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Recent Trends in Library Architecture

Librarian Roden Traces Progress through Experience and Time

"The public library is one of the most highly developed types of buildings to be found in American architectural practice. By careful study of the problems it presents, primarily by librarians and secondarily by architects, its requirements and the best means for meeting them have been more completely worked out and standardized than those of any other type of edifice except the modern office building. Taken as a whole, the libraries of the United States, large and small, represent American architecture well-nigh at its best."

These words form the opening paragraph of a chapter on the Essentials of Library Planning in a useful and well illustrated manual issued in 1915 by Snead and Company, one of the leading manufacturers of library bookstacks. Their author was A. D. F. Hamlin, late professor of the history of architecture at Columbia, and at that time consultant to the building committee of the Brooklyn Public Library. The chapter embodies a summary of his observations resulting from a study of library architecture, both American and European, made for the Brooklyn committee, and contains many counsels and conclusions still sound and practical. It contains, also, a definition of libraries as "devices for bringing books and readers together," about as shrewd and pregnant a characterization of these institutions as was ever formulated.

But the Brooklyn building on which Dr. Hamlin collaborated was never built, and is only now, after many postponements, once again approaching the construction stage, under new architects and with new plans which show considerable variation from the monumental project developed nearly thirty years ago. Sketches thus far available indicate not only a new and appropriately modern rendering of the exterior, but even more interesting changes in the arrangement and allocation of interior spaces, and these changes would doubtless have been still more radical but for the hampering compulsion imposed upon the architects of utilizing in part the old foundations, laid in Prospect Park some time before 1910.

Significant of the progress made in library planning since Dr. Hamlin wrote are the elimination of the lofty flight of external steps, as well as of the "grand staircase" within, the establishment of the library's main activities on the ground floor, and a considerable shortening of the space to be traversed from the front door to the rooms where books and readers are to be brought together—all features of a new approach to those problems, which, in his view, had been largely solved and standardized in 1915. The truth is that the library plan, particularly that of the public library, is, happily, far from standardization — farther now than it was a quarter century ago—and that it will scarcely reach that definite state so long as the functions and objectives of the public library continue to expand and librarians retain the enterprise to develop new service ideals and the ingenuity to realize them.

Meanwhile the current trend in library planning and its development to date are exemplified in four public library buildings — Cleveland, Los Angeles, Baltimore and Rochester, N. Y. — all built within the past ten or a dozen years, and each representing the progressive development and application of a group of ideas that sets it apart from its predecessors. The most effective presentation of these developments would be by means of floor plans and photographs, but since such visual aids are not adaptable to these pages, the present—non-professional—contributor has rashly attempted to convey some notion of the situation in this hasty survey, compiled without benefit of a professional vocabulary and manifestly far short of an adequate treatment of his subject.

In brief, the new library plan may be characterized as the embodiment of a conscious effort on the part of librarians to abandon the traditional conception of the public library as an "institution," which must be housed in a building monumental in outline but which, too often, proves to be overwhelming rather than impressive, forbidding than inviting, in effect. Secondly, the present-day librarian knows, or thinks he knows, that the shortest distance and the straightest line between the reader, once he has passed the library portals, and the books provided for his use are ends to be achieved at all costs—even at the cost of majestic stairways and approaches without, and dazzling corridors and bewildering angles within.

Imbued with such aspirations, those of our colleagues to whom has recently been accorded the rare privilege of planning a new library building have sought to give expression in the buildings themselves to that spirit of service and of expansive hospitality which animates their institutions; to bring the library and its wares to the attention of the citizen first of all through the inviting and friendly aspects of facade, entrance, and windows, and thus to enlist these architectural elements in its never-ending campaign for the abatement of those hazards, both mental and physical, that seem still to intervene between it and a large part of the public that it seeks to serve. And within the walls the same inviting effect is sought and largely achieved by the disposal of the principal rooms in the most prominent locations, wherever possible on the street level floor, directly accessible as soon as one enters the building. The public library has come out into the open and, in coming into the open, has gone a long way toward coming into its own.

The first of the four buildings mentioned as illustrating the new direction is that of the Cleveland Public Library, completed in 1925. Designed as a unit in a civic center plan, the Cleveland building conforms in general to the pattern of the group and is perhaps less typical of the modern library plan than its successors. Internally, however, it sets the pace in the new direction by introducing the so-called departmental system under which, in place of a large central circulation hall and central reading room where books of all classes are issued, the contents of the library are divided among a series of connected rooms around the perimeter of the building, each devoted to a single literary class or group of allied classes, and each containing all of the essential books in its class. An inner belt of small stack rooms, lighted from a central court, is installed immediately adjacent to, and accessible from, these rooms, and takes the place of the huge bookstacks of the older libraries in which all of the books are shelved and from which they must be drawn by requisition and delivered by messenger.

In Los Angeles, erected in 1926, the architect was instructed that the building must "express warmth, hospitality, attractiveness and invitation," a combination that was more or less completely realized in the picturesque composition in concrete and stucco, the general architectural character of which, as explained by the architect himself, "cannot be classified at this time." Here, too, the departmental plan was adopted, with some modifications imposed by the irregular contour of the building, but, on the whole, with less practical success and without the effect of simplicity and cohesion apparent in the severely rectangular Cleveland structure.

The most distinguished exemplar of the modern library plan, and one that will not soon be surpassed, is the beautiful Enoch Pratt Free Library of Baltimore, opened in 1932, whose suave lines, dignified facade, block-long row of beckoning windows and beautiful portal are eloquent with gracious hospitality. The building is entered on its main service floor at sidewalk level. The same spirit of welcome and good will pervades the interior, which comprises a great central hall surrounded by the public rooms, each devoted to a single field of knowledge, but, unlike Cleveland and Los Angeles, all open and directly visible from the central hall which is in effect a spacious lobby rising to a two-story height and surmounted by a decorative skylight. Twelve large windows at pedestrian level not only transmit an abundance of daylight but serve in their lower sections for window displays in the mercantile manner, definitely planned to demonstrate the relation of books to every community interest. The only evidence of formality and control is in the two service desks for the performance of the necessary but simple routines incidental to the lending of books, and these desks are discreetly placed on either side of the entrance where they meet the visitor's eye only as he turns to leave the building.

The new Rochester public library, completed in 1936, pays to Baltimore in generous measure that tribute which is known as the sincerest form of flattery, particularly in its interior which comprises the sky-lighted central hall with open subject-departments ranged around it. Externally, however, the Rochester building presents a somewhat sterner front and more of those "institutional" aspects that the new trend seeks so sedulously to avoid. In both Baltimore and Rochester, ample storage stacks are provided in basements directly beneath the main floor with access from the several departments.

Thus it appears that some, if not much, water has passed under the bridge that spans the small stream called Library Architecture, since Prof. Hamlin wrote in 1915. It is a small stream, indeed, and one that few in the architectural profession have found it either interesting or profitable to turn to for the occasional flotsam borne on its feeble current. But it is still a flowing stream, in no immediate danger of disappearing altogether into the ground, and one which contrives, now and again, to cut out new channels for itself leading into new and virgin fields. To speculate upon the future course of its meanderings is a favorite pastime of librarians, and since, as we read with some satisfaction in Dr. Hamlin's opening paragraph, such progress as has been made in working out the problems of library architecture is due "primarily to librarians and secondarily to architects," it would seem that their speculations had been carried on to some purpose and should be continued, if only to postpone the day when the "last word" on library building and the function of the public library shall be spoken.

As one more speculation the following is, therefore, submitted, namely, that the next turn in the tide will be toward smaller library buildings with less space for the storage of books, and that the public library of the future will gradually give over the policy to which, since time immemorial, it has been committed, of zealously hoarding great numbers of books that have no longer a bearing upon the wants of its patrons or are of such infrequent use as to entail a cost in space and care out of all ratio to their intrinsic worth. For such books a central storehouse will be provided, probably to serve a wide area, whence they may be withdrawn with reasonable expedition in the rare event of their need, and to which they may be as expeditiously returned.

This is not a new notion. The memory still lingers of a similar proposal at a library conference some thirty years ago, and the shrill screams of protest with which it was greeted. But the fact that all the books worth keeping in all the world can still with ease be counted in six figures —and probably in five—will one day work its way into library administration, and the librarian of the future, when his time comes to build a new library, will resolutely protect himself against his occupational vice of book hoarding by omitting or greatly reducing the conventional "storage stack" with a capacity in astronomical figures, and will, with book collections kept well balanced and alive through rigid and continuous weeding, succeed in amply serving, at much lower cost of time and money, space and peace of mind, the most exacting and inclusive wants of his constituency. This, as has been said, is not a new notion, and was properly scorned in its time. But it has latterly been advanced again by some of our forward-looking colleagues and is likely to meet with increasingly favorable consideration.

