria have been met or exceeded, providing 120 square foot minimums in single rooms, 8 foot bed centers in wards of which eight beds is the maximum, and 40 square feet per person of dayroom space. A.P.A. toilet and bath criteria will also be observed.

"We fully realize," say the architects, "that a proper and adequate disposition of functional elements and spaces in the hospital is not sufficient in itself to provide a satisfactory treatment center for mental disorders. Budget and functional requirements — not the least of which is personnel — direct our attention to building methods and aspects which may not be the most visually desirable from either a therapeutic or artistic point of view. However, *within the bounds of these controls it is our firm intention — in accordance with the pleas of the medical profession — to pursue that elusive quality in building which transcends the purely material. It is hoped that here will be some elements of that 'environment of good cheer and hope' . . . that place where the patient may 'find a situation in which he is acceptable . . . that garden where a man may find himself again.'*"





AR—March 1949



AR—April 1949

The first two widely publicized experiments in residential solar space heating were the M. I. T. Solar House (right) and the Dover House (left), both in the Boston area. The Solar House used glass and metal collector plates and water for storage. The Dover House system, conceived by Dr. Maria Telkes (Eleanor Raymond, architect), collected heat by means of vertical glass and metal plates and stored it in Glauber salts

SOLAR SPACE HEATING FOR HOUSES

THREE YEARS AGO a prediction was made by the President's Materials Policy Commission that by 1975 there would be 13 million houses in the United States which would be almost entirely heated by the sun. Since that time little progress has been made toward proving the prophecy. However, progress has been made in the amount of research which has been done on the subject.

One of the foremost groups in advancing the study of solar energy and its practical utilization is the Association for Applied Solar Energy, an organization which was formed in Phoenix, Arizona, just last year by a group of men representing industry, agriculture, finance and education. The Association has already produced a library and a comprehensive bibliography on the subject, and its most significant undertaking to date has been a World Symposium on Applied Solar Energy. Attending this conference in Phoenix early this month were architects, engineers, scientists and businessmen from all parts of the world, who gathered together to discuss recent developments, and their significance for the future, in the field of solar energy. In the realm of space heating they viewed and reviewed some of the most important projects, from which some pretty consistent conclusions can be drawn: Collectors should face south to

take maximum advantage of the sun. They should be tilted to meet the sun's rays directly during the coldest part of the year, although this has been sacrificed in favor of house design in some cases. And storage should be within the house envelope, so that what little leakage there may be will not be entirely lost to the house. Although some research has been done in the northerly latitudes of the United States, it is pretty generally agreed that most of the hypothetical 13 million houses will be in the southern half of the country, and that even some of these will have to be supplemented with small auxiliary heating systems.

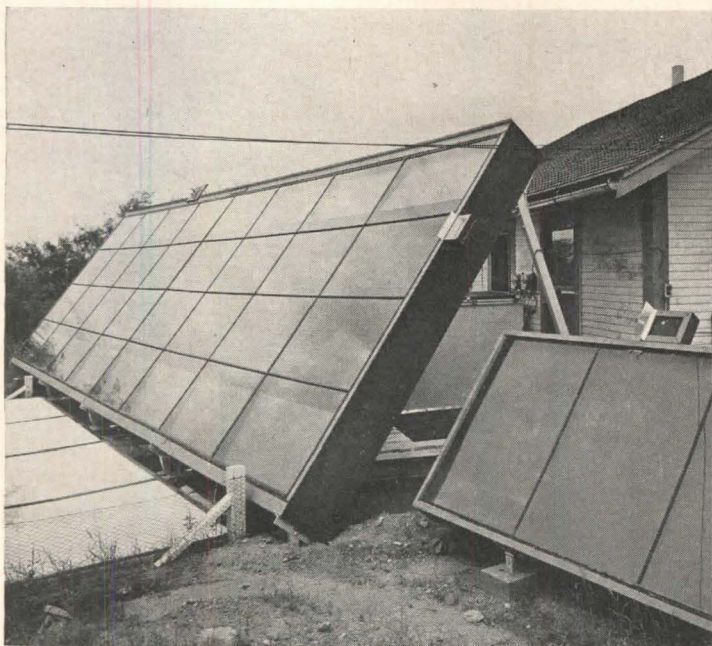
Whether the 13 million figure will be realized in 1975 is anybody's guess. However, the goal will certainly be more attainable with the sharing of knowledge and experience that will have resulted from the World Symposium. A few of the projects that were scheduled for presentation — some, houses that have already been constructed, and others simply on the boards — are discussed on these pages. There are basic facts, and basic problems, that are evident in all of them:

1. *Cost, first and foremost.* The first cost of collector and storage devices is still higher than the fuel expense and cost of the less expensive conventional

heating systems. It is generally hoped, however, that with further development of solar heating equipment and its production on a quantity basis, the total cost of solar heating and air conditioning can be brought below the corresponding costs with fuel- or power-operated systems.

2. *Storage media and size.* Water and gravel have proved to be the most widely used storage media to date, with some attention being given to heat-of-fusion materials, such as salt hydrates. The size of storage areas will depend ultimately on the finding of a low-cost storage material which will have a relatively high storage capacity per unit volume.

3. *Architecture.* Some utilization of the sun is obvious in much of our house design today. Site selection and orientation, use of tree shade, design of windows to admit winter sunshine but exclude it in summer, and selection of materials with consideration for their heat-storage capacities are in fairly common practice. It remains to decide whether the actual solar heat collecting and storage devices will strongly influence the appearance of future houses or whether they will fit the pattern of architectural thinking. Both have been tried, and in most cases the result has been somewhat of a compromise.



AIR AND GRAVEL SYSTEM

DONOVAN & BLISS, a small heating and ventilating firm in Amado, Arizona, specializing in problems of practicable utilization of solar heat, have put together this experimental heating-cooling system. Freely termed by its designers as an "architectural monstrosity," it was attached to an existing house which was not adapted to solar heating. Paradoxically, it is the only *fully* solar-heated house in actual operation in the United States today. The house is a 25-year-old frame structure, a Desert Grassland Station belonging to the U. S. Forest Service in Arizona, where the average January temperature is about 48 F. It has a floor area of 672 sq ft and is fairly well insulated.

The collector is a 315-ft-square, flat, non-focusing type tilted to face the midday sun squarely on January 15. An interior arrangement of black cloth screens absorbs the incident sunshine and transfers the resulting heat to the circulating air. The air is carried either directly to the house through distribution

HORIZONTAL PLATE COLLECTOR

JAMES M. HUNTER, an architect from Boulder, Colorado, has designed a house in which is incorporated a solar heating system engineered by Dr. George O. G. Löf, consulting engineer from Denver. It is expected that the house will be constructed in Denver. The collecting medium and circulation system are similar to those of the Bliss set-up, with air circulating through a storage bed of gravel. However, as can be seen in the cross section on the opposite page, the

ducts (not shown above) leading to wall registers or through a heat-storage rockpile. When the air is circulating through the rockpile, it flows from bottom to top and then back across the heated screens. When the rockpile is delivering heat, the air cycle is reversed to flow down through the pile and into the ducts.

The rockpile, located behind the collector and adjacent to the house, is filled with 1300 cu ft of 4-in.-diameter field rock. Three walls of the 10- by 12- by 12-ft storage area are insulated with 7-in.-thick insulating concrete; the floor has 4 in. of the same material; and the roof is covered with the equivalent of 8 in. of mineral wool. The wall next to the house is not insulated, so that any heat leakage will be absorbed into the house. Two centrifugal fans and motorized dampers are housed in an insulated box on top of the rockpile. The small collector to the right in the photograph is for domestic water heating.

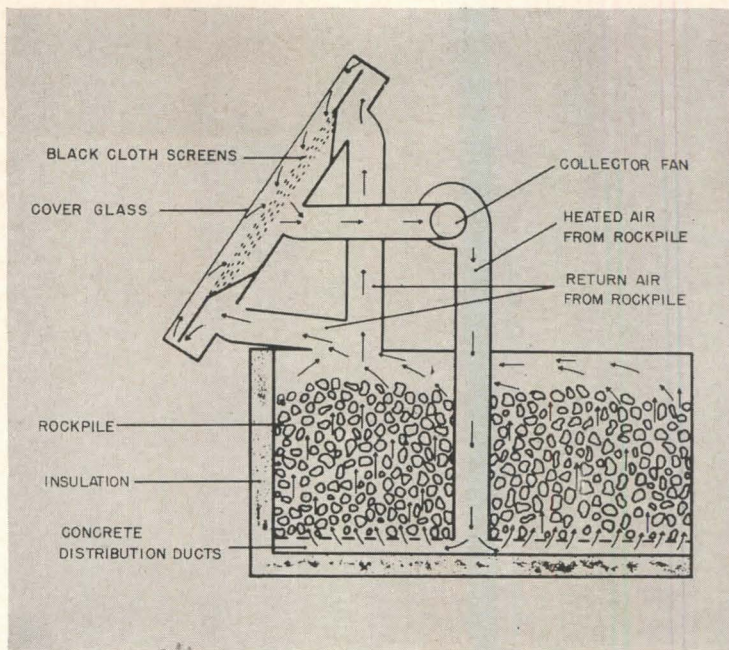
The white patch in front of the collector is a "night radiator" for summer

cooling. This 280-sq ft porous screen loses heat by radiant exchange with the night sky. Cool night air is drawn through it into the rockpile and then, on demand, circulated into the house. During cooling tests last summer, it was reported that a "tolerable indoor comfort level was produced, noticeably better than that produced by the conventional evaporative cooler operating in the locality during the humid months of July and August."

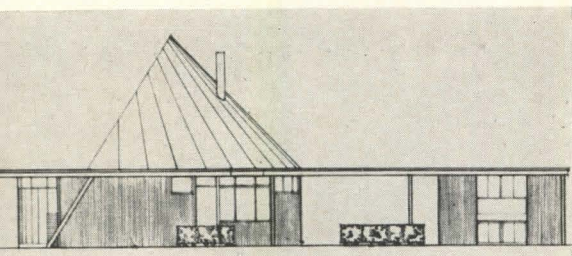
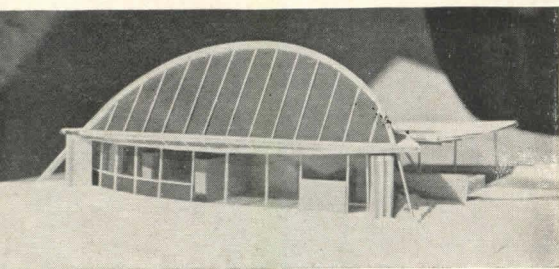
The designers feel that, although the collector appears to be large and awkward, it could fit into the roof or wall of a properly integrated structure. They have calculated that a copy of the system, including house ducts, installed in a moderate-sized house designed for it in the southwest, would cost between \$2000 and \$3000. With winter operating costs averaging \$2 per month and summer costs \$4 per month, they say that the excess amortization costs of the system over a conventional system would only slightly overbalance the fuel savings.

proaching 200 F. Mr. Hunter supposes that storage of heat for a three-day period will be possible.

