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ARCHITECTURE UNDERGROUND

By Alfred Shaw, Architect Consultant, Chicago Subways

The Subway has always been a kind of *Banshee* in Chicago, striking terror into the hearts of property owners, contractors and even some architects and engineers. We heard tales of skyscrapers sliding into holes and of State street bending this way and that, of great masses of soft clay moving into the voids of alleged progress.

There *was* some settling of structures and considerable settling of streets, and certain properties put caissons to rock previous to subway excavation. On the whole, however, the subway was more of a routine performance than most people suspected and the "biscuit cutters" or shields pushed through the clay with comparative ease. The chief troubles encountered were from this high pressure "push" which dislocated utilities and pushed up the floors in basements—the one trouble which no one had predicted.*

It may seem premature before trains are running through it to be writing about the participation of the consulting architects in the design of the Chicago Subway, for the proof of the pudding must, as always, be in the eating. However, some discussion of the *modus operandi* and the problems involved may prove of interest.

From the beginning, following the views of Commissioner Harrington, there were joint meetings. These meetings included (besides Mr. Harrington as the Commissioner of Subways and the P.W.A. committee, Messrs. Waite, D'Esposito and Brinkerhof); the Chief Engineer, Mr. Burke and later Mr. DeLeuw; the Consulting Architect; Major Kelker, Consultant on Transportation; and on certain occasions, Mr. Paul Gerhardt, Jr., City Architect; and Mr. Karl Tertzaghi, Authority on Soil Mechanics; and the representatives of the operating company, chiefly Colonel Blair and Mr. Dwight Smith. From time to time the opinion of men prominent in the construction industry was sought, obtained and digested.

While responsibilities were designated, the subjects discussed—whether traffic, entrance, turnstiles, signs or materials—were tossed around freely and discussion from everyone was encouraged. In this way the solutions were arrived at generally and the subway may be said to be the joint creation of all the participants.

In the early days we inspected the subways in New York, Philadelphia and Boston, as well as (by photographs and reminiscence) those in London, Paris and Moscow. Moscow was far ahead on pretentious decor and marble, but the simple vaults of the London tubes and the glazed arches of the Metro looked as good as ever. The Cambridge tubes in Boston, the Broad Street Subway in Philadelphia and the Brooklyn extensions in New York rated in that order in this country. Also, a bit out of municipal competition, but doubtless better than any, were the suburban facilities of the Pennsylvania R.R. at Broad Street and those of the New York Central in the low level at Grand Central.

After a thorough engineering and transit analysis, the low level, shield-driven tubes were adopted by the P.W.A. and the city's engineers. This low level scheme proposed north and south tubes in State and Dearborn Streets, a surface car (or at least a high-level), east and west future subway system in certain east and west streets.

For this reason, as well as because of the narrowness of the sidewalks on the east and west streets, the sidewalk stairs properly and the sidewalk entrances to them were placed in the middle of the blocks on Dearborn and State Streets and transfer galleries connecting to future east and west subways are planned for.

At this point, it is worthwhile to note that the present subway project is known as the "Initial System of Subways" and is a small part of an eventual citywide plan. It is perhaps less than that, for excepting some few outlying stations, it is just an underground through-terminal for the downtown area at present connected to the areas served by the existing elevated lines. In downtown areas the mezzanine stations occur just below the street in the centers of the blocks and the platforms down at tube level are continuous from Lake to Van Buren Streets. A berthing scheme which has been worked out with the operators places trains to and from the various destinations, always at the same point.

Any architect will, of course, want to know what the present system will do toward the removal of the Elevated Loop. By consulting the Map Supplement hereto dated January, 1942, it will be seen that the extensions in cross-hatching, totaling 1½ miles and $11,000,000.00, beyond present authorization will permit west side trains to use the Underground instead of the Elevated Loop. A sentimental etymological curio—"The Old Loop"—can then disappear. By the same token an alleged economy but an actual disease-spreader will have gone from our midst. The cheapest way can be the cheapest in more ways than one. The human and economic devastation wrought by the elevated structures in our cities is not far behind that of plague and war. The slow cancerous action is not so visible as the scarlet of war but just as deadly. See 6th Avenue in New York and see Wabash Avenue in Chicago as soon as possible.