—*Carl B. Roden.*

Landis Award Employers

Chicago stands sixth on the list of American cities in point of money volume in building for 1937. To insure a decided improvement in the new year and recognizing that high costs are retarding the recovery of the city's building industry, many thousands of unemployed building mechanics—both union and open shop—are anxiously seeking to work at their trades on a reasonable wage basis, says the Landis Award Employers' Association. These thousands of building tradesmen, all members of the Landis Award Employers' Association, including all of the principal building trades—bricklayers, plumbers, electricians, and carpenters — stand ready to go to work at $1 an hour, a figure approximately 33% to 43% lower than the official union scales.

Landis Award principles were promulgated sixteen years ago when construction activities were not at as low a level as they are at present Three important principles established by the Landis Award serve to counteract the high cost factor now considered an almost insurmountable obstacle to building revival. These principles are: 1. There shall be no restriction of output. 2. There shall be no restriction as to the use of machinery, methods or appliances. 3. There shall be no restriction against any raw material or manufactured material except prison made.

For a list of Landis Award contractors apply to Charles P. Peirce, Executive Vice President, Landis Award Employers' Association, 189 W. Madison St., Chicago.

Amalgamation or What?

Shall there be one national architectural society with branches or chapters and a number of independent state societies or associations? or,

Shall there be two national organizations with branches in many states? or,

Shall there be one national organization with branches and several independent state associations affiliated in some manner with the national organization? or,

Shall there be but one strong national organization with a branch or branches in every state?

The 1937 convention of the A. I. A. directed the appointment of a Committee on State Organization consisting of representatives of the Institute and the several state societies or associations. John R. Fugard of Chicago is Chairman.

This action by the convention is the culmination of efforts by the Institute and state associations through years to find a plan for unifying or consolidating the profession.

The Committee on State Organization has received a number of suggested solutions. These are in general agreement on some of the reasons for unrest and the problems confronting the profession. They can be briefly stated to be, according to these suggestions: Competition on the part of the Federal Government and unprofessional sources; "waning popularity" of the profession; unethical practice of members of the profession; and general dearth of business due to the above reasons and to the lack of appreciation of the value of professional architectural service.

The cure for these ills is said to lie in aggressive action through organized effort.

The aggressive action proposed should be affected through salaried officers devoting their efforts to advancing the interests of the profession in various ways. Out of the suggestions already made and more to follow, it is hoped may develop an effective plan of unity.

The old axiom "in unity there is strength" is applicable here if anywhere. One strong organization can achieve results where a number of weaker ones dissipate their efforts in vain hopes of achieving an ideal.

The suggested solutions state the cause for the creation of independent state societies is the Institute's lack of interest in the business side of architectural practice and lack of initiative in advancing state legislation. There may have been a time when this criticism applied, but the record of the Institute in recent years and the cordial relationship now existing between state societies and Chapters give hope that the time may be ripe for an amalgamation.

It is timely to remind the profession that many of its difficulties would soon vanish if each individual were fully conscious of his own responsibilities, and that those of the profession who have achieved distinction and success have earned it largely through competent and worthy service.

Efficient organization can do much, but it cannot of itself cure the ills or solve the problems of its individual members.

The Bulletin is on record favoring public architectural criticism by men respected for their knowledge in the field of building design. The August-September 1937 Bulletin enumerated for the benefit of the "Architectural Forum" editor and others, architectural critics writing in American architectural journals in days passed. H. Van Buren Magonigle in "Pencil Points" was inadvertently omitted. We include him here and now.

If the August-September Bulletin editorial contributed to the renascence of criticism, the Illinois Society is much pleased, for "American Architect and Architecture" has announced monthly critical analysis in its columns by Dr. Walter Gropius. Let the other architectural journals procure each a recognized thinker and writer on architecture to submit his critical thoughts monthly on current work in the Western world.

It should not be long before such analyses have a marked effect on both the conservative as well as the so-called modern architect whose zenith is a horizontal strip facade.

The Duke and Duchess of Windsor are house hunting. They have found two chateaux that would be exteriorally, architecturally satisfactory enough—the Chateau de Gros-Bois and the Chateau de Wideville; but zounds! neither one is fit to care for the ducal friends over night.

Required are eight master bedrooms, each with private bath, and there must be a satisfactory golf course not far from the house. Now where in Europe can His Highness find all this outside of England?

The solution of his problem lies in America—in the Middle West. The North Shore adjacent to Chicago offers excellent sites, golf clubs abound, or if he must have a course all his own, there is plenty of land in the Skokie to be had. And as to a charming house with eight master bedrooms each with private bath—why, architects to plan that and more are so plentiful that he will require a fly-swatter to prevent their clogging His Highness' approach.

Architecture isn't just a cute way of slapping materials together and imposing decoration on them. It isn't that at all. It is an expression, maybe even a salvation.

—*Duffus.*

Le Tourneau Prefabricated Steel Houses

Peoria's Contribution to Prefabrication

The steel houses now being completed by R. G. Le Tourneau Inc. of Peoria bear the stamp of the singular genius of Mr. R. G. Le Tourneau, founder of the concern, and cannot be properly understood without some comprehension of the background for which and by which they are made. For the completed houses are for rent to company employees only. None has been sold, or will be sold, until certain obstacles outlined below have been overcome.

R. G. Le Tourneau is an ardent evangelistic Christian of unquestioned sincerity, and his plant reflects a guild spirit rather than the monotonous regimentation of line production for which modern industry is so frequently criticized. The gargantuan grading equipment and cranes produced by the plant were all contrived and perfected by Mr. Le Tourneau and his aides out of steel by the technique of welding. The plant is a guild of breezy, energetic, impatient craftsmen, whose tools are electric arcs and acetylene torches. They work in steel with the easy familiarity of carpenters working in wood. Evangelistic meetings are frequently held in the plant, sometimes during working hours, and one has the feeling that everyone in the plant and offices is a member of the same family.

When Mr. Le Tourneau moved an important branch of his plant to Peoria from California a few years ago, it was natural for him to think of providing houses for his co-workers, and also natural that the houses should be of steel, welded by the men themselves.

The first house was a "model house" of five rooms and bath with built-in garage, all arranged within a rectangular plan 44 by 32 feet, built like a steel shoe box with large hasps projecting from roof and sides for lifting. It weighs 41 tons, but Le Tourneau has made a crane which lifts it, and a sixteen-wheeled trailer on which it can be pulled over the roads by a one and one-half ton truck, provided permission can be obtained.

For demonstration purposes arrangements were made for moving this house to a city lot. Utility connections were to be made and within a few hours the house was to be ready for occupancy. News-reel cameramen, however, were satisfied with pictures showing the house being pulled on the trailer and the plan was not carried further. No footings or foundations are considered necessary, as the entire structure is rigid. It is also water tight on the bottom, all joints being welded, and the company has announced the intention of floating some of these houses across the Illinois River to a tract of land there owned by Mr. Le Tourneau. This project has been postponed.

More recently a tract of land adjoining the plant was purchased and about ten of these houses stand in this development now, in various stages of completion. These are chiefly three-room houses.

All construction of the enclosure is done within the plant, and the floor is built first. It is a rigid platform made bottom side up out of ¼-inch steel plates, junior beams and channels, all welded together. A second layer of plates is welded to the bottoms of the beams, after fitting soil and supply pipes, and the space between filled with rock wool blown in by a special machine contrived by Le Tourneau. A crane removes the floor, and the roof is then constructed in a similar manner.

Wall panels 46-inches wide are constructed by joining two ⅛-inch steel plates with welded spacers to keep them 4 inches apart. There are three interior rows of these spacers and lacing around the edges of the panels, but the cross-section area of spacers is kept as small as possible in the hope of minimizing the heat loss through conductance. The panels, like the floors and ceilings, are blown full of rock wool, and are welded continuously to one another to form the walls. These in turn are welded solid to floor and ceiling. Interior walls are made like exterior walls, and welded in place. The wall and ceiling sheets are now formed with indented panels to minimize the warping caused by welding. Light-section steel sash of standard make were formerly welded solid to the walls, but are now set in mastic. Doors are wood.

All steel surfaces are primed, whether concealed or exposed, and copper-bearing steel is used, but it is admitted that the copper-bearing steel has very little rust-resisting property and painting is mandatory. The present exterior finish on the new houses is lead and oil, of a reddish brown color with some sand thrown in for texture. Interior finish is the same. Floors of kitchens and baths are covered with linoleum; other floors leave steel exposed. Roofs are covered with a single coat of asphaltic paint. Even the chimneys are steel.

The exhibition house has what is called "air conditioning," but the only refrigerant is well water run through a radiator from the Caterpillar Company, with a simple fan and duct system. Some of the houses now occupied have a bedding of straw on the roofs, possibly indicating the desirability of a lower conductance factor there.

Heating in the smaller houses is arranged by setting a simple stove on the steel floor of the living room. In the demonstration house a standard type warm-air furnace and blower have been located in the garage and a two-ton coal bin is built in to feed the stoker.