In 1946 Dr. Löf and Mr. Hunter conceived another solar-heated house with collector and storage system similar to this one, but designed into a "sloped roof house, very conservative in its architecture, very 'palatable' to the speculative builder and the average house owner." Both projects were sponsored by the American Window Glass Co.



Air Conditioning, Heating and Ventilating, October 1955



WATER SYSTEM

DONALD F. MONELL, an architect from Gloucester, Mass., formerly with the M. I. T. Solar Energy Research Project, has designed a small semi-circular house with what he calls an "orange-peel" roof collector. The semi-circular form was used in order to satisfy requirements of maximum south window area for supplementary heat gain and minimum heat loss for the rest of the area of the house. This is not perfect design, Mr. Monell admits. "Any design for pleasant living is bound to be a compromise. A cave deep in the earth would be the best from the heat loss point of view."

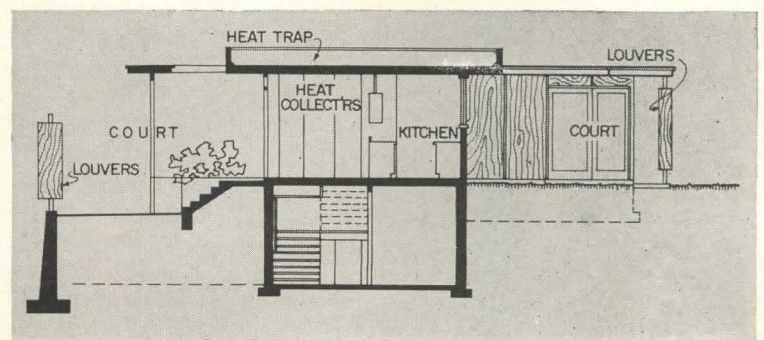
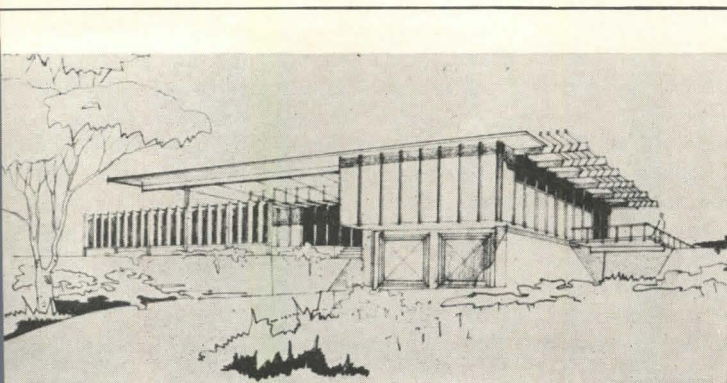
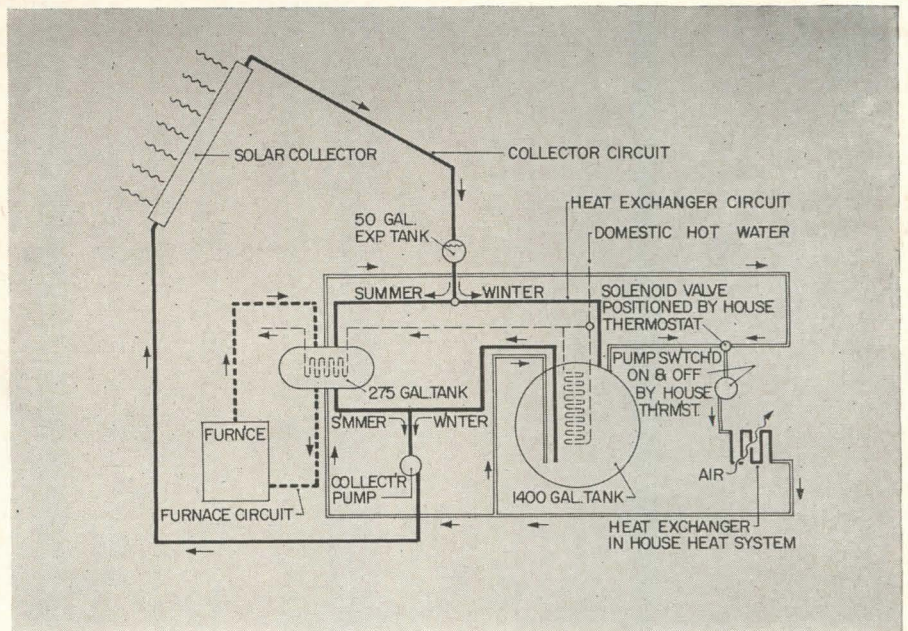
The structure of the house will consist of a sloping laminated wood arch (the orange peel) supported by laminated wood struts. Interior bearing walls will be limited to a utility core where the plumbing will be concentrated. The other partitions in the house will be only 6 ft high, so that there can be free air flow through the entire area.

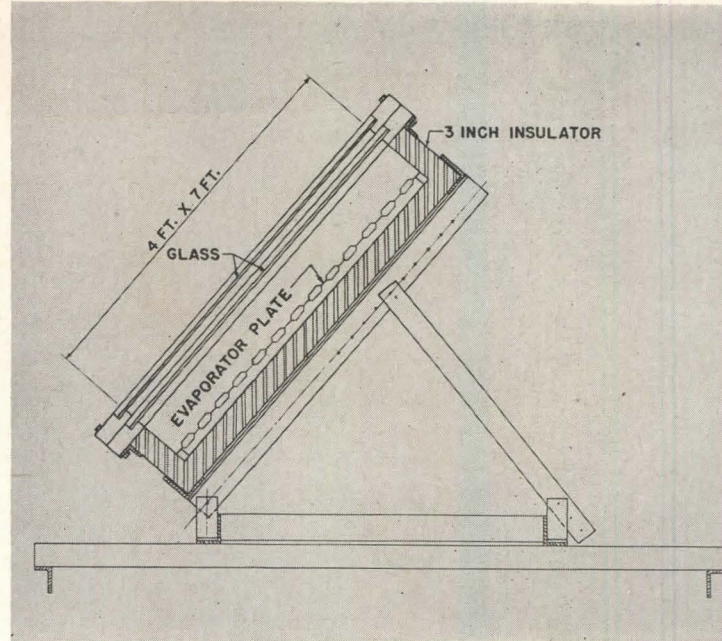
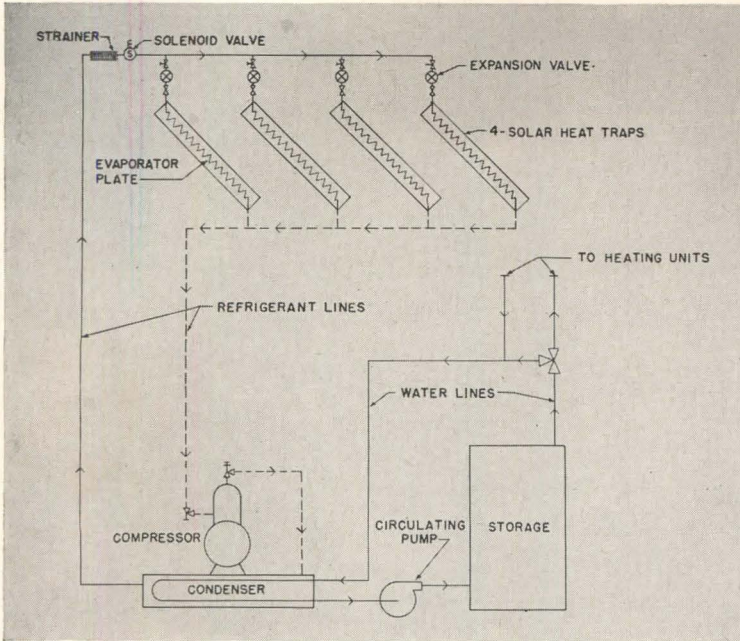
The heat collecting and storage system is similar to one designed by Austin

Whillier, formerly engineer in charge of the M. I. T. Solar House and now with the South African Council for Scientific and Industrial Research. The collector plate in the Whillier system, above right, consists of one or more glass plates spaced about $\frac{3}{4}$ in. apart, below which is a flat copper or aluminum plate painted black on the side facing the sun and insulated on the reverse side. Copper tubes soldered to the back of the plate absorb the heat from the plate, and water flowing through the tubes carries it to the house. In winter, as shown in the diagram, heated water is carried through the large 1400-gal tank, from which it is carried directly into the house heating system and also into the domestic hot water lines. In the summertime it goes through only the smaller 275-gal tank to supply domestic hot water needs. However, if cooling is desired, the summer heat can be transported through the larger tank, in which an evaporator coil can be inserted. If solar heat from the large tank is insuffi-

cient to keep the house warm in winter, the solenoid valve, energized by the house thermostat, connects the smaller tank into the system, and the house is serviced by the furnace circuit until the solar heat reservoir has been brought back to capacity.

In the Monell house water will be stored in several tanks, rather than one, so that the temperature of the water being introduced into the collector can be kept as low as possible. The storage tanks, located under the floor slab, will be of concrete with plastic linings. A heat exchanger will make possible a forced warm air heating system, with air distribution through high wall outlets. The flat portion of the roof in front of the collector is valuable not just as an overhang to reduce summer sun penetration into the house. It is a reflective surface which adds to the effectiveness of the collector. The south facing glass wall can take advantage of the sun, or can be closed off by folding doors to retain heat at night.





HEAT PUMP SYSTEM

THE AMERICAN GAS and Electric Service Corporation has been conducting studies since 1950 on the heat pump as a component of solar heat collecting systems. An experimental rig was set up on the roof of a one-story brick building near New Haven, W. Va., for field tests. The heat trap, as shown above, consists of four surfaces with a total exposed area of 112 sq ft. The sectional view above right shows the two removable glass covers, the heat-absorbing plates of 16-gauge steel fabricated to form parallel refrigerant circuits, the insulated enclosure and the supporting base. The trap was adjusted to face south at an angle of 50 deg from the horizontal. The flow diagram is identical with that of a conventional refrigeration cycle. The refrigerant is circulated between the evaporator plates and the condenser, changing from a liquid to a gas in the evaporator by obtaining the required heat of vaporization from solar and sky radiation. This heat is given up to the water circulating through the condenser,

thus completing the cycle and returning the refrigerant to a liquid state. The heated water is delivered to the storage tank for use in the heating and hot water systems.