From the loop sidewalks, the simple open stairs properly "signed" (with temporary war-time welded iron rails) in each block, take the patron to the mezzanine level. The plan forms of the mezzanine are as functional as those of a healthy artery, the traffic being considered like corpuscles moving—at peak periods—in great numbers. The walls by the same token, are designed in tangents and curves of structural glass, for easy flow and because of the obvious clean sheen of this perfect vitreous material.

The floors of the mezzanines are a red composition of the Kalman type. A mechanical scoring in three foot

spacings gives a structural pattern to these floors. The grey structural glass demonstrates how well this material is adapted to fit a curving wall and the non-illuminated signs are block letters, sand blasted into the grey background and darkened for legibility. The ceilings are plywood formed concrete painted a pale green for light reflection. Illuminated mezzanine signs are equipped with green fluorescent tubes as are the sidewalk signs above at street level. The free-standing columns in the mezzanine are covered with slabs of Radio Black Marble rounded at the corners.

At the east and west walls, entrances harmonizing in design with the stations will give access to basements of shops and stores. At Quincy Street and Court Place are pedestrian connections between State and Dearborn Streets.

The turnstiles and fencing in the mezzanines are generally low to keep the "Sing Sing" character at the absolute minimum. Likewise, the agents' booths are all plate glass at eye level and are set in as a piece of furniture. The agents' booths are modern, but are cozy and have heating and ventilating units of their own.

Typical connection from the mezzanines to the tubes and loading platforms below is by two escalators and two stairs at each station. These passages are slanting shafts of black marble contrasting with the white metal of the escalators and lead to the red composition floors of platforms. The stair treads are an abrasive pre-cast tile. The typical platform is 22 feet wide and has an arched central aisle, with the north and south bound loading strips and tracks on either side in tubes about 21 feet in diameter.

All lighting is by fluorescent units. In the tubes particularly, this system gives a natural diffusion, the three structural tubes being illuminated by the tubular units. The platforms are nearly always seen longitudinally and there is as a result no glare because of the dead ends of the tubes cutting down visible light sources. This feature is a convenience to the patron and a safety measure for the train motormen who come to a well-lighted station but have no glare in the direction of the oncoming train.

The structural columns on the platforms are Bethlehem H's. and are uncovered except for painting. Studies and models of aluminum casings were made, but between the material shortage and the honest simplicity of the H section it was decided to show the steel.

Each station will have an obviously different color scheme, which will intentionally supplement the location signs.† Four color schemes, red, blue, green and brown, will occur on succeeding stations in rotation. The colors are worked into the columns, the soffit steel, the signs (illuminated and vitreous), the terra cotta trim and the tints on the vaults.

The limitations of cost and critical war materials have been problems of grave importance. For instance, all the doors, rails in mezzanines and on street entrances, signs and other trim were designed in aluminum instead of iron and steel as built. Many substitutions have been made, but even with W.P.B. cut-downs the public will have in Chicago a subway better than any built in this country to date; as to how much better, that must be their decision.

Although authorized financially by both the Federal and Municipal governments, and although the structures without finish are virtually complete, the operation and finish of the Dearborn Street tubes are deferred until after Victory. Exposed improvements, vulnerable from the elements, have been carefully boxed up.

The gross amount of money in finish as differentiated from structure is so small that even more expensive finish than we have contrived would be justified. Not the movie palace decor of Moscow, but the use of better and better materials. To avoid shocking, by too much expense, a public used to ugly, noisy, unlighted subways, we have been circumspect; that we have contrived some improvement over earlier subways is due to the unity of action of the architects and engineers. The patron can only be intrigued into using these facilities as they may afford some visual, sensual, psychological convenience. See, for example, streamline trains, good highways, automobiles and the rest. These transportation systems besides being public utilities must have some basis in economics and of the two methods: "Make them miserable and cut the volume," or "Make them happy and raise the volume," the latter has been the guiding influence in the Commissioner's Committee. In this and other constructive, broad approaches the City is lucky to have a person of Mr. Harrington's character at the helm.