In plan the houses are somewhat unusual, and at least one feature of the standard plan was voted on by Le Tourneau employees. In the demonstration house every room, including the garage, opens off the kitchen. There are no passages or circulations. In one of the smaller houses, the bedroom is shown as optional, and the standard arrangement shows a "rolling bed" in the bath room, the other rooms being living room and kitchen. In practice, however, bedrooms are partitioned off from the living room and the bed stands in its traditional place.

None of the men working on the houses is required to belong to a building trades union and the workmanship, while more than adequate for heavy-duty grading equipment, leaves something to be desired in the houses. Floors are solid, but not always flat. Welds in wall sections are occasionally ragged, and the ensemble presents a somewhat homemade appearance. All paint is sprayed.

These houses are not cheap, of course, and although building permits issued for the recent houses stated their cost at $2500, officials indicated they could not hope to build them for sale at or near that price. The house is said to be in the experimental stage, and the company does not wish to be quoted as to the possible retail sale price, but at present one would guess that $5,000 would be rock bottom.

Rents asked tend to bear out this guess. In March 1937, two-room houses rented for $32.50, three-room at $35.00, five-room and garage at $60.00 per month, including water, electric range and electric water heater, linoleum floors in baths and kitchens, but without electricity, heat or furniture.

Inquiries from all over the world have been received regarding these houses, although there no intention of selling them at present. Officials stated they believed it would be feasible to handle large scale industrial housing even in remote localities by shipping parts and assembling them at a temporary field welding plant. Optimism was also expressed about trucking the houses over the roads at night under special permit. Prices would probably have to be higher than those for houses of traditional wood construction, even in completely unionized areas, but company officials emphasize that since there is no sale price at present, all such remarks are conjectural.

—*Carter Edmund Hewitt.*

Reinforced Concrete Section — Chicago Code

Adoption by the Chicago City Council of the reinforced concrete section (Chapter 39) of the new Chicago building ordinance brings to local architects, engineers and contractors many new considerations of design and construction. The new code involves sweeping and fundamental changes in design provisions and in work in the field—changes which will enable the building industry to take advantage of modern methods and advances in reinforced concrete construction.

The Chicago code adopts by reference the 1936 "Building Regulations for Reinforced Concrete" of the American Concrete Institute, with certain exceptions—the principal ones pertaining to the design of columns.

Design of foundations, columns and floor systems is to be based on the assumption that concrete of definite strengths will be used. In order to accomplish this, the code provides that modern methods shall be used in proportioning and in controlling the quality of the concrete. Tests of the concrete are required as a check on results being attained in the field.

Condensation in Walls and Attics

By L. V. Teesdale, Senior Engineer

Forest Products Laboratory, U. S. Department of Agriculture

Condensation or moisture accumulation within walls and in attics or roof spaces has become a subject of considerable concern to many home owners and prospective builders, especially in the states north of the Ohio River. This problem is not new; it has been known for many years that condensation occurs under certain conditions in houses and barns, particularly in localities subject to severe winter weather, but only recently has it become a general problem, particularly in the better class of construction. There have been so many cases in recent years that any prospective builder may hear about ice in attics, stained ceilings and side walls, plaster becoming loose, ruined decorations, decayed side wall, roof, studs, and sheathing, floors that have bulged up, outside paint failures, and numerous other manifestations of moisture resulting from condensation. While no doubt there is some exaggeration as to the extent of damage, there is also much truth. Such instances of damage have been occurring frequently in the last few years, particularly after the cold winter of 1935-36. In some instances the damage is visible, whereas in others it is concealed in the walls and unknown. Even new houses under construction in cold weather often show evidence of moisture, especially if plastered during the late fall or winter months.

Obviously the question arises as to why we hear so much more about this condition now than we used to just a few years ago. The answer is relatively simple. During the last few years there has been a marked tendency on the part of the architects, builders, and home owners to improve homes both new and old with the idea of increasing the comfort of the occupants and decreasing operating expenses. Prominent among these improvements are the increasing use of storm sash, insulation, weather strips, calking around windows and doors, and other means of decreasing heat loss and wind infiltration. Because of the tighter construction the normal humidity or vapor pressure within a house so constructed is higher than in houses less tightly constructed. In addition, as a health and comfort measure the normal humidity is usually augmented by evaporating water or some other means of winter air conditioning. Improvements that add to comfort and health are worth while and should not be discouraged, but it so happens that they introduce the unanticipated moisture problem just described.

A certain amount of water vapor is always present in the atmosphere. The maximum amount of water vapor that can be present depends upon the temperature of the air, being greater at higher temperatures. Air that is completely saturated with water vapor is said to be at its dewpoint temperature and its relative humidity is 100 percent. Air not completely saturated with water vapor is above its dewpoint temperature and its relative humidity is less than 100 percent. Adding water vapor to unsaturated air without changing the temperature of the air will increase the relative humidity and raise the dewpoint temperature. Removing water vapor will have the opposite effects. Raising the temperature of air without changing the amount of water vapor in it will decrease its relative humidity. Lowering the temperature will increase the relative humidity till the dewpoint temperature is reached. Further lowering will cause progressive condensation of water vapor from the air.

The use of relative humidity as a measure of the amount of water vapor present in a given atmosphere is not satisfactory because this relationship varies with the temperature. Hence it is more practical to use the vapor pressure of the water vapor for this purpose, since it is a direct measure of the proportion of vapor present in the air. This property is usually expressed in terms of inches of mercury.

At zero degrees F. air will hold very little water vapor. If saturated air from out of doors at zero degrees temperature is introduced without adding moisture into a house heated at 70° F., the relative humidity will be about 5 percent. However, there are sources of moisture within an occupied house, such as cooking, evaporation from plants, laundry work, respiration, and bathing, so that the normal relative humidity within a home may be about 10 to 15 percent when the outdoor temperature is zero. Evaporation from a furnace pan or water pans on radiators may increase the humidity to 20 percent or more. This means, of course, that the vapor pressure inside of the home will be higher than that outside. Because of the higher water vapor pressure within doors there will be a constant out leakage of water vapor, the amount depending upon the tightness of windows and doors, the permeability of the wall materials, and upon other factors. If doors and windows are loose, water vapor will pass out readily and if tight the leakage will be minimized.

Winter air conditioning means, among other things, maintaining a humidity in the home at some established value intended to be better suited to health, comfort, and protection of woodwork than the normal humidity just described. With winter air conditioning the relative humidity may often be 40 percent or higher. The humidity may be controlled automatically with a hygrostat, in which case it will be relatively constant, but without such control the humidity may fluctuate considerably.

The effect of the humidity or vapor pressure on condensation can be understood by examining figures 1 and 2. Figure 1 illustrates a typical frame wall of lath and plaster, studs, sheathing, sheathing paper, and wood siding. Figure 2 illustrates a wall similar in all respects except that the stud space is filled with insulation. For purposes of illustration the following examples have been chosen: One indoor temperature of 70° F.; three outdoor temperatures of 20° F., 0° F., and —20° F.; and three indoor relative humidities of 40 percent, 30 percent, and 20 percent. When the temperature of the room side of the sheathing is above the dewpoint temperature in the room no condensation can take place within the stud space. When, however, the sheathing temperature falls below the room dewpoint a different set of conditions prevails. If, in figure 1, the lath and plaster offered no resistance to the passage of vapor, condensation could take place on the sheathing with the latter exactly at the room dewpoint. The amount of condensation would be limited only by the ability of the sheathing to function as a condenser and the permeability of the sheathing to water vapor. Since the lath and plaster do offer some resistance to the passage of vapor, the vapor pressure within the stud space will be less than that within the room whenever there is vapor movement through the lath and plaster. Actually, therefore, condensation cannot take place within the stud space until the sheathing temperature is appreciably less than the room dewpoint. When condensation is actually taking place on the sheathing, the vapor pressure within the stud space will be largely determined by the sheathing temperature and will, in general, correspond rather closely to saturation pressure at this temperature. The three jagged lines marked "temperature" show the temperature gradients from one side of the wall to the other for the three chosen conditions. The three dashed horizontal lines marked "dewpoint temperature" serve to locate the dewpoint temperatures for the foregoing three indoor relative humidities. The water vapor pressures corresponding to these dewpoints are also marked on the respective lines.