Summer cooling is provided in this system simply by changing the direction of the refrigerant flow. The collector plate, free of glass covers or enclosure of any kind, serves as a "heat sink," collecting heat from the house and giving it off to the cooler night sky. The cooled water, which has lost its heat to the refrigerant in the condenser, is returned to the tank for storage.

An interesting result of the tests in West Virginia of AG&E, was that the recovery heat rate of the collectors was not seriously affected by removal of the glass covers. This is considered important for two major reasons: (1) Omission of the glass plates may be one of the most direct ways of obtaining a lower first cost trap, providing performance is not adversely affected. (2) It will enable the collector to use outdoor air as

well as direct solar heat as a heat source, thus increasing the efficiency of the collector, especially on cloudy days, and enabling the collector to give up accumulated house heat in summer to the cool night air. The fact that outside air can be used as a supplemental heat source, may make it difficult to justify economically, in a solar heat pump system, storage capacity in excess of a one-day supply. Another consideration in the sizing of storage tanks, and, for that matter, solar collectors too, is the small percentage of the season in which the maximum design capacity is really needed. The use of large-size, high-first-cost equipment to satisfy these short-term maximum heating requirements does not appear to be practical.

The AG&E is planning to construct a house of its own in which a solar heat pump system will be incorporated. It is conceivable that in this house the collector will serve as a part of the roof or wall structure without detracting from its architectural appearance.

THESE PROJECTS are just the beginning of what is expected to be an expanding program of research in the field of solar space heating. As Dr. Maria Telkes of New York University said, "The problem of the sun-heated house cannot be solved by one or two experimental houses. But each new house is another experimental stepping stone toward the use of the sun as a fuel resource."

Already there are other projects in the planning stages. A house is to be

built in Salt Lake City by T. K. Collins which will have a glass roof and a parabolic (concentrating-type) collector. The Massachusetts Institute of Technology is planning to follow its still operating Solar House with another solar-heated house which will have the following objectives: It will be (1) livable and architecturally interesting, (2) of a size suitable for a wide market, (3) well insulated, in order to conserve thermal energy inputs, (4) of a shape and

form which will present a nearly minimum heat loss envelope per contained volume. A flat plate collector system, with sensible heat storage in water, will be designed to conform to a predetermined economic optimum size.

Heat distribution will be forced warm air. In this northern latitude an auxiliary oil-fired hot-water boiler will be installed for use when the solar system is unable to maintain comfort conditions.

POWER AND HEAT TO SUIT CAMPUS-PLAN SCHOOL

A case study of advanced engineering techniques

John Jay Junior-Senior High School
Katonah-Lewisboro District, N. Y.

Ketchum, Giná & Sharp, Architects
Tectonic Associates, Consulting Engineers

ENGINEERING solutions for school electrical and mechanical systems are now meeting the rapid advances in overall school planning. This is especially evident in the John Jay Junior-Senior High School where these systems have been tailored to suit the campus-type arrangement of buildings.

The dispersal of the buildings would have posed a serious problem of voltage drop in the electrical feeders had they been connected to a conventional 120/208-v supply. To reduce this effect, the engineers decided upon 277/480-v high voltage distribution, with heating and ventilating fan motors powered at 440 v and fluorescent lighting operating at 277 v. Long used in industrial buildings, and more recently in office buildings, high voltage has just begun to find application in schools, particularly where there are long wiring runs, and where lighting and motors over $\frac{1}{2}$ hp comprise a large proportion of the electrical load. Perhaps savings within the buildings at John Jay may not reach maximum potential because of the fairly large amount of 120/240 v load in electric hand dryers, stage lighting and kitchen ranges; however, the principal problem here was voltage drop in feeders, and that was successfully solved through use of high voltage and central location for large transformers. Small transformers furnishing 120/240 v are installed generally in the fan rooms of the various buildings.

In the heating and ventilating system the engineers have exploited some recent trends — such as packaged, factory assembled equipment; thermostatically- and clock-controlled perimeter warm air heating; and hot water radiant panel heating — to turn out a well integrated design of wide flexibility and low cost. Large-size unit ventilators up to 8000 cfm capacity (at 70F) deliver temperature-controlled air through underfloor fiber ducts, embedded in the concrete slabs. By means of two-speed motors, the unit ventilators can operate on fast speed for (1) quick morning warm-up, (2) fast circulation of outside air when

cooling is needed, and (3) recirculating room air at night for maximum heating effect; or operate on the low speed to draw in only the required amount of fresh air so that fuel is not wasted.

ELECTRICAL SYSTEM

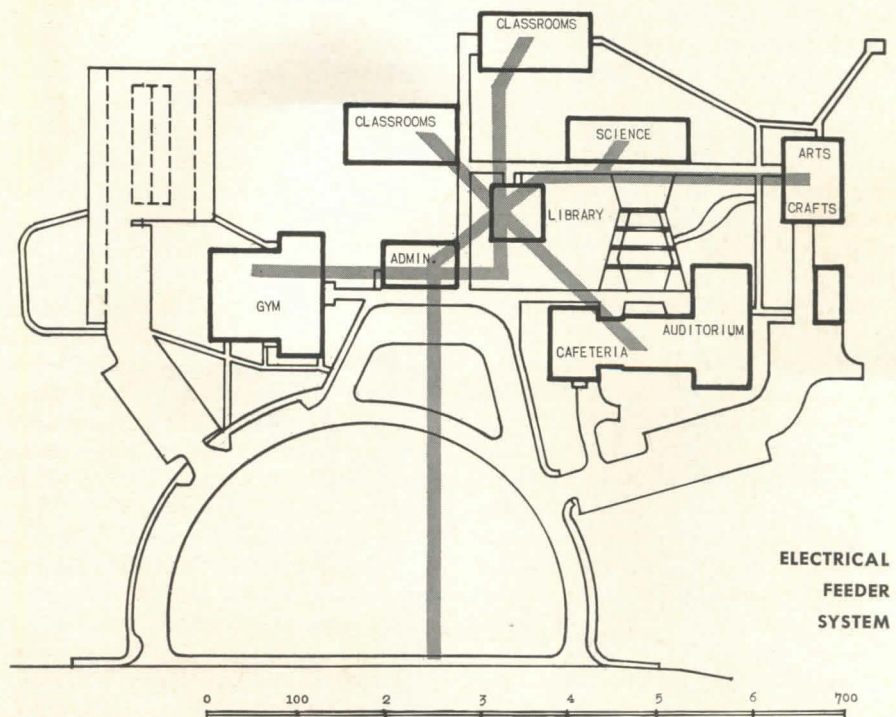
Voltage-drop could have been severe at 120/208 v since buildings were at various locations over an area approximately 330 by 730 ft. The way high voltage (277/480 v) works in cutting voltage drop is illustrated by this example: If a 75-ft length of No. 12 wire (the size used in homes) carries 20 amp of current at 120 v, the power carried by the conductor is 2400 watts, and the voltage drop in the wire is 2.3 per cent. If, however, the same 20 amp is carried through the same wire at 277 v, then the power is 5540 w, and the voltage drop is only 1 per cent. Savings are obtainable also through the lower thermal capacity requirement at higher voltage. The current in a high voltage system can be about half that of the current

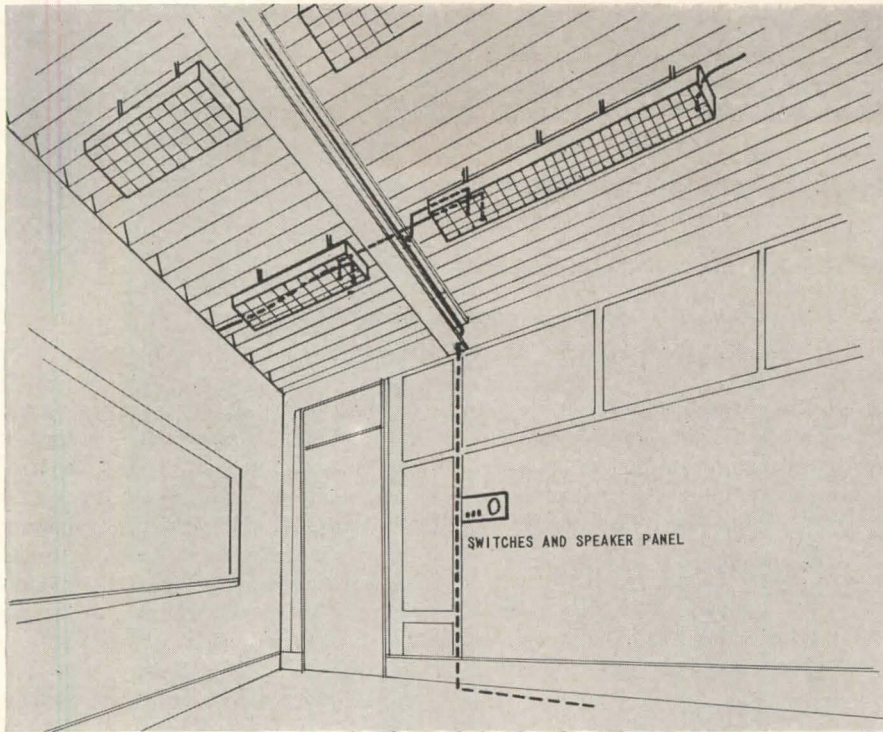
in a 120/208 v system for equal power, with the result that considerable savings can be made in feeder circuits, bus conductors, circuit breakers and motors.

As with 120/208 v, standard lighting fixtures, switches, circuit breakers, cable, etc., all approved by Underwriters' Laboratories and sanctioned for use by the National Board of Fire Underwriters, are available at 277/480 v.

The only difference between fluorescent fixtures for 277 and 120 v lies in the ballast, which means just a slight increase in cost. Most motors, except those with fractional horsepower ratings, are available at the same or lower cost for high voltage operation.

There are two disadvantages of the 277/480-v system: (1) fluorescent fixtures, as already mentioned, cost more; wall switches and some circuit breakers also cost more, but each device can handle more load; (2) all of the convenience outlets must be supplied with 120 v, and in addition, certain equipment, such as stage lighting, is available





HIGH VOLTAGE WIRING for classroom lighting (277 v) runs exposed along the beams and corrugated metal deck ceiling. It will be laid along the bottom flange of the beam (instead of top flange as shown) and can conveniently be concealed between ceiling corrugations. Since lighting forms a large proportion of the electrical load in any school, it is advantageous to use a high voltage system to save on wiring and to reduce voltage drop.