In our recommendations we looked, in form and materials, for orderliness, simplicity, light reflection and vitreous surfaces. We considered that the subway should be a pleasant thing to be in and use and to do its part by convenience and pleasure in the "selling" of transportation. In this attitude we were generally successful. Transit that is merely "rapid"—a misery to be endured between pleasures, work or other miseries—is a failure in the human scheme and need not be. If the public considers that we have made any progress in these directions, let us hope it will make them hungry for more—not only in subways, but in our streets, our factories and our cities in general.

**This trouble was relieved by instructions from the Chief Engineer to slow down the advance of the shield.*

†For easier recognition by the habitual patron.

Concrete with the Romans

From an engineering standpoint the Romans made a wonderful discovery in the first century when they learned how to make and use concrete, and their concrete—chiefly derived from a volcanic product found at Pozzuoli, and hence called *pozzolana*—was exceptionally strong. It enabled them to build cheaply and rapidly on a vast scale and to erect any class of building chiefly by means of unskilled labour. The Roman, as Ruskin has said, "went in for a cheap and easy way of doing that whose difficulty was its chief honour."

In a Greek building every part did the work which it was supposed to do, and which it appeared to do. There was "no deception." In a Roman building we are never sure. That is why Roman buildings lack the winning simplicity of the Greek. To be simple we must be truthful; when we set out to be "clever" we may easily fall into deceit. The Romans had a saying, *splendide mendax* (splendidly untruthful), and they illustrated it in their buildings.

—Frank Rutter

Philip Harrington, Commissioner, Department of Subways and Super-highways, has announced that Chicago's new subway will have cars operating through it early in 1943. The Bulletin takes pleasure in presenting to its readers in this issue an authoritative article on the design and materials used in the construction of subway passenger stations after a study of the experiences in various cities where subways operate. The writer, Mr. Alfred Shaw, is of the firm Shaw, Naess & Murphy, consulting architects to the Subway Commission. These architects reported on planning, materials proposed, submitted models, recommended lighting and decoration and whatever falls within the province of the architect.

Officially, the now built subway is to have extensions to the north, west, and south and the Department of Subways has prepared plans for extensions. The city has, in fact, begun buying up property to permit the breaking through of Congress Street which is planned to have a subway extension. It should be borne in mind, however, that discussion of a subway in Chicago is an old, old story; that had not Uncle Sam agreed in 1939 through a P.W.A. grant to supply 45% of the total cost of the State Street and Dearborn Street subways, we would not be discussing subways here.

In 1939 contracts were let to the total amount of $31,555,994.50. This was for a subway length of 35,851 feet. By January 1, 1942, $43,711,481.58 had been expended on subway construction. Of this sum $32,000,000 came from the Traction Fund, the balance from the Federal Grant. To date $58,000,000 has been spent on the subway, of which $35,000,000 was advanced by the city and the rest by the Federal Works Agency. Before the two subways are completed their total cost is expected to be 63 to 65 millions.

Digging this subway has caused the razing and removal of a considerable number of important early downtown high buildings, all built on floating foundations. Among these were Great Northern Hotel, Temple Court building, Bedford building, all three fronting on Dearborn Street facing the Federal building; also the famous Masonic Temple of 1893 at State and Randolph Streets. Such foundations generally started at a level of fourteen to sixteen feet below street grade. This street grade is about ten feet above the natural soil level of 1837 when the city's charter was granted. The grade was first raised in the 1850's and twice after that, the last occurring in 1872-73 following the Great Chicago Fire. Rock is not encountered before reaching a depth of approximately 100 feet below street grade in the downtown area.

So, jeopardized foundations to important buildings played an important part in the discussion, retarding the commencement of a subway from 1907, when subway discussion became active in the Chicago Common Council, until October, 1938, when the Federal Government agreed to contribute $18,000,000 to the city's $28,000,000 specific subway construction. Since then the cost has increased to the amount stated above.

The present subway contemplates partial relief to elevated train passengers in that certain elevated trains will be carried through the subway tubes, thus relieving the surface pressure. Surface cars and busses will not be affected by subway trains beyond eliminating surface crowding. The gain the present subway achieves is in the saving of time by eliminating blockage of surface traffic.

Echoes of the Bulletin's discussion of the "new architecture" appearing in the October-November, '42 Bulletin, resound with Charles D. Maginnis' masterly English in his exposition of this subject as presented in his paper at the Greek Theater in Cranbrook during the A.I.A. national meeting at Detroit.