Comparing figures 1 and 2, it is at once evident that, within the stud space, the temperature gradients are much steeper in figure 2 than in figure 1, and that the respective sheathing temperatures are

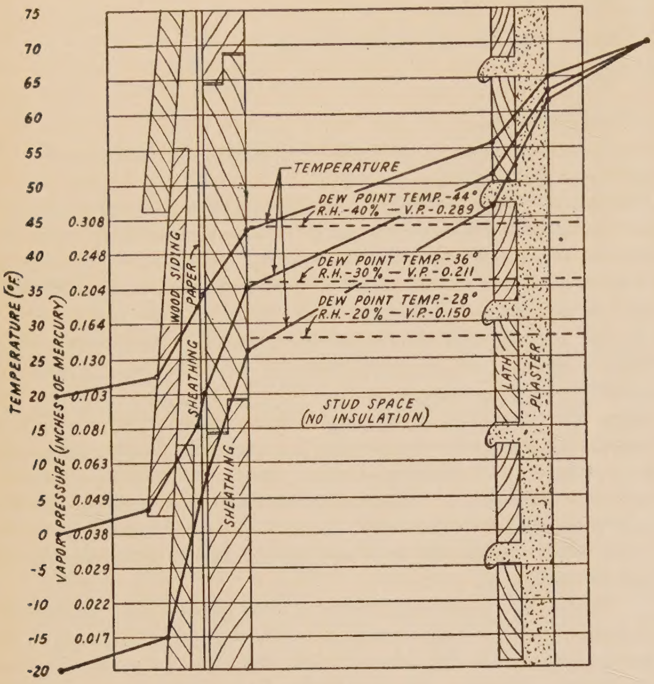

Figure 1

much lower in figure 2 than in figure 1. This results from the addition of insulation in figure 2. Because of the lower sheathing temperatures, condensation will occur on the sheathing with lower room humidities when insulation is used than when it is not used. Conditions within the walls are actually more complicated than the drawings and examples indicate, because they are not static, and matters of heat balance and rates of water vapor movement and air movement have important effects upon what goes on.

Referring again to figure 1: When the relative humidity within the house is 40 percent the vapor pressure is approximately 0.289 of an inch. The temperature gradient through the wall when the outside temperature is 20° below zero intersects the room side of the sheathing at about 26° above zero and, assuming saturated air at this point, the vapor pressure there will be only about 0.137 of an inch. This difference in vapor pressure will cause vapor to move from the room through the plaster to the stud space and condensation will develop in this space. This condensation will eventually appear as frost or ice on the sheathing, which is below the freezing point. The still lower temperature and vapor pressure on the inner face of the sheathing paper will cause some of the remaining moisture vapor to move from the inside face of the sheathing to the colder face of the paper but as the resistance to such movement is greater through the sheathing than through the open stud space the rate of vapor movement will be correspondingly small. However, with a rise in outside temperature the ice may melt and some water may be absorbed by the sheathing. Some may even run down inside the wall. The better grades of sheathing paper commonly used are very vapor resistant and very little vapor will pass through, but with changing outdoor temperatures when cold weather is followed by mild temperature the ice that forms between the sheathing and the paper may melt behind the paper, run down to a horizontal joint where some may work through and wet the siding. This is one source of moisture that may contribute to paint failures.

The same general principle of vapor movement exists where fill insulation is used. The insulation itself is not resistant to vapor movement and the bulk of the condensation appears on the inside face of the sheathing. However, in the insulated wall the resistance to heat loss offered by the insulation results in a much lower temperature at the sheathing line, consequently the sheathing is below the dewpoint temperature at much higher outside temperatures than

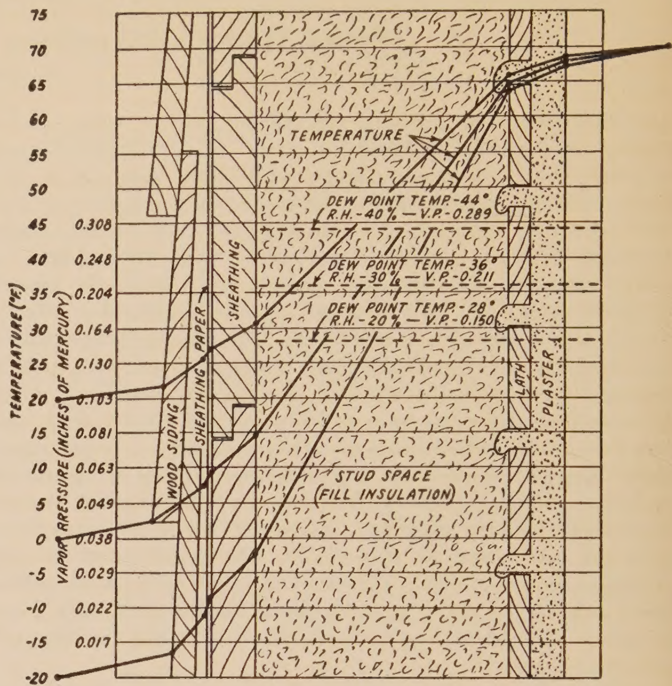

Figure 2

is the case in uninsulated walls. This fact in turn very greatly increases the amount of condensation that may collect, since periods of extremely cold weather, such as are required to cause condensation in uninsulated walls, are of relatively short duration but there may be a total of several weeks during the winter when the outside temperature is low enough to cause condensation in insulated walls.

There are a number of types and kinds of insulation on the market and the potential buyer often hears that certain types "draw water" and become wet. This is not true. Such insulation, because of its efficiency in reducing heat loss, lowers the temperatures within the wall and thus sets up the condition that increases the amount of moisture that may accumulate. Once understanding the conditions that cause the moisture it is also possible to provide means of prevention as discussed later.

The conditions that cause condensation in side walls also occur in attics or under roofs, modified more or less by any ventilation that may be provided or that may occur naturally. Roof condensation is reported far more frequently than side wall condensation, not necessarily because it occurs more frequently but rather because it is more likely to be seen by the occupants. For example, in a pitched roof house having, say, fill insulation in the ceiling below the attic, condensation may develop during a severe cold spell on the under side of the roof boards, forming as ice or frost. When the weather moderates, or even under a bright sun, the ice melts and drips on the attic floor, leaks through and spots the ceiling below. Often such spots are assumed to be roof leaks and cause owners and contractors considerable unnecessary expense in attempting to waterproof a roof that is not leaking. If the attic has adequate ventilation little or no trouble will occur but adequate ventilation is sometimes difficult to attain, and tends to increase the heat loss.

The movement of water vapor is independent of air movement to the degree that no general circulation of air is necessary to carry the vapor into the wall. The vapor actually moves by diffusion from zones of higher vapor pressure to zones of lower vapor pressure. In fact plaster is very highly resistant to air infiltration even when under a pressure equivalent to a wind velocity of 15 miles per hour but no such pressure exists within a house. Vapor, however, will move very readily through plain plaster but is retarded somewhat by paint coatings and other surface treatments. Other types of wall surfacing materials, such as plywood, fiber boards, and plaster boards are also permeable to vapor and here again the surface decorating material has more or less effect on the resistance. In the case of plywood the type of glue used is also a factor, the phenolic resin glues being much more resistant than soy bean and casein glues to the passage of vapor.

Moisture accumulation within a wall like those illustrated in figures 1 and 2 is affected by five factors:

1. Outside temperature and humidity.
2. Efficiency of insulation.
3. Inside atmosphere (temperature and humidity).
4. Resistance of outer wall to vapor movement.
5. Resistance of inside wall to vapor movement.

As the outside temperature and humidity cannot be controlled and as insulation adds to comfort, health, and fuel economy, methods of prevention are limited to the three other factors. Some authorities believe that indoor humidities low enough to preclude the possibility of moisture accumulation are undesirable both as a factor of health and comfort and in preventing the overdrying of interior woodwork and furniture. It is possible, of course, to compromise and carry somewhat lower humidities during very cold weather than are maintained during moderate winter weather and thus reduce the amount of moisture that would accumulate as condensation. It is also possible to so construct walls that the vapor could pass outward through sheathing and sheathing paper and escape through openings in the outside wall covering or be carried away by ventilating the space between the sheathing and outside finish. Standard construction does not lend itself to this method of moisture elimination. Either the inclusion of ventilating holes in the side wall material or a ventilating space would require more or less modification of the conventional construction. One possible method for wood siding would be to place 1 by 2 inch furring strips over the sheathing thus obtaining a vertical ventilating space approximately of ¾ of an inch which should be open to the outside at both the bottom and top of the wall so that air could enter at the bottom and pass out at the top. The openings could be concealed behind but not covered by mouldings or other treatment at the water table and cornice. Similar ventilation could be adapted to stucco, brick, and stone exteriors. With this method the sheathing paper should be of a type that passes water vapor readily, such as slaters felt. During periods of protracted cold weather it is quite possible that moisture would accumulate in the wall faster than it could pass through and be removed by ventilation, hence the ventilation method might not assure complete protection. So far, the possibilities in this method have not been thoroughly investigated by the Forest Products Laboratory.

Attics under pitched roofs can often be ventilated either through windows or louvered openings, ventilators in the roof, or openings in chimneys. Wood shingle roofs when laid on roof boards that are separated about 2 inches will often allow enough ventilation in the attic to eliminate the moisture problem. Flat roofs are more of a problem. Where the ceiling joists or supports and roof joists or supports are separated enough to allow a free circulation of air, and where sufficient openings and vents are installed a fair degree of ventilation can be obtained. Often the space under flat roofs is not sufficient to obtain adequate circulation.