PERIMETER HEATING by means of fiber ducts in slabs has large-size, packaged unit ventilators for the heat source. Classrooms are divided into two heating zones. Return air is pulled through registers in corridor walls and brought back to the fan room by underfloor ducts from where it is wasted to the outside during the day and recirculated at night.

only at 120 v. To serve these loads, transformers must be supplied which provide a step down from 480 to 120 v. Fortunately these transformers are small, trouble-free, and not too expensive. Of course each building must have two circuit-breaker panel boards — one for the 277-v loads and one for the 120-v loads, but the total number of circuits will be the same or fewer than for the one large panel board required in each building for a 120/208-v system.

One factor that could be a problem in some cases is the requirement that no light fixture operating on 277 v be closer than 8 ft from the floor. But this did not present difficulties except for a few times, and then these were accommodated by the use of 110-v current which has to be used for baseboard receptacles anyway.

A rule of thumb for deciding whether or not to consider 277/480 high voltage is as follows: (1) the motor and fluorescent lighting load should be at least one-third to one half of the total load; or (2) the average main feeder length should be 200 ft or more. In the John Jay School, it was estimated that between 53 to 80 per cent of the load could be served at 277/480 v, depending whether or not electric cooking is used in the cafeteria. The average main feeder length is between 370 and 550 ft, depending on where the main power supply is brought in. Thus on both counts,

277/480 v supply should be considered.

Since there is equal safety and operability in the two systems of voltages, the final choice between them depends purely on economics. Based on the preliminary estimate of electrical loads, designs were set up for both voltages, and costs determined. Cost figures include only that equipment from the power company's transformers out to and including the panelboards. Any special equipment, such as the 480- to 120-v transformers, was included. The designs were laid out on two bases: one with the 4800- to 480-v transformers and the main service equipment located in the conventional spot — the boiler room, which is at the extreme north end of the property; the other with transformers and main service centrally located in or under the library. (Actually the transformer room is now located in the administration building adjacent to the library, and the "grounding transformer" — which was required because of the nature of the power company's service — is in the library. The grounding transformer was necessary to get a fourth wire from the three-wire, 480-v transformer which the power company furnishes as standard, and will cost approximately \$3000. The fourth wire makes it possible to get 277 v as well as 480 v.)

The costs, including labor, were estimated as follows:

Service Location	120/208 v	277/480 v
Boiler house	\$101,000	\$41,000
Library	54,000	32,000

HEATING AND VENTILATING

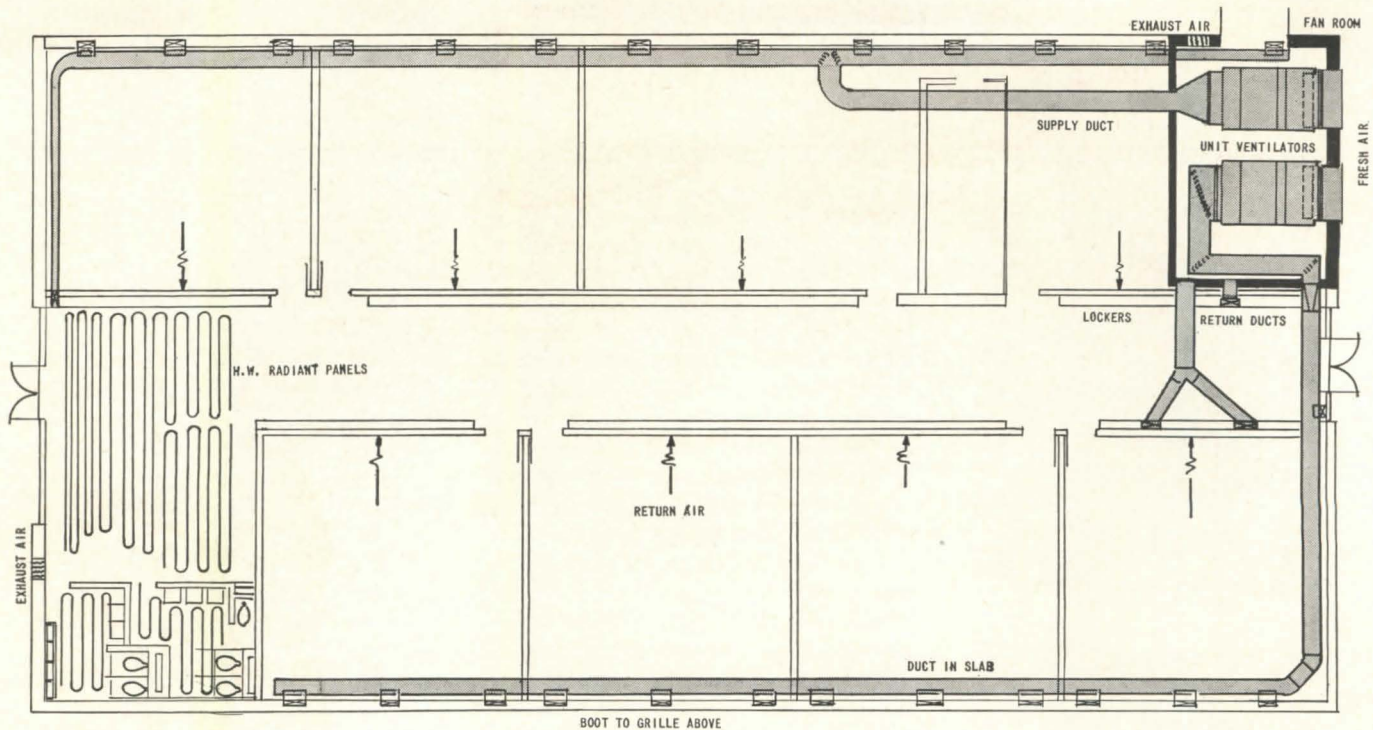
With the high school being comprised of eight separate buildings and boiler house, the engineers found it advantageous to design the heating and ventilating system around large-size unit ventilators, 18 in all. Units consist of a fan, heating coils, filters, and fresh air and recirculated air dampers.

Each building was divided into zones of like exposure, served by unit ventilators, with air being delivered to the space usually through underfloor ducts buried in the concrete slab at the outside edge of the rooms.

Supply air enters rooms through vaned slots at the outside wall which serves to warm the coldest surface in the room as well as to counteract window downdraft. Waste and return air is drawn from the classrooms through lockers lining the corridor wall into the corridor from which it is vented to outdoors in the daytime or returned to the heating and ventilating unit at night.

Basis for System Design

A minimum of 10 cfm of fresh air per pupil is recommended by the N. Y. State Department of Education. If this minimum requirement were taken as the sole basis for sizing ducts and fans, the



system would be handicapped in two respects: (1) supply air temperature would have to be quite high at times, if only 300 cfm of air were supplied to a 30-pupil classroom; for example, it would be 160 F for a 0 F outside air temperature; (2) there would be inadequate fan and duct capacity for room cooling with outside air in warm and moderately cool weather. Because of radiated heat from the sky and sun, as well as body heat from occupants and heat from lights, cooling is required even when air temperatures are as low as 40 F outside.

The engineer's problem, then, was to resolve the contradictory conditions of providing a lot of air when cooling is needed, yet introducing only the minimum required amount of fresh air during daytime heating periods to keep fuel cost down. The answer was to use two-speed motors for the unit ventilators and to size ducts so that at top fan speed, 900 cfm of air would be supplied to a 30-pupil classroom, providing sufficient cooling up to the point that outside air reaches 60 F. When heat is required during classroom occupancy, fan speeds drop down to 300 cfm, which is all that is required following the pre-school warming-up period.

This is how the system operates: During the warming-up period and school hours the fans operate continuously. Warm-up occurs at the high fan

speed (900 cfm), and with the unit ventilators set for 100 per cent recirculation of air. When the room air temperature reaches 72 F, the fan switches automatically to low speed (300 cfm) and 100 per cent outdoor air. Air temperature is maintained at 72-74 F by thermostatic control of the hot water supply valve to the unit ventilator. In classroom buildings, two thermostats are provided per zone, and their recordings are averaged for hot water control. The 300 cfm of air is sufficient for heating once the room is up to temperature because of the aid of sky radiation, sunshine and body heat. If the room air temperature continues to rise above 74 F after the hot water supply valve is completely shut, the fan switches to high speed in order to introduce the full 900 cfm of outside air for cooling. An over-riding control keeps supply air from ever going below 50 F. At night all fans operate intermittently on high speed for maximum heating effect and with full recirculation to maintain a 55 F room air temperature.

Special Systems

In the administration building, where ventilation is not as important as in classrooms, because of a lower concentration of people, baseboard convectors are employed, with four zones of temperature control being provided. The teachers' lounge is heated partially by a unit

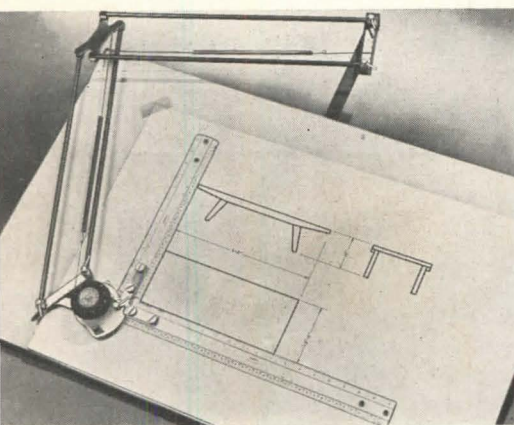
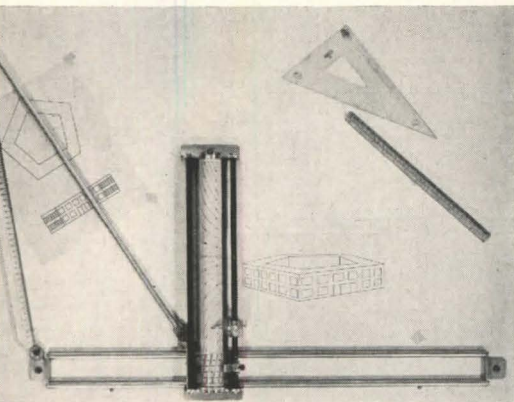
ventilator, operating on the day cycle only, and with a minimum fresh air setting of 60 per cent.

A special feature in the gymnasium is a heated and ventilated locker enclosure into which rolling racks are placed at night to dry gym clothes and control odors. Fresh air is induced by an exhaust fan into the locker room, over a series of fin-pipe heating coils, and up through the locker racks. Exhaust fans in the locker rooms are interlocked with the time clocks and operate only on the day cycle. The locker storage rack exhaust fans operate continuously, but the fresh air intake dampers are closed during the day cycle and open during the night cycle.

Hot water radiant panels heat the lobby and toilet rooms of the classroom buildings to insure plenty of warmth for these areas.

The auditorium has two unit ventilators, which vary in operation according to whether they are on the day or the night cycle and whether or not the auditorium is occupied. For the unoccupied day cycle, one unit runs on the standard day cycle and the second unit remains inoperative. For the unoccupied night cycle only one unit runs, operating on the standard night cycle. For occupied day or night cycles, a manual switch is used to operate both unit ventilators and to activate the exhaust fans and gravity exhaust dampers.