Students of architecture and architectural history, both architects and non-architects, are impressed with Mr. Maginnis' penetrating use of the word ARID. Such a sentence as "The fates have been kind to the cult of the arid, for war has now dramatically carried to it a plausibility for which it might have waited long." How true!

No one would condemn all modern efforts. For there are shining examples such as the exterior of the Folger Shakespeare Library in Washington, D. C. by architect Paul P. Cret which has spirit, daring, modernity, and beauty. But perhaps Mr. Keck would not include the Folger Library among modern works since it has stood more than ten years.

Mr. Maginnis is perhaps the most gifted among American architects in the use of English that is subtle, charming, and powerful. He should write more in order that his confrères might learn from him the art of expressing themselves in masterly English.

We note that the first of a series of joint dinner meetings of the New York Chapter, A.I.A. and the Architectural League featured Sir Ernest Simon who talked on post-war rebuilding of London. He showed an exhibition of Blitzed London architecture and hoped the complete rebuilding would be done in one generation. Sir Ernest noted TVA's community planning, calling it "the result no doubt of our possibly over-zealous landscape architects." Sir Ernest piques our curiosity! Will someone tell us more in detail where the TVA landscapist has overshot the mark?

Said Robert Kohn to Albert Kahn,
"How do you like the Parthenon?"
Said Albert Kahn to Robert Kohn,
"The things I like are all my own."

—Louis LaBeaume

The Chicago Chapter, A.I.A., announces that the Chapter December meeting will be held at the Tavern Club on Tuesday, the 15th. Arrangements are under way to make this a Past-Presidents' Night.

October and November Illinois Society Meetings

It was on Tuesday, October 27 that 34 men assembled in Central Y.M.C.A., Chicago, to attend the regular monthly meeting of the Illinois Society of Architects. The dinner was good and inexpensive.

Then President Ryan announced that the program of the evening would come first and introduced Messrs. J. C. Kazimier, Product Development Engineer, and J. P. Cunningham, specialists in plastics. The latter two announced the presentation of a motion and sound film "The World of Plastics" after which they would answer any questions the company might put.

The film was kodachrome, beautiful in color if somewhat hoary with age or wear, the sound film somewhat trying for the ear, possibly through age but certainly through the accompanying music (?) which interfered with the ready understanding of the voice.

The picture carried the observer from first principles, that is, mixture of crude materials, the paste, the foam, the packing into molds producing beautiful trinkets and gadgets, the passing through presses producing sheets like paper, and many other products, not to forget raincoats, covers for upholstered furniture, counter tops, wall surfacing—everything almost except floor covering. Into this latter field the men of plastics have not yet dared to enter. It was all interesting and piqued the minds of hearers to shoot questions at Mr. Kazimier who now appeared bravely ready to answer.

Some questions on fundamentals, particularly touching on chemistry, he refused to answer. He said, however, that the beginning of plastics was with Dr. Baekeland, a Holland scientist, operating in Paris. From then on Mr. Kazimier's story was confined entirely to the U.S.A. He was cautious to answer no questions that might in any way encroach upon plastic products now made for the U. S. armed forces.

President Ryan closed part 1 — Plastics — with a few graceful words to the speakers and proceeded with the Society's business meeting. Secretary Fuhrer read the minutes of the September meeting. Little new correspondence was brought out and the President proceeded to call for committee reports. He got a few. Benjamin F. Olson reported for Legislative committee, Woltersdorf for Publicity and the Bulletin, Weissenborn for Entertainment, dwelling on plans for the November meeting and the next following in January, '43; but Urbanek for Public Action, Schreiber for Building Valuations, Larson for Housing, all called upon, had nothing to report.

Mr. J. B. Maylard of the Chicago HOLC office was questioned on his bureau's action on the conversion of older homes into small apartments with Government funds. In answering, he brought out the connection of the NHA with this work. He said that the rules required turning back these properties to original owners in seven years, two years after the Peace. This brought the question from the floor whether the Government is expecting the war to last five years. Mr. Maylard invited hearers to call on him in his office in the Merchandise Mart for further particulars.