The most positive, and least expensive, method of control so far experimented with at the Forest Products Laboratory is the use of vapor resistant barriers at or near the inner face of the wall and under ceiling joists under the attic. In houses under construction this barrier can be attached to the inner face of the studs after the walls have been insulated and before lathing or finishing the wall on the inside. In houses already plastered the barrier can be some suitable material or treatment applied to the interior surface of exterior walls. While it might appear on first thought that such a barrier should be 100 percent resistant, actually, however, it is not practical to obtain 100 percent efficiency. With a suitable barrier, however, the amount of moisture entering the wall is so small that it will not raise the moisture content to a degree that is objectionable.

The Forest Products Laboratory has been making tests on the vapor resistance of various materials used in wall construction and also on many materials that might be used for moisture barriers. Although these tests are still under way and have not covered all possible materials, enough information is available to permit the selection of a number of materials that are highly resistant to the passage of water vapor. Among these are (1) asphalt impregnated and surface coated sheathing paper, glossy surfaced, weighing 35 to 50 pounds per roll of 500 square feet; (2) laminated sheathing paper made of two or more sheets of kraft paper cemented together with asphalt; (3) double-faced reflective insulation mounted on paper. The water-vapor resistances of these three materials, as measured at the Laboratory differ considerably one from another. Unfortunately, the work has not progressed far enough yet to enable a definite statement of the precise degree of vapor-resistance required for any specific set of conditions. Most of the discussions and recommendations in this preliminary article are based upon a climate such as that of Madison, Wis., and upon plastered wood construction. The recommendations have not yet been subjected to actual service tests, and may have to be modified as time goes on.

The barrier when located as described on the warm side of the dewpoint position resists the passage of moisture while it is in the form of vapor and therefore before it has a chance to condense into water. Hence there is no hazard of water forming behind the plaster or other interior wall finish. The barrier also prevents moisture from getting into the wall or attic space during the construction period, particularly during the plastering operation.

Such vapor barriers should be applied vertically on side walls with edges lapping on the studs after the insulation is installed and before lathing. Horizontal joints should be made only where backed up with a plate or header. The barrier should be brought up tight against electric fixture outlets, air registers, door and window frames, and other similar openings. If wood lath, metal lath, or other types requiring a plaster key are used the paper should be applied slightly loose so that the plaster can push the barrier back to form the key. Where the ceilings below the attic or roof are insulated the barrier should be applied in a similar manner.

Walls finished with such materials as plywood, fiber board, plaster board, and the like, should also have the barrier as described. Sheathing paper when used outside of the sheathing in combination with the moisture barriers described should be water-resistant but not very vapor-resistant so that the small amount of water vapor that may leak through the barrier can escape outward. Slaters felt meets this requirement. Quite possibly the sheathing paper could be omitted entirely; and it is conceivable that the omission would actually result in a drier wall. Further experiments will have to be made before this point can be definitely settled.

Some kinds of mineral wool are relatively resistant to water absorption, others are treated to make them resistant to wetting by water. This property, while desirable, does not make these materials resistant to the passage of vapor. Therefore they should not be considered a source of protection against condensation.

Some types of mineral wool have a vapor-resistant paper back attached to the batt. Tests to date indicate that none of these papers has a vapor resistance equal that of the 50-pound sheathing paper previously mentioned. They are sufficiently resistant, however, to be of definite help in keeping the insulation and the wall dry and to warrant proper care in installation. The wool batt is made to fit between standard stud, joist, and rafter spacing with tabs on the paper which extend out from the batt and are tacked to the studs or rafters. The batt may be cut or forced back to obtain the tabs at the end of the batt. Where the spaces are not standard between studs, such as occurs around windows, doors, and dormers, particular care should be taken to obtain good joints even if it is necessary to use one of the barriers previously described.

Blanket types of insulation are also available where the insulation is enclosed within a heavy paper covering treated with asphalt. This paper covering is a fairly effective vapor barrier but not so effective as the 50-pound sheathing paper. It is important that this type of insulation be carefully installed so that vapor cannot work through around the edges. The tabs should be nailed to the face of the studs with the insulation looping loosely inward away from the inner face of the wall or if installed between studs it should be fastened in place with wood strips.

Fiber board sheathing is often used as a substitute for wood sheathing and because of its lighter structure it offers more resistance to heat loss than a similar thickness of wood. It may be used either with or without other insulation. When used with other insulation the methods of protection suggested should be followed. When no other insulation is used the need of a moisture barrier is much less, just as with wood sheathing.

Many materials embodying the principle of reflective insulation are in use but opportunity for observation and tests has been limited. One type having metal foil attached to both sides of a heavy sheet of paper is very resistant to vapor and another type composed of a strong paper faced on both sides with metal oxides is also very effective in resisting vapor transmission. Data upon the comparative vapor resistance of these papers and many other materials are to appear in a forthcoming article.

The practice of installing insulation in existing houses, some of which have been built for many years, is becoming general, adding both to summer and winter comfort of the occupants. The occurrence of moisture or condensation in these older houses after insulation is quite uncommon, largely because such houses are not so tight as new houses, windows fit less snugly and probably have no weather strips. Under such conditions the normal humidity is lower. Occasionally, however, these older homes will also show evidence of moisture accumulation and generally when the occupant has made an effort to increase the humidity above normal. Some of the companies that insulate existing houses take off a portion of the outer wall covering and cut a large number of openings in the sheathing through which the insulation is blown and replace the outer covering without filling the holes in the sheathing. These openings allow more or less ventilation and should be helpful in allowing vapor to escape outward. Some companies include some form of attic or roof ventilation as part of their contract.

Positive protection for existing buildings that have a moisture problem or where it is proposed to install winter air conditioning may require some type of barrier on the interior face of exterior walls and on the ceilings below the roof. Ordinary paints of the flat wall, or lead and oil types do not seem to offer the resistance desired but two coats of aluminum paint appear to offer excellent resistance and permit almost any subsequent method of decoration desired.

The question sometimes arises as to the possibility of summer cooling causing condensation in walls. This is very unlikely because the inside temperatures are seldom more than 15 degrees below outside temperatures so that the possibility of condensation would only occur during periods of extremely high humidity outside. Such a condition would be of rather short duration and would be unimportant.

General Recommendations

For new construction it is recommended that a suitable vapor barrier be installed on the side wall studs and below the ceiling insulation and that some attic ventilation also be provided. This will not only protect the house for normal humidities but should prove ample protection in case winter air conditioning is installed. Further, it offers protection during the construction period, particularly if plastering is done in cold weather.

For existing houses that have been or are to be insulated, and where humidities during cold weather are low, attic ventilation alone should be adequate. Should evidence of moisture appear in mild weather following a cold period, cut off all possible sources of humidity for the balance of the winter and some time later in the following summer, after the moisture has had time to disappear, coat the exterior walls and the ceiling below the roof insulation with two coats of aluminum paint after which redecorate as desired.

For existing houses that are equipped for winter air conditioning follow the foregoing suggestions and during periods when outside temperatures are below 15° F. carry relative humidities not higher than 30 percent and in sub-zero weather reduce to 20 percent relative humidity.

The suggestions offered here are based upon tests now under way at the Forest Products Laboratory combined with observation and experience in occupied homes. As these tests and observations are continued and additional information becomes available more specific recommendations for protection against moisture condensation will be forthcoming.

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Modern Housing in Chile and Peru

The Compulsory Social Security Administration of Chile is carrying out low-cost housing for workers. Lo Franco is a development of 500 houses in Quinta Normal Park in Santiago and includes buildings for social services, cooperative stores, workshops, medical and welfare centers, workingmen's club and athletic field. The 500 houses have walls of brick, roofs of cement or clay tiles, windows, doors and floors of raulé—a variety of beech. One hundred and thirty additional houses are proposed as well as apartment houses with a capacity of 250 families.

The San Eugenio apartments in Santiago comprise 192 units of 1, 2, 3 or 4 rooms with bath and kitchen. Patios, public baths, a common laundry and a school for 100 pupils are provided. In Antofagasta is the "21 de Mayo" development in three types. Here the inner and outer walls are of stucco blocks. The Lota Bajo housing comprises 262 one and two story houses.

The Compulsory Insurance Administration is building the Grau community of 178 houses, a kindergarten, and a group of bachelor apartments. Three other workers' housing developments in Santiago exist.

The Republic of Peru is carrying out two workers' housing projects, one in the Victoria, the other in the Rimac district in the city of Lima. One hundred and five houses with modern sanitary conveniences have been built and are being sold to workers on most favorable financial terms. This construction is closely linked with the support of people's restaurants in Lima and Callao and the daily distribution of 10,000 free breakfasts to school children. In the Victoria development the government has taken pains to provide each dwelling with a minimum amount of furniture to give its inhabitants complete comfort. The walls are of stuccoed brick with roofs of concrete and hollow tile. Each house plan comprises a combined living and dining room, two, three, or four bedrooms, kitchen, bath, patio and garden.