MECHANICAL DRAFTING EQUIPMENT SPEEDS DRAWING OF PERSPECTIVES AND PLANS



Perspective Drawings can now be made directly from plans and blueprints with the new *American Perspectograph*. All the time-consuming construction work formerly required in the creation of a perspective drawing, such as locating of vanishing points and drawing of construction lines, is eliminated.

This technical drawing instrument, the first American prototype of the French Perspectograph, is simply fastened to the drawing board by means of thumb tacks at both ends, as shown in the photograph top left. The orthographic drawing which is to be translated is taped to the drawing board at the angle from which the perspective is to be drawn. Then, by means of the calibrated sweep arm at the left and the cylinder chart of curves which runs on nylon rollers along the extruded aluminum tracks, points are transferred from the orthographic drawing to a perspective. For each point in the orthographic drawing, the cylinder is rolled until the hairline indicator at the base of the cylinder coincides with the number which corresponds to the point indicated on the sweep arm. The plastic pointer which travels up and down the cylinder is

moved until it touches the proper perspective curve, and then the draftsman marks the point by inserting his pencil through a hole on the outside of the pointer. The Perspectograph can work backward as well as forward, translating perspectographs into orthographics. *Perspectograph Corp., 285 Madison Ave., New York 17, N. Y.*

Professional Drafting Machine which combines the functions of T-square, triangle, protractor and all-purpose or architectural scales reduces the time required for drawing plans or scale drawings, general drafting and commercial artwork. The *Walpole-Nordquist drafting machine* (bottom left), a Swedish-made instrument now offered on the American market, sets and holds any angle and its complement. The protractor head reads from 90 deg through 0 to 45 deg, with automatic quick-set lock every 15 deg. The head can also be locked at any desired angle between the automatic 15-deg stops. The portable instrument is constructed of cold-drawn steel tubing and machined steel and plastic parts. *The Walpole Co., 419 Boylston St., Boston 16, Mass.*

OTHER DRAFTING AIDS: TEMPLATES FOR CIRCLES, FURNITURE, LANDSCAPES

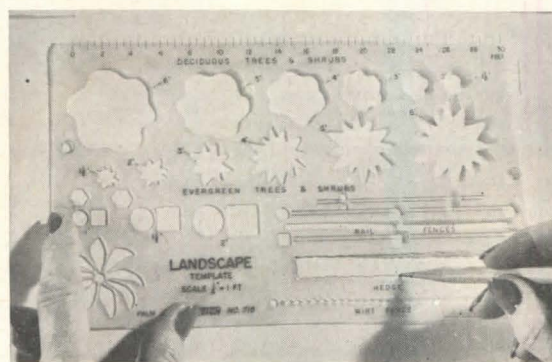
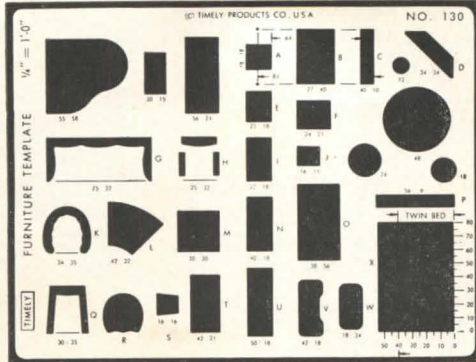
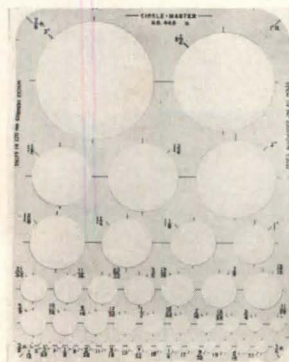
Circle Template. A template for drawing circles contains 44 precision-milled circles. The circles are grouped in progressive sizes on the *Circle-Master* with increments in 64ths, 32nds, 16ths, 8ths, 4ths and halves of an inch. All circles make allowance for pencil clearance of 1/32 in. The four corners of the template are precision-cut to give radii of 5/8-, 3/4-, 7/8- and 1-in. diameters. *Alvin & Co., Windsor, Conn.*

Furniture Template includes stampings scaled 1/4 in. to the foot that can be used for every common piece of furniture, including a grand piano. A smaller template, scaled 1/8 in. to the foot, is also available. *Timely Products Co., Route 256 West, Baltimore, Ohio.*

Landscaping Template. Nursery and planting sizes, from seedlings to saplings and upwards, are engraved into

this vinyl template in 1/4 in. to the foot scale. The standard symbols include those of deciduous and evergreen trees and shrubs, hedges, utility and decorative fencing. Scaled hexes, circles and squares will indicate drinking fountains, statuary, telephone poles, etc. A 1/4-in. scale covering 30 lin ft is included on the upper edge. *A. Lawrence Karp, 16 Putnam Park, Greenwich, Conn.*

(More Products on page 256)





Jay Maisel

BUCKY BUILDS AN ALL-PLASTIC DOME

Bucky Fuller has built another dome. This time it's a record-breaking 55-ft-diameter three-quarter sphere fabricated entirely of reinforced plastic, making it the world's largest rigid plastic structure.

The first test assembly, shown in these photographs, was bolted together last August on the grounds of Lunn Laminates Inc., fabricators of the plastic panels. A prototype of shelters to be used for military purposes, it was engineered by Geodesics, Inc., to withstand 200-mph wind stresses, arctic snow loads, extreme cold and heat and other hazards of extreme latitudes. The dome consists of 363 components in the form of diamond and circle "cakepans," the flanges of which are bolted together through pre-drilled holes.

One of the prime requisites for the structure was that it be a type which

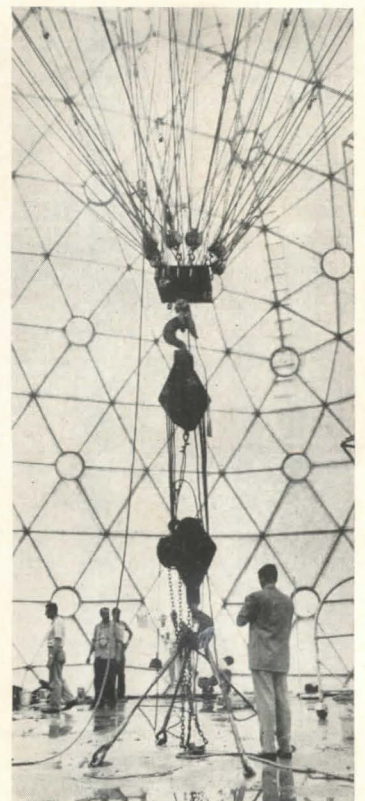
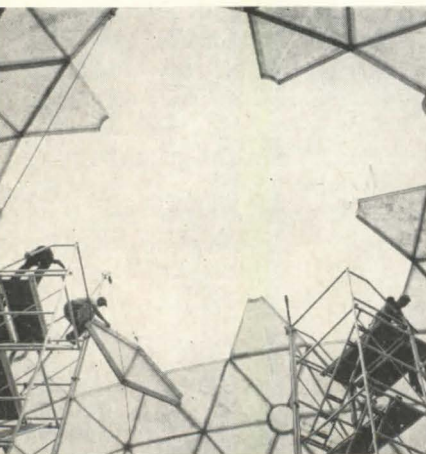
could be easily and speedily assembled under sub-zero weather conditions. The experimental assembly was completed in 288 man-hours by a crew of eight men, none of whom had ever seen a Geodesic structure. It has been calculated that subsequent assembly can be accomplished in less than 100 man-hours. Congruent edges of the diamond pans are color-coded in the molding process to simplify assembly.

The total weight of the dome is only 12,000 lb, or 6 tons. Height at the center is about 40 ft, and its clear span volume is equivalent to the combined volume of three large eight-room houses.

Walter O'Malley was so impressed by the dome—especially its strength, translucence and shatter resistance—that he is considering a geodesic structure as a park enclosure for the Brooklyn

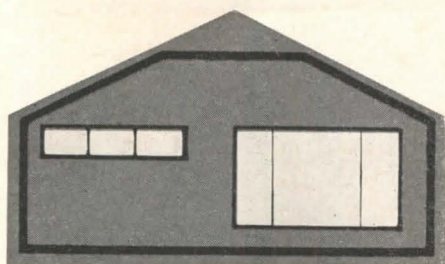
Dodgers. If it comes to fruition, its 700-ft diameter will indeed be a record-smasher!

In the field of military enclosures, the new plastic dome is not an innovation. The Marine Corps has traded its tents for geodesic "igloos," and expects to have all tents phased out of service by June 1958. Bucky's Marine Corps igloo consists of a self-supporting structural framework of lightweight metal from which is suspended a weatherproof, insulated cover of neoprene-coated synthetic fabric. Like other domes, it is simply produced and constructed, functionally suitable, strong and durable. Light enough to be transported by helicopter, cool in summer and warm in winter, it has been called the "first major basic improvement in mobile military shelter in the past 2600 years."



Apparatus used to test strength of dome is shown at right and above. Load, applied by tightening pulley ropes attached to the ribs, was increased to 20 tons without a sign of failure

Dome is entirely self-supporting, as shown at left in photos of outside and inside at the same stage of erection. Qualities of translucence, light weight and ease of handling are evident. Geometric forms are outlined by black gaskets, which were pre-formed as continuous diamonds and circles. When the gaskets were stretched around recessed edges of the plastic components, the pressure produced by bolting the ribs together caused them to mesh. (More Roundup on page 246)



INSULATING THE AIR-CONDITIONED HOME

Insulation design — for roof, walls and floors, and treatment of windows — is sketched in an informative booklet offering design principles for maximum year-round heat control in air-conditioned homes. Illustrated with sketches, photographs and charts, the 20-page booklet gives such useful suggestions as the installation of kitchen exhaust fans and proper orientation of the house location to reduce the amount of sun load on walls, roof and exposed windows. *Owens-Corning Fiberglas Corp., Toledo 1, Ohio.**

Office Furniture. An 18-page booklet describes and illustrates with photographs and detail drawings a line of office furniture that includes a coordinator group of interchangeable modular units. *Catalog No. 4, The Feldman-Seljé Corp., 910 E. 4th St., Los Angeles 13, Calif.*

Steel Kitchens. Custom-built steel kitchens are described and illustrated, with specifications and dimensions, in color in a 4-page booklet. *St. Charles Mfg. Co., St. Charles, Ill.**

Mortar Cement. A 24-page booklet on mortar cement includes sections on recommended practice covering materials, proportioning, mixing, laying of units and reference tables of useful data. *AIA File 3-A-9. Universal Atlas Cement Co., 100 Park Ave., New York 17, N. Y.**