The Rimac model subdivision house plans are exactly like those of the Victoria district. This project, however, includes a fine athletic field.

The Weal of Nations

An Inquiry into the Nature and Value of Non-Productive Services

by Adam Phool

With Apologies to Adam Smith and his "Wealth of Nations"

Why is economics sometimes called the "dismal science?" It can and should be made a most interesting game, if only misleading statistics and confusing words be eliminated and study of man's relations to the world as well as to his fellow man be injected into this game. Is it a science? The writer thinks not. Were it a science, important discoveries could be recorded since the work of Adam Smith. There are no such records.

Before astronomy came astrology. Before chemistry came alchemy. We have economics, but when shall we have the science of abundance, meaning the weal or welfare of nations?

Einstein's fourth dimension—time—he adds to length, breadth, and thickness. Franklin with his kite established lightning as electricity—positive and negative. Classically, economics is described as having to do with the protection, distribution and consumption of wealth. To these three dimensions should be added a fourth—the protection of wealth.

Economics deals with man, his needs and wants and their satisfaction. To satisfy these needs and wants, man applies his energy to what he finds in nature. His energy has been treated like lightning, not scientifically controlled and used. His energy should be treated like electricity—positive and negative, scientifically understood, controlled, and used.

Positively it can be used to increase and more wisely distribute and use things that have value. Negatively it can be used to prevent the loss of things that have value and destroy things that are harmful. Man's universal needs are usually described as food, clothing and shelter, but clothing is one kind of shelter. Therefore his universal needs can be described as Food or Nourishment and Shelter or Protection.

The objects of nature are usually described as animal, vegetable and mineral. It is difficult in the lower orders to distinguish between animals and vegetables. Therefore what man finds in nature can properly be put in two classes: Organic—things that have life. Inorganic—things that have not life.

Man cannot create organic natural resources. He can only find them. Originally he found them wild and used them for nourishment. Later he studied their habits, cultivated them and by cooperating with natural laws and forces he helped nature to increase their quantity and quality. Thus he is able to satisfy his need for nourishment. Also, many organic materials can be converted into clothing by the application of his intelligently directed energy.

Let us consider the requirements of man for protection aside from clothing. This means housing of various kinds, such as homes, schools, churches, hospitals, railroad stations, office buildings, music halls, prisons, libraries, post offices, theaters, movie houses, barns, warehouses, manufacturing plants, etc.

In order to supply his needs in this field, man applies his intelligent energy to the inorganic raw materials he finds in nature by moving them and changing their form or condition, thus increasing their value by adapting them to his needs and wants. In the field of construction he does not produce for consumption. He constructs for use.

—Herman L. Matz.

Inflation and Construction

Dr. John Parke Young, Chairman, Department of Economics at Occidental College, Los Angeles, in addressing a meeting of the Construction Industries of the Los Angeles Chamber of Commerce on "Inflation and Construction" among other things said:

"The monetary system is the heart and soul of the nation. In 1915 a certain amount of commodities could be bought for $100; in 1920 it took $260 to buy the same amount; in 1921, $140; in 1932, $90; and in 1937, $130.

"In this country there has been a lot of inflation from time to time. The Revolutionary War was financed with inflated currency, known as 'continental' money. The Civil War was fought on printed 'greenbacks,' $3 of which were equal to one gold dollar. During the World War all countries printed paper money, with the resultant skyrocketing of prices. In 1925 and again in 1928 we reached the peak of construction prices; but we can expect that construction prices will feel inflation along with other prices.

"Gold does not have much effect on commodity prices; credit and bank deposits have the more important effect. Since 1796 this country has had 33 cycles, the average length being four years. In these cycles there have been 1½ years of prosperity for every year of depression. In England the average length of the cycle is six years with 1-1/10 years of prosperity per year of depression. Canada has the best record of all with two years of prosperity for each year of depression. Backward nations such as China and Brazil have one-half year of prosperity for each year of depression."

Small Holdings, Planlessness, Congestion

If you will think of a town growing rapidly, with each person owning land on the fringe of the town eager to get as much as he can for his land at the time, without thought as to the future of the town or the future value of the land, it is quite evident that it is not in the power of the individual owners to control or guide general development. As a result, in expanding towns during the 19th century, new buildings were being erected haphazard constantly on the fringe of a town; buildings that were not congenial with the adjacent existing part of the town. Factories were erected adjacent to commercial premises, residences, etc. We find that the streets were planned to meet the needs and the shape of individual ownerships of land rather than with regard to the interests of inter-communication for the whole.

There is an area of West London, northwest of Hyde Park, which shows one large estate well-planned early in the 18th century. Outside is a hopeless confusion of developments by little owners. On the whole, large ownership of land is much better than small ownership. In many other parts of London may be seen the kind of lower grade suburban development, which is a good example of the kind of haphazard planning of streets which took place there during the 19th century, with rows and rows of houses. Many of them have for open space nothing but little backyards. There is no consistent plan of streets. These are obviously based on the small ownerships.

Looking at Manhattan Island as seen from the lower end looking uptown, you may see the gridiron plan with Broadway cutting across it. It has indeed a plan, but the difficulty of this plan is that it is without parts of magnitude; no one location is naturally better than another. If you want to go from one place to another, there is no reason why you should go one way rather than any other; the distances will be the same, and all of the ways take you round two sides of a triangle to get there. There is no coherent plan based on the fitting location of important points, such as might establish a satisfactory relationship between the parts.

On Fifth Avenue you may see a very expensive house hemmed in on both sides by tall tenements. It is natural that a person who could afford such a house would not be interested in living any longer in such a neighborhood. The value of this private house, as a result of the freedom of his neighbors to erect what they like on their plots, has been destroyed; and to add to the misfortune, the owner will be taxed on the potential value of his house and garden as a site for a similar mass of building. In another place, one may see a shop front jutting out in front of a residence. You are gradually checking this kind of intrusion by zoning.

The problem of traffic in New York is a very serious one, not only because of the plan, but because of the method of building up so high. A chart was made which shows what would happen if all the persons in the Woolworth building came out at one time to get into their cars which were parked on the street in front, allowing one car to every ten persons. Of course, this is an impossible situation, but it does illustrate the kind of strain you throw upon the streets when you build very high buildings. Conditions in the streets at busy times in the loop at Chicago further illustrate this.

—Sir Raymond Unwin.

Illinois Society January Meeting

Announcement of the Illinois Society of Architects' January meeting on the 25th with Laurence V. Teesdale, Senior Engineer of Forest Products Laboratory, Madison, Wis., as the principal speaker, brought to the dinner ninety members and guests with an accretion of twenty more, making a total of one hundred and ten attendants at the meeting following the dinner. This proved to the officers the interest Mr. Teesdale's subject "Condensation Problems in Modern Buildings" has for architects.

Secretary Fairclough read the detailed minutes of the November meeting. The Society holds no December meeting because of the holidays falling at the same time. Edward D. Pierre, President, Indiana Chapter, A. I. A. was introduced. President Jensen outlined the Society's activities as now carried on through various committees, dwelling particularly upon the committee studying and analyzing building costs, which committee at the same time will make comparisons of the standard construction used for years with the construction of new materials aiming to get the same results at lower costs. He had something to say on prefabricated houses, claiming that prefabrication had been practiced by architects in selecting material for many years. Eugene Fuhrer, Chairman, Building Valuation Committee, at this point supplemented the President's remarks on cost analysis. The President announced the formation of a building material exhibit to be installed in the Merchandise Mart and the Society's interest in suggesting house models of various types for installation in this exhibit.

President Jensen announced the Middle West Conference of the A. I. A. Committee on State Organization on January 26 in Chicago. The function of this Committee is to study and recommend measures for affiliation or amalgamation of state societies and associations with the A. I. A. He announced Arthur Woltersdorf as the Society's representative in this conference.

Henry K. Holsman was called upon to speak on the effect of the new housing law passed by the special session of Congress with 90% loans for federally approved housing insured by FHA. He said that President Roosevelt was particularly anxious to see private capital go into large scale housing projects. He carefully analyzed the difficulties, the many taxes that a housing corporation would be subjected to, including the same tax on profits applicable to other corporations, and came to the conclusion that the circumstances were too discouraging to appeal to private capital. He proposed a resolution exempting housing corporations from income profits taxes. The resolution was passed.

President Jensen now introduced Mr. Teesdale as a welcome guest and old friend of the Society who, after a lapse of two years, had come to report what progress had been made since then in condensation problems in houses. Mr. Teesdale had brought with him two charts, hung on the wall, giving a graphic illustration of the movement of temperature and moisture through enclosing walls. This issue of the Bulletin reproduces those charts and gives Mr. Teesdale's paper in full.

Mr. Teesdale spoke extemporaneously. For condensation cures, he recommended vapor-proof papers hung vertically from the ceiling and dropped to the joists, properly lapped and secured to the inner face of studs behind the plastering. The same treatment was recommended for the underside of attic joists. For outside face of studs he recommended slaters felt. For older houses where getting back of plaster and back of sheathing was impractical, he recommended two coats of aluminum paint on the finished putty coat and where there is a sand finish, a good coat of size before the two aluminum coats are applied. This prescription he considers effective where the rooms of houses have not more than 50% humidity.

On Oneida Lake, in New York State, there have been uncovered by archaeologists of the Rochester Museum two large Indian village sites which date back more than 2,000 years. What was found indicates that at the time the mighty Ptolemies reigned in Egypt, while Caesar and Pompey were fighting it out and while the first water-clock was being used in Rome, the American Indians had a culture of their own on this continent. As to whether they had a civilization is another question. A culture always precedes a civilization. A civilization dies, but a culture may persist.

December and January Chapter Meetings

Wisely the December 14 meeting of the Chicago Chapter, A. I. A. was shifted to December 7 to be able to honor as guest and listen to the words of wisdom from that gentlemanly scholar and rare architect, the new President of the A. I. A—Charles D. Maginnis. This occurred at the Tavern Club of Chicago where seventy-two members and guests assembled at dinner. It was gratifying to find among those present two past presidents of the A. I. A., Irving K. Pond and C. Herrick Hammond, and seven members of the Wisconsin Chapter, A. I. A.—Richard Philipp, Gerrit J. de Gelleke, Leigh Hunt, Carl Eschweiler, Harry Bogner, Frank Drolshagen, and Roger Kirchoff. There were present a few prominent members of the Producers Council Club of Chicago. Cocktails accompanied the informal reception and served well to instill companionship among the diners.

In opening the meeting, President Merrill asked the secretary to read the minutes, but Elmer Roberts followed a custom that has become all too common in the Chapter by moving that the minutes and all regular business be dispensed with. Elmer Jensen, President of the Illinois Society of Architects, paid his respects to President Maginnis and welcomed Mr. Pond back from his sick bed. Alfred Shaw was introduced as one who had worked as an assistant to Mr. Maginnis' firm in Boston in years past.

President Merrill used the Boston Convention of the A. I. A. as a stepping stone in his introduction of the distinguished guest, and when President Maginnis took the floor there was complete silence, the company desiring to lose nothing of his thoughts couched in English that was beautiful and words that were wise. There was humor, too, particularly on the subject of Shaw's severance from the firm of Maginnis and Walsh, and the speaker's reference to the Institute in the mind of the Chapters and the Chapters in the mind of the Institute. He referred to Louis Sullivan having been born in South Boston and of some irrepressible men in the Boston Chapter, such as Shepley and Ripley. He touched on the subject of the private architect's relation to the government, and Admiral Peebles of the Procurement Division; of membership in the A. I. A.; the work of the Institute's publicity committee; and finally, architectural design.

He told of his generation's architectural education beginning with the Orders and how, in historic architecture, these Orders had been used and changed in proportion, depending upon the materials, reaching their own elegance and refinement in wood in colonial buildings. He referred to the powerful and masterful Richardson, to the delicate and sensitive McKim, and pronounced the White City of the World's Columbian Exposition of '93 as beautiful scenery, but not architecture. He analyzed the skyscraper and said that this type of structure harbored many headaches for the city of New York in years still to come; that the skyscraper still challenged a final solution. He paid his respects to the leadership of Louis Sullivan and Frank Lloyd Wright and regretted the present-day subserviency of the architect to the engineer, a condition that is not happy in its architectural results. He said the street car was not a beatific vision and the New York ferryboat, architecturally considered, largely a matter for ridicule. He recognized the validity of the modernist theory, even though the concrete results were too often sorry. He expressed his admiration for modern Scandinavian architecture and called it free from the fevers of Central Europe.

The world, he said, cannot live completely withdrawn in the midst of engineering and pronounced ours a Lenten time for architecture; that architecture must submit itself to the eye as well as to reason. He was sympathetic to modern architecture as expressed by Paul Cret and a few others, but generally he thought modern architecture needed a purge. Romance is not dead and the principle of beauty still lives.

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With an attendance of thirty-five, the Chicago Chapter held its January meeting on the 11th in the Architects Club of Chicago. On the program were two guest speakers—Walter R. McCornack of Cleveland, Great Lakes Director and Chairman of the A. I. A. Housing Committee; and Andrew Sandegren, U. S. Construction Engineer in charge of the Post Office and Custom House which the Government is erecting at Nome, Alaska.

The regular business was confined to the Secretary's minutes of the previous meeting and announcement of the death of two members—George Helmle and Henry J. Schlacks. After President Merrill's short introduction of Mr. McCornack, the speaker dug in, advising architects to cooperate with the Government, for if private organizations would not or could not achieve low-cost housing with the help of FHA, the Government would inevitably step in and take the job. Two million housing units are needed with rentals not to exceed $25 and $30 per month. In the matter of cost of construction, the speaker held that it is by no means only a labor cost that troubled, but that equipment such as plumbing, heating and electricity costs must be cut down. This he held could be achieved by giving manufacturers the problem to prefabricate the assemblage in the factory before delivery to the building.

Changes in building codes are required and basic building codes stressed. He insisted that labor must abolish jurisdictional disputes. He prophesied a change in trade classification. He called for three units—wet, dry, and pipe trades. The architect, he maintained, must be ready in leadership with government; that architecture was a profession, not a business; and that something must be done to rehabilitate communities in general which throughout the land have become ugly. The watchword from Washington was to decentralize housing. He prophesied clinics for architects under FHA and advised that architects organize committees for this purpose.

When the President called on John Fugard to introduce Andrew Sandegren, the hearers learned that Sandegren was a Chicago boy, as a youth went to whaling at Acutan in the Aleutian Islands, returned to Evanston, for four years studied engineering at Northwestern University, followed with six years in the office of Thielbar and Fugard, architects, and when private work in architects' offices dried up, secured employment in the Treasury's Washington Architects' Office.

With all this experience and his hardy Swedish stock, he was selected as engineer in charge of the U. S. Post Office and Custom House at Nome, Alaska. He had returned from there late in October after seeing the unusual foundations necessary put in, and returns later to Nome to guide the super-structure.

Sandegren's talk was largely a travel talk, leading through the interior into the northern reaches of Alaska where Nome is located. Alaska, he said, was a country without roads. It had jumped from the dog sled to the airplane and approach to Nome over land is by airplane from Fairbanks. Bering Sea, though salt water, is frozen over nine months of the year. Summer temperature at Nome rises to 70°F. The ground is frozen to an undiscovered depth. It is overlaid with tundra near the top, though the top is ice or frozen snow, rising and falling with the weather. So this upper crust was removed and a reinforced concrete mat covering the building's area spread over the tundra with piles under the outer walls, capped with a reinforced concrete course. On this course the walls will rise of 4 by 6 wood studs through three stories, with 6 inches of insulation between outer and inner enclosures of the studs. There will be no plastering. Wallboard forms the inside finish. Sewer and water pipes run in insulated larger pipes and these pipes are steamheated, the sewage thus carried to a septic tank.

1938 Edward Langley Scholarships

The American Institute of Architects from January 1 to March 1, 1938, will receive proposals of candidates for Edward Langley Scholarships for the year 1938. Awards will be announced about June 1, 1938.

These scholarships are awarded annually for advanced work in architecture, for study, travel or research, as the holder of the scholarship elects. Awards to undergraduates are precluded, but awards may be made to architectural draftsmen who desire to do undergraduate work or take special courses in architectural schools. An award in a succeeding year to a holder of a scholarship is not precluded. Competitive examinations will not be used as a method of selection.

The awards will be made and the grants determined by a committee of the Board of Directors of the Institute, according to the character, ability, need, and purpose of each candidate and the funds that are available. Only a limited number of awards can be made in any year. A candidate should not be proposed unless his qualifications are outstanding and it is evident the profession will be benefited by an award to him.

The scholarships are open to all persons engaged in the profession of architecture. To facilitate making the awards, such persons are grouped as follows:

Group 1: Architects in active practice; architectural draftsmen employed by architects, whether draftsmen are engaged in drafting, writing specifications, supervising, or acting as executives, and whether or not they are college graduates.

Group 2: Teachers in schools of architecture; students about to graduate from such schools; post-graduate students of such schools who are engaged in post-graduate work either in college or in travel.

Proposals of all candidates must be made in duplicate on printed forms which may be obtained from The American Institute of Architects, 1741 New York Avenue, Washington, D. C.