Laminated Wood Beams. The use of unit glued, laminated wood is demonstrated with descriptions and plans of its use in an actual church. 4 pp., illus. *Unit Structures, Inc., Peshtigo, Wash.**

Lime Products. The manufacturing processes, applications and specifications of lime and lime products as applied to masonry, plastering and agriculture are described and illustrated in a 28-page reference manual. *Ohio Lime Co., P. O. Box 128, Woodville, Ohio.*

Concrete Masonry for walls in churches, offices and homes is described and illustrated with colored photographs in a 16-page booklet from *Portland Cement Assoc., 33 W. Grand Ave., Chicago 10, Ill.**

Freight Elevator. A 12-page brochure describes and illustrates with detail drawings and photographs the operation of Otis Plunger electric freight elevators. *AIA File 33C. Otis Elevator Co., 260 11th Ave., New York 1, N. Y.**

Metal Grating. A 16-page data and specification manual covers all types of grating, open steel floor armor, stair treads, vessel liners, bridge decking and drain grates. *Metal Grating Corp., 6605 S. Melvina Ave., Chicago 38, Ill.**

Movable Walls. A 4-page folder features a movable wall installation in the Edsel Ford Senior High School, showing floor plans and illustrations. *The Mills Co., 956 Wayside Rd., Cleveland 10, Ohio.**

Aluminum Shapes. A 16-page catalog contains cross-section drawings and descriptions of standard extruded aluminum shapes, including thresholds, sills and a sizable selection of hollows with sharp corners. *Jarl Extrusions, Inc., East Rochester, N. Y.*

Lift-slab Construction. An engineering manual, illustrated with detail drawings and photographs, gives design data on the *Youtz-Slick* method of lift-slab construction. \$5.00. *U. S. Lift Slab Corp., Perry Brooks Bldg., Austin, Tex.*

Visual Equipment. A 32-page booklet containing detail drawings, charts and specifications lists equipment necessary for visual aids for teaching in class and conference rooms. *Bell & Howell, 7100 McCormick Rd., Chicago 45, Ill.*

Furnace Pipe and Fittings. A 26-page catalog contains photographs and charts describing standardized furnace pipe and fittings and prefabricated ducts and fittings. *Corbman Bros., Inc., 25th and York Sts., Philadelphia 32, Pa.*

Granite. The applications of granite as a structural and ornamental stone for schools is the subject of a brochure which lists advantages, costs, colors, sizes, finishes and delivery. *Dept. KP, Cold Spring Granite Co., Cold Spring, Minn.**

Emergency Lighting Equipment is described in an 8-page catalog containing diagrams, charts and specifications. *Exide Industrial Div., The Electric Storage Battery Co., Box 8109, Philadelphia 1, Pa.*

Steel Doors. An 8-page catalog details basic specifications for steel interior doors and frames. *Steel Door Institute, 2130 Keith Bldg., Cleveland 15, Ohio.*

Lighted Signs. Specifications and illustrations are given in a 12-page catalog on unit construction for lighted signs. *AIA File 31-F2. The Perfectite Co., 1457 E. 40th St., Cleveland 3, Ohio.*

Furniture. An attractive, hard-bound catalog contains 72 pages of photographs, illustrations and specifications of contemporary furniture including tables, chairs, desks and sofas for homes, offices and institutions. *Jens Risom Design, Inc., 49 E. 53rd St., New York 22.*

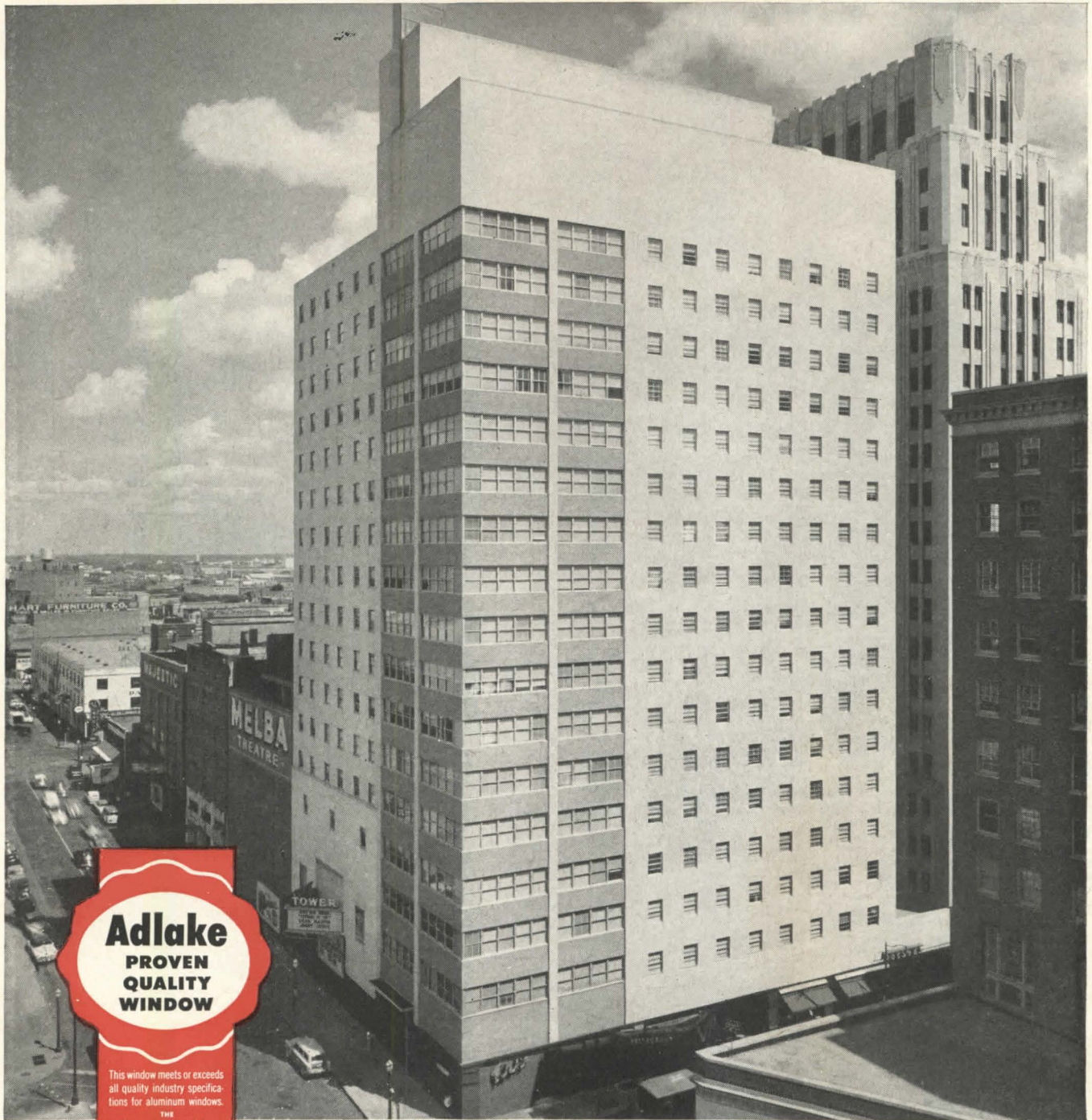
Drafting Room Furniture. A 16-page illustrated catalog provides a reference to selection and purchasing of tracing storage files, drafting tables, draftsman's stools and upholstered chairs. *Frederick Post Co., 3650 N. Avondale Ave., Chicago 18, Ill.*

Porcelain-on-Aluminum Tile. Actual samples showing weight and colors of porcelain-on-aluminum tiles are included in an 8-page booklet which describes the tiles and gives specifications. *Vikon Tile Corp., Washington, N. J.**

Long Span Q-Deck. Load tables, structural details and specifications are given in an 8-page booklet on long span Q-decks. *H. H. Robertson Co., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.**

** Other product information in Sweet's Architectural File, 1955.*

(Continued on page 304)



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tions for aluminum windows.

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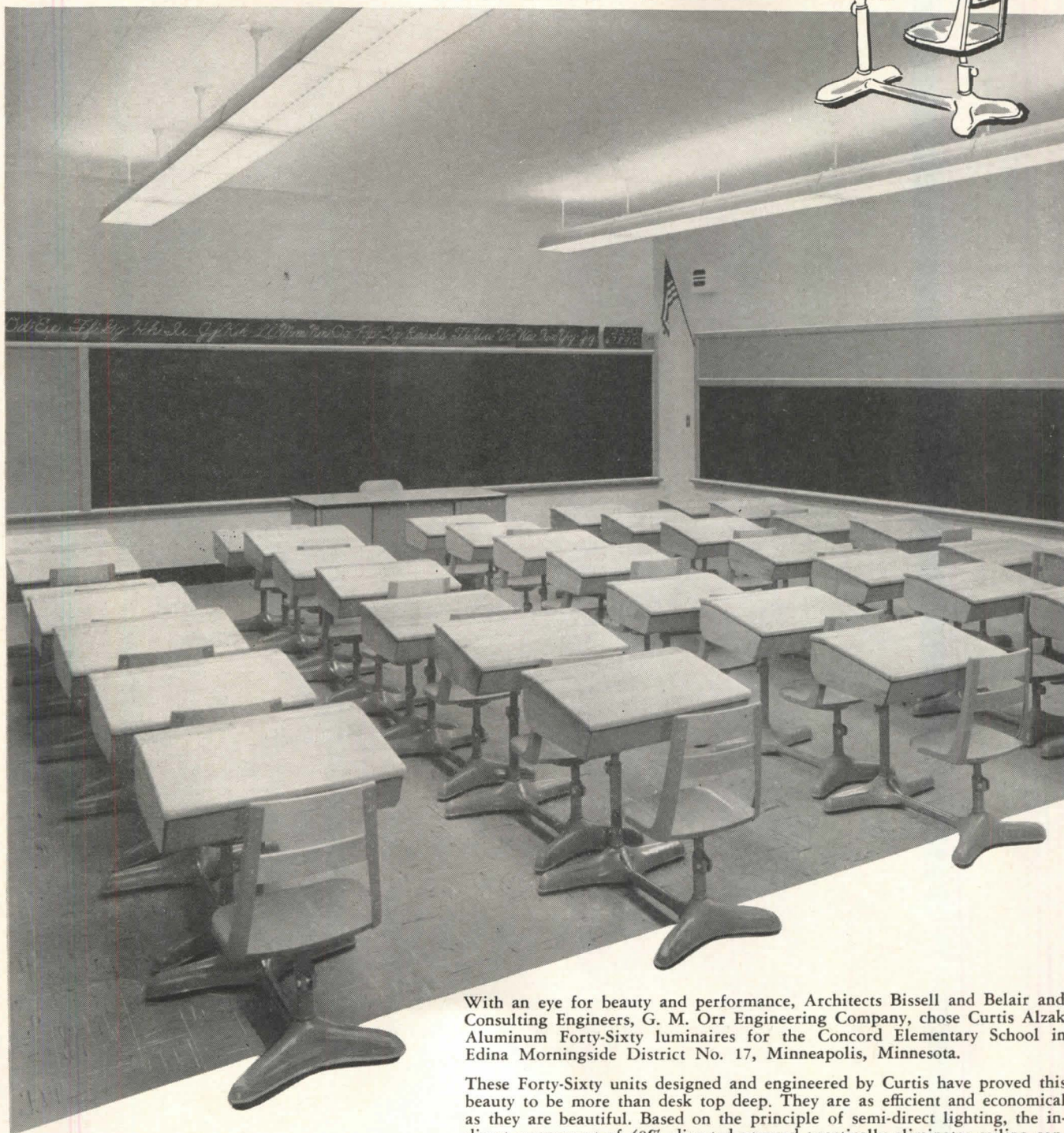
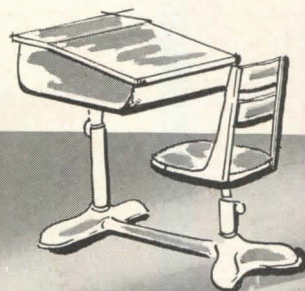