GROUP 1 CANDIDATES. Any architect in the United States or Canada may propose any other architect or architectural draftsman as a candidate for an award in Group 1, but no one shall propose himself. All proposals of candidates under Group 1 must be sent to the Regional Director of the A. I. A who represents the district in which the proposer and the candidate reside, and must be in his office not later than March 1, 1938. The name and address of the Regional Director will be furnished with the printed forms of proposal.

From the proposals received by him, the Regional Director will nominate a prescribed number of candidates from his district to the Board Committee. The Director may request any candidate to submit examples of his work and to appear before him or his representative.

GROUP 2 CANDIDATES. The faculty or head of any architectural school approved by the Institute may propose any teacher in any such school, or any graduate of such engaged in post-graduate work in the school or in travel, or any student about to graduate from the school, as a candidate for an award in Group 2, but no one shall propose himself. Proposals of candidates from Group 2 must be sent to the Committee on Education, American Institute of Architects, 1741 New York Avenue, Washington, D. C. and be in that office not later than March 1, 1938.

From the proposals received by it, the Committee on Education will nominate a prescribed number of candidates to the Board Committee.

AWARD OF SCHOLARSHIPS. The Board Committee will make its selection for awards from the candidates nominated to it by the Regional Directors from Group 1 and by the Committee on Education from Group 2.

Lightning Protection Code

The National Bureau of Standards, with the cooperation of the American Institute of Electrical Engineers, has developed a code for protection against lightning. The National Bureau has published this in pamphlet form and it has the approval of the American Standards Association.

The pamphlet states that nine-tenths of the property damage caused by lightning occurs in rural areas; 400 people on an average are killed each year in the United States by electric bolts from the sky. Placing lightning rods on small buildings in urban areas, particularly near large buildings, is uneconomical because of protection afforded by the larger structures. Large buildings should always, however, be rodded. Users of lightning rods are cautioned to see that they are properly connected to the ground or else they will not perform their function adequately.

Persons in the open during an electrical storm are advised to seek shelter in as large a building as possible. Failing that, they should seek the shelter of a cliff or dense forest.

A lead roof has again been employed in the reconstruction of Rheims Cathedral. The new roof replaces one set in 1481 which lasted in good condition up to the bombardment of 1914. Nails are never, under any condition, driven through the lead. The restoration was made possible by a gift from the Rockefellers.

100th Anniversary of George B. Post

December 15, 1937 marked the 100th anniversary of the birth of George Browne Post, famous New York City architect. He died November 28, 1913. He studied engineering at New York University and architecture in the atelier of Richard M. Hunt. He served two years in the Civil War, entering as captain of a N. Y. National Guard regiment, retiring from service as colonel with citations for gallantry in action.

In 1879 Post designed the New York Produce Exchange building, which still stands at the foot of Broadway and has court walls of skeleton construction, using cast iron columns and wrought iron girders. Street walls had to be heavy masonry to conform with the then New York City building laws. In 1883 he designed the Mills building at Broad street and Exchange place, carrying his cage type of construction further and installing the first plant for generating electricity in an office building. He was architect for the St. Paul building in 1897-99 at Broadway and Ann street, then the tallest building in New York, but in 1868 in his 7-story Equitable building he introduced the first elevators ever used in an office building.

Among his other buildings are New York Stock Exchange, the original New York Times building off City Hall Park; the original New York Western Union building, New York Cotton Exchange, Pulitzer building, and Union Trust Company building, as well as many others. In the Cleveland Trust Company building he introduced a dome built of glass blocks. At the Columbian Exposition in Chicago in 1893 he was architect of the Manufactures and Liberal Arts Building. In 1904 Post and his sons were architects for the new buildings of the College of the City of New York. Then came the Wisconsin State Capitol. Mr. Post was a leader in advocating zoning and city planning and his ideas in industrial housing are crystallized in the Eclipse Park development, Beloit, Wis.

Post was conspicuous in the development of the typical, modern hotel plan and his firm designed a number of the Statler Hotels and became consultants on many more. He was President of the American Institute of Architects from 1896 to 1899 and was awarded the Institute's gold medal in 1911.

Venice

Since the death of the world of antiquity and after the time of the cathedral, our most powerful symphony of stone is Venice. It unrolls all along the Grand Canal or at the edge of the solitary *rios* where, in the evening, the lanterns pour into the waters of the night their narrow pools of blood; it is in the facades of red and gold and verdigris, whose frescoes are corroded with salt, and above which, over the moldy flight of steps, tiers of colonnettes sprang out of the openwork of the balconies, to join, at the peak of the ogival windows, with the trefoils and the embellishments of the flowers above. In these moments of tremendous vitality the unity which is inherent in man dictates his gestures and ripens his thoughts; between this mingling of water and sky, amid this feverish world in which languages, religions, manners, dress, and blood merge, everything is permitted. . . . The fantastic palaces emerge from the shadowy water like an Oriental night in which story-tellers, on the terraces, evoke the confused piles of milky bulbs and shafts of enamel that sleep in the moonlight. . . .

Fra Giocondo, the Lombardis, Sanmicheli, Sansovino, and Andrea Palladio are transformed in Venice or even discover themselves there, and the architecture of the Italian Renaissance finds in the city a favorable ground for the development of the severe force which sometimes redeems its lack of logic and its decorative fantasies.

—*Elie Faure* in "History of Art: Renaissance."

A glass "cornerstone" containing records has been laid as the foundation block for a Department of Glass Technology at the University of Sheffield, England.

America's famous Statue of Liberty is nearly 50 feet taller than the Colossus of Rhodes—one of the ancient world's seven wonders.

Contributors to this Issue

Carl B. Roden, Chief Librarian for twenty years of the Chicago Public Library System, is a national authority on library function and administration.

Carter Edmund Hewitt, Peoria architect, son of Herbert Hewitt, is a member of the firm of Hewitt, Emerson & Gregg.

L. V. Teesdale is Senior Engineer, Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, Madison, Wis. The Laboratory functions in cooperation with the University of Wisconsin. Mr. Teesdale is an authority on the subject he discusses. Reports made by him are sought far and wide. The Bulletin can testify to this from its own experience. Once a practicing architect in Chicago, Mr. Teesdale has been a member of the Illinois Society of Architects for many years.

Adolph Lonek, Chicago architect, member of the Illinois Society of Architects since 1898, died at his home on December 4, age 74. He was prominent in Czech circles. He was born in Bohemia and graduated from Charles University, Prague. Honored by the late President Masaryk, he was awarded a memorial by the government of Czechoslovakia.

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George B. Helmle, well-known architect of Springfield, Illinois, died there on January 3, age 55. Death resulted from a self-inflicted gunshot wound. Mr. Helmle succeeded his father as architect and designed many of Springfield's conspicuous structures, including Lincoln Hotel and St. John's Hospital. He was architect of numerous Catholic institutional buildings throughout the country. He was a World War veteran and member of the Adventurers' Club of Chicago.

Member of the Illinois Society of Architects since June 1917, he had served on the Public Action, Legislative, State Building Code Committees, was 2nd vice-president, off and on, for ten years, and served the Society in other capacities in Springfield. In 1911-12 he was associated in archaeological studies and excavations in Smyrna.

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Henry J. Schlacks, prominent Chicago architect, member I. S. A. since 1897 and A. I. A. since 1917, died in his home on January 6, age 70, after a protracted illness. Mr. Schlacks, a Chicagoan by birth, received his first architectural training in the office of Adler and Sullivan; then two years at Massachusetts Institute of Technology and after traveling abroad, he returned to Chicago. It was not long before the firm of Schlacks and Ottenheimer, both products of the Adler and Sullivan office, started in practice and produced creditable work.

After some five years of this association, each member practiced alone and Henry J. Schlacks became a conspicuous figure in Catholic institutional architectural practice. In 1898 his St. Paul's R. C. Church at Hoyne avenue and 21st place, Chicago, roused architectural interest throughout the land. It was an ambitious Gothic structure, designed and carried out in burnt clay, the window tracery, the groined arches, with vaults over nave, aisles and transepts,—all constructed of brick and tile. It was the first church in Chicago crowned with masonry vaulting.

In more recent years Mr. Schlacks was architect of St. Martin's Church, St. Mary of the Lake, St. Ita's Church, also St. Boniface School and St. Anthony's Hospital, all in Chicago.

Besides his service as director of the Illinois Society for six years, Mr. Schlacks functioned on the Building Valuations, Legislative, and Legal Service committees.

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Robert B. Harshe, Director of the Art Institute of Chicago, died January 11, age 58 years. He was born in Salisbury, Mo. In 1915 he became director of Oakland, California, public museum. His next appointment was at Pittsburgh where he became assistant director of Carnegie Institute's department of fine arts. In 1920 he became assistant director, Art Institute of Chicago, and in 1921 director.

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John Hanifen, architect, of Ottawa, Illinois, died, age 52, in Presbyterian Hospital, Chicago, on January 12. Recently he functioned as assistant state reconditioning supervisor of HOLC.