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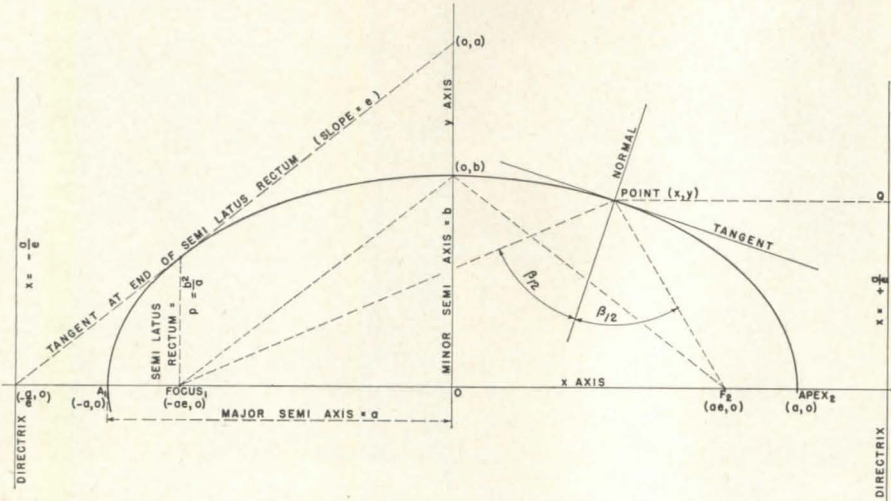
Curtis Lighting of Canada, Ltd.
195 Wickstead Ave.

Leaside, Toronto 17, Ont., Canada

USEFUL CURVES AND CURVED SURFACES: 4 — Ellipse

By SEYMOUR HOWARD

Assistant Professor, Pratt Institute, Architect associated with Huson Jackson and Harold Edelman



Note from characteristics of tangent (see diagram) that a line from a focus (a ray, for example) will be reflected by the ellipse and will pass through the other focus.

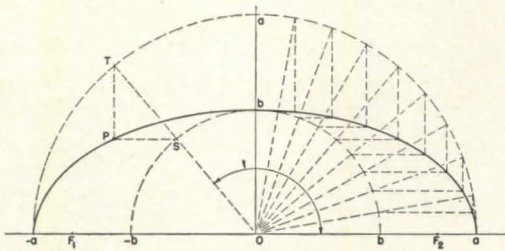
STANDARD FORM

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad (b \text{ always less than } a, \text{ except for circle when } a = b)$$

Definition I: $\frac{\text{Distance of Any Point to Focus}}{\text{Distance of Point to Directrix}} = \frac{PF}{PQ} = \text{Constant} = \text{Eccentricity } (e) = \sqrt{1 - \frac{b^2}{a^2}} = \text{Less Than } 1$

Definition II: $\text{Distance of Any Point to Focus}_1 + \text{Distance from Point to Focus}_2 = PF_1 + PF_2 = \text{Constant} = 2a$

To Draw: (String Method) Find foci by swinging arc = a from end of minor semi axis; insert pins at foci and at end of minor semi axis; tie string around three pins; replace pin on minor axis by pencil; slide pencil against string, keeping string taut. The larger the ellipse, the better this method is (smallest practical size, major axis = 12 in.) It can easily be used for full size layout. For smaller ellipses, use method based on parametric equation.

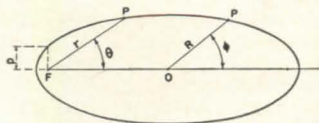


PARAMETRIC FORM

$$x = a \cos t$$

$$y = b \sin t$$

To Draw: Draw one circle with radius = a and one with radius = b, centers at O; from O draw any straight line, intersecting circle of radius b at S and circle of radius a at T; draw line through S parallel to x axis and a line through T parallel to y axis; the intersection of these lines is a point on the ellipse.



POLAR FORM

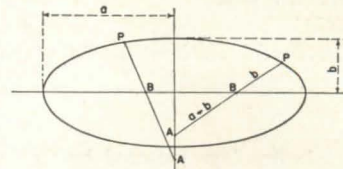
Pole at focus: $r = \frac{P}{1 - e \cos \theta}$

Pole at intersection of axes:

$$R^2 = \frac{a^2 b^2}{a^2 \sin^2 \phi + b^2 \cos^2 \phi}$$

$$P = \frac{b^2}{a} \text{ (semi-latus rectum)}$$

For the circle these equations become
 $r = R = a = b$



TRAMMEL METHOD

Make a stick (or piece of paper) of length PA = a; mark off PB = b, slide point A along minor axis and point B along major axis, point P will describe ellipse

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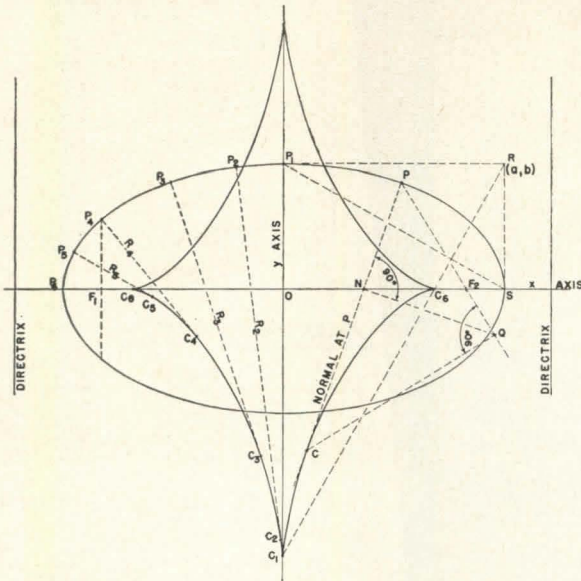
City _____ Zone _____ State _____

AR-2

USEFUL CURVES AND CURVED SURFACES: 5— Ellipse

By SEYMOUR HOWARD

Assistant Professor, Pratt Institute, Architect associated with Huson Jackson and Harold Edelman



EVOLUTE OF ELLIPSE

The evolute can be used to visualize the curvature of the ellipse and to aid in constructing a curve parallel to the ellipse. (For example the intrados and extrados of an arch of uniform thickness whose centerline is an ellipse.) Such curves, called parallels to the ellipse, are not ellipses.

To find center of curvature for any point P: draw normal through P; from intersection N with major axis, erect perpendicular intersecting PF₂ extended at Q; from Q erect perpendicular to PQ intersecting normal PN extended at C. C is center of curvature, CP is radius of curvature.

Radius of Curvature

$$R = a^2 b^2 \left(\frac{x^2}{a^4} + \frac{y^2}{b^4} \right)^{3/2}$$

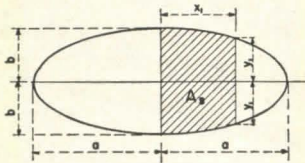
for any point x, y on the ellipse

To find points C₁ and C₆ on the evolute (see right hand half of curve): from point R drop perpendicular to line P₁ S; this cuts major axis at C₆, minor axis extended at C₁.

$$\text{Radius } C_6 P_6 = \frac{b^2}{a} = p \quad \text{Radius } C_1 P_1 = \frac{a^2}{b}$$

Equation of Evolute (Standard form)

$$a^{2/3} x^{2/3} + b^{2/3} y^{2/3} = (a^3 - b^3)^{2/3}$$



LENGTH OF ELLIPSE

Total Length

$$L = \pi [a+b] \left[1 + \frac{1}{4} \left(\frac{a-b}{a+b} \right)^2 + \frac{1}{64} \left(\frac{a-b}{a+b} \right)^4 + \frac{1}{256} \left(\frac{a-b}{a+b} \right)^6 + \dots \right]$$

For lengths of arcs of ellipse, see the following publications: Smithsonian Mathematical Formulas and Tables of Elliptic Functions (Smithsonian Publ. No. 2672) Smithsonian Elliptic Functions Tables (Smithsonian Publication No. 3863).

AREAS

Total area bounded by ellipse = A = π a b

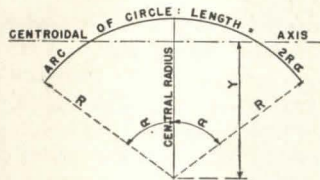
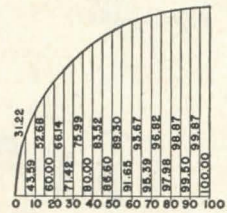
Area of segment bounded by ellipse, axis and line x = x₁ (as shaded) A₈ =

$$x_1 y_1 + ab \arcsin \frac{x_1}{a}$$

Note that these equations hold true for a circle, when a = b = r and the eccentricity is zero.

ORDINATES of Quadrant of Circle. To find corresponding ordinates of quadrant of an ellipse, multiply each ordinate as figured

for circle by the ratio $\frac{b}{a}$



CENTROIDAL AXIS

For an arc of a circle the distance of the centroidal axis (normal to the central radius) from the center of the circle is:

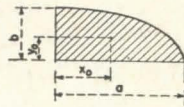
$$Y = \frac{R \sin \alpha}{\alpha} \quad (\alpha \text{ in radians})$$

The "moment of inertia" of this arc about the centroid =

$$I = R^3 \left[\alpha + \frac{1}{2} \sin 2\alpha - \frac{2 \sin^2 \alpha}{\alpha} \right]$$

α in radians

Unfortunately there is no simple equation for finding the centroidal axis for an arc of an ellipse.



CENTROID

("Center of Gravity") of quadrant bounded by ellipse and

two semi axes (Area = $\frac{\pi ab}{4}$)

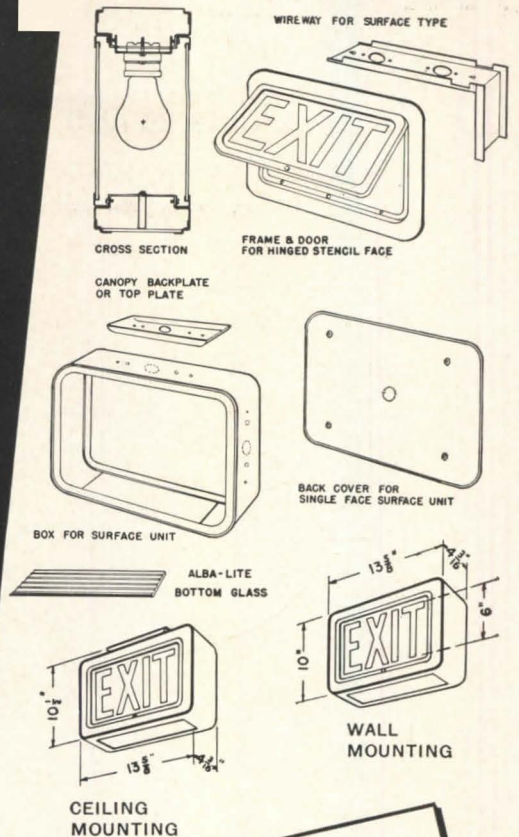
$$x_0 = \frac{4}{3\pi} a = 0.4244 a$$

$$y_0 = \frac{4}{3\pi} b = 0.4244 b$$



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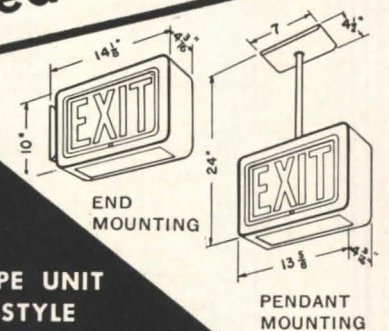
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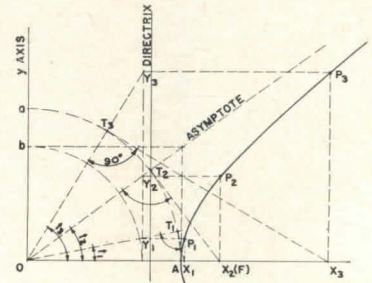
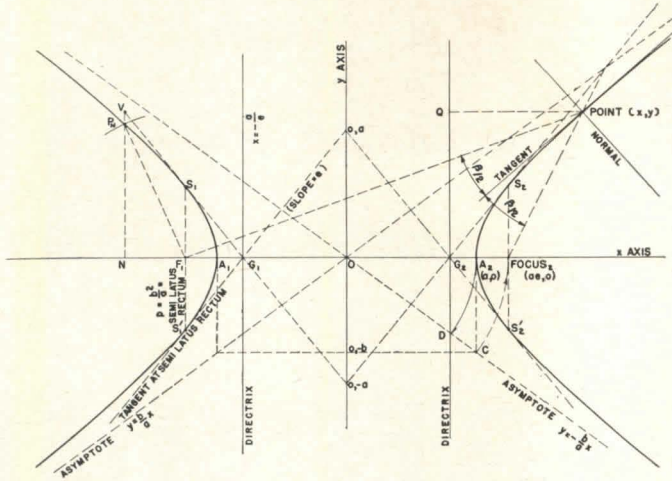
NAME.....
ADDRESS.....
CITY.....STATE.....



USEFUL CURVES AND CURVED SURFACES: 6—Hyperbola

By SEYMOUR HOWARD

Assistant Professor, Pratt Institute, Architect associated with Huson Jackson and Harold Edelman



PARAMETRIC FORM

$$x = a \sec t = \frac{a}{\cos t}$$

$$y = b \tan t$$

(only one quadrant shown)

To Draw: Draw circles with radii = a and = b, centers O. From O draw any line, intersecting circle of radius a at T. From T erect perpendicular (tangent to circle) intersecting x axis at X. From intersection of circle of radius b with x axis, erect perpendicular intersecting OT at Y. Through Y draw line parallel to x axis, which will intersect a line parallel to y axis drawn through X at P. P is a point on the hyperbola.

Note that tangent to circle of radius a at intersection with asymptote passes through focus.

STANDARD FORM

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \quad \text{Asymptotes (tangents at infinity)} \quad \begin{cases} \frac{x}{a} - \frac{y}{b} = 0 \\ \frac{x}{a} + \frac{y}{b} = 0 \end{cases}$$

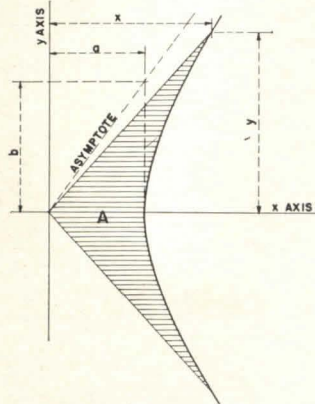
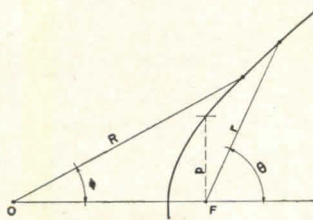
Note that b may be greater than a; in that case the curve is flatter. When a = b, asymptotes are at right angles to each other (called a rectangular hyperbola).

Definition I: $\frac{\text{Distance of any Point to Focus}}{\text{Distance of Point to Directrix}} =$

$$\frac{PF}{PQ} = \text{Constant} = \text{Eccentricity } (e) = \sqrt{1 + \frac{b^2}{a^2}} = \text{Greater Than 1}$$

Definition II: $\text{Distance of Any Point to Focus}_1 - \text{Distance of Point to Focus}_2 = PF_1 - PF_2 = \text{Constant} = 2a$

To Draw: Given a and b, draw asymptotes. Apex is at a or -a on x axis. Find directrix by swinging arc = Oa to intersect asymptote at D (see lower right quadrant). Find focus by swinging arc OC to intersect x axis at F (OC = $\sqrt{a^2 + b^2} = ae$). Erect perpendicular through F. From points O, a and O, -a, draw lines through G₁ and G₂ and intersecting perpendiculars through F₁ and F₂ at S₁, S'₁, S₂, S'₂. To find any point on hyperbola (P_n, upper left quadrant), erect perpendicular at N to intersect G₁ S₁ at V. From F₁ swing an arc = NV to intersect NV at P_n.



POLAR FORM

Pole at focus

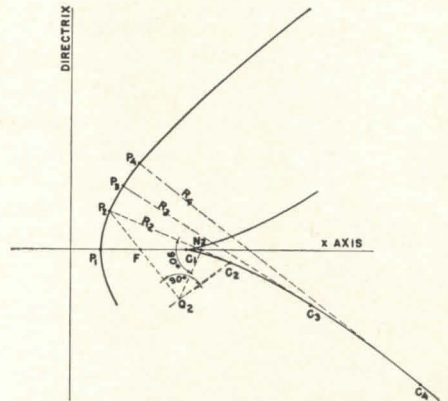
$$r = \frac{p}{1 - e \cos \theta}$$

Pole at center O

$$R^2 = \frac{a^2 b^2}{b^2 \cos^2 \phi - a^2 \sin^2 \phi}$$

AREA

$$A = ab \log_e \left(\frac{x}{a} + \frac{y}{b} \right) = ab \sinh^{-1} \frac{y}{b} = ab \cosh^{-1} \frac{x}{a} = ab \tanh^{-1} \frac{ay}{bx}$$



EVOLUTE OF HYPERBOLA

(For part of one quadrant)

Radius of Curvature

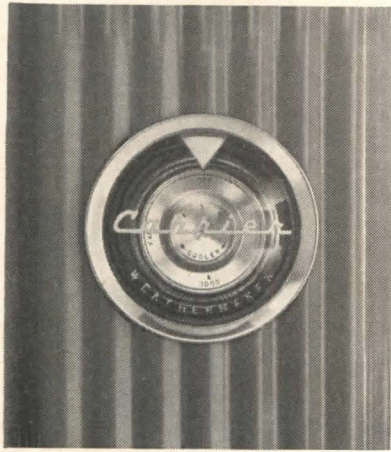
$$R = a^2 b^2 \left(\frac{x^2}{a^4} + \frac{y^2}{b^4} \right)^{3/2} \quad \text{For any point } x, y \text{ on the hyperbola.}$$

At apex (P₁), Radius C₁ P₁ = $\frac{b^2}{a} = p$

Equation of Evolute

Standard form: $a^{2/3} x^{2/3} + b^{2/3} y^{2/3} = (a^2 + b^2)^{2/3}$

Center of curvature of hyperbola can be found by same procedure as shown for ellipse.

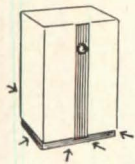


New Golden Aerodial. It's 22-karat gold-plated and beautiful... the focal point and control center of the new Weathermaker. Lucite dome hinges over main control, thermostat knob and reset button.

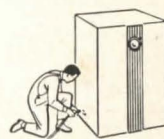
*the all-new, all-around
air conditioner
designed for lower
installation costs!*

NEW CARRIER WEATHERMAKER

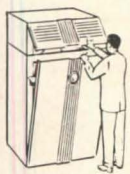
Here's the first self-contained air conditioner that you can apply to a variety of plans without increasing installation costs. Check these exclusive new features designed for fast, neat, low-cost installation:



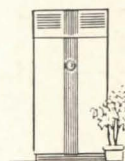
ADAPTABLE five-way air return. Where plan calls for ductwork, air returns through bottom or back of unit. Or matching return air intake base can be added so air returns at front or sides.



PRE-WIRED electrical center. Unit is pre-wired at the factory. All connections are made in one outlet box on left side of unit. Accessories can be wired to special terminal block eliminating complicated internal electrical work.



EXCLUSIVE solid front panel. No return air openings mar its appearance. You can locate furniture directly in front of unit without danger of dirt or drafts. Snap locks release panel.



EXTRA-LARGE add-on plenum. Matching plenum is easily mounted for installations not requiring ductwork. Hinged grille panel is counterbalanced for easy access. Full directional control of air flow.



ALTERNATE fan discharge. L-shaped fan platform easily inverted for rear discharge where headroom is low. This saves costly alteration of the cabinet. Saves space and ductwork, too.



BUILT-IN PROVISION for heating coil. Unit need not be altered to add matching heating coil inside the unit. Coils use steam or hot water to heat same area cooled by unit. Can be thermostatically controlled.