Mr. Olson read a letter received from C. Herrick Hammond, Illinois State Architect, on classification of architects according to the State law definition that only draftsmen and superintendents holding a State license had a right to use the designation architect with their names. George M. Nedved, Joseph Booton and others spoke on the proposed changes in the Illinois Architects' law and urged that consensus of opinion for any changes in that law be digested, put in writing, and forwarded to the proper legislative committee as soon as possible if new action is hoped for since the new State Legislature is called to meet on Monday, January 4, 1943.

There was a discussion of the A.I.A.'s appeal for financial support for maintaining a Washington representative whose function is to gather information from Government departments and bureaus for employment of architects, after which the meeting adjourned.

In November the Society and the Chicago Chapter held a joint meeting November 10, described on page 5 in this issue.

The Army and Navy Munitions Board, which is the court of last resort in such matters, has been bothered by having to adjudicate requests for critical materials which should have been stopped at source. *The architects do not contribute to an impression of efficiency or of useful contribution to the war effort by failing to observe these admonitions.*

—D. K. Este Fisher, Jr.
Washington Representative, A.I.A.

Professorial Opinion

The architectural profession is a numerically unimportant part of the building industry. The profession has no such numbers as the legal, medical, and engineering professions nor does it command the respect that they do, particularly in war time. The industry of which we are a part is under continual criticism as being backward, disorganized, inefficient, and suffering from monopoly, collusion, and rackets. The architect's present influence is so small as compared with other dominant groups that he is not likely to be important as an "architect-leader-citizen," as a leader for a "better society," a "humane civilization," "social gains," or for a world relieved from "fear of want." We had better do our part of the job so well that the public will respect architecture as a profession and building as an industry.

Our own job now is to co-operate at once with all other elements in the whole industry, we to furnish definite specifications for physical planning for urban rehabilitation when the peace comes.

—Charles W. Killam, Professor Emeritus
Harvard U. School of Architecture

Reply: I recommend to Mr. Killam Mr. Charles Ascher's "Better Cities," published this year by the National Resources Planning Board. This might be called an Atlantic Charter for urban planning and sets up plenty of goals to shoot at. I thoroughly agree with Mr. Killam's paragraph on the need of architects to acquaint themselves with civic problems. Some of us have been urging this for years and have been attempting to interest the architect in what has been considered by the profession as extra curricular. I would recommend that if Mr. Killam really wants to study standards he acquaint himself with the standards established by the Committee on Hygiene of Houses of the American Health Association. These are, in my opinion, the best standards which have so far been set up scientifically by any institution in an attempt to reach working criteria on architectural design and community planning as it relates to residential areas. More of this kind of study is needed.

That the planners are not ready is no indictment of them. That the country is not ready to accept planning is an indictment of our profession, our technical men, of our citizenry at large. If the material for planning is not ready at this time it is not because the planners have not tried to prepare it. Mr. Killam will find, in any good planning library, the evidence that planners have long been working on the subjects he worries about.

—Carl Feiss, Assistant Professor
Columbia U. School of Architecture
—From September '42 Pencil Points

New Building Concepts

Because of its unprecedented size and shape, and its use of ramps for movement of pedestrians the War Department's huge new Pentagon Building is of peculiar interest to the architect and building designer. Being the world's largest building and spreading its 4,000,000 square feet on only five floors, it raises the question of practicality — of whether large office buildings of low height are economical and efficient. Equally as important as the question of size is that of general layout and space arrangement. A five-sided structure in which the offices occur in concentric rings seemed to offer many advantages to the designers of the Pentagon Building, but the proof remains to be established from operating experience. Likewise to employ ramps for pedestrian movement from floor to floor is an innovation that will be watched with interest; in the portions of the Pentagon Building already in service, the ramps are said to be exhibiting many advantages over elevators and stairs. In all these particulars the Pentagon Building is as daring as it is huge. Its designers have done a pioneering job which may have important effects on post-war buildings. From the start, Lieut. Col. Clarence Renshaw has been officer in charge and G. Edwin Bergstrom and David J. Witmer chief architects.

—Editorial, "Engineering News Record"

In 1841 the first fire brick was developed; in 1843 Joule discovered British Thermal Units.

Chicago Chapter October and November Meetings

The Chicago Chapter, A.I.A. assembled to the number of about forty in the Tavern Club on October 13. Dinner was served in the Henry VIII room where the business meeting and program followed.

President Nathaniel Owings, in extending welcome, presented, as special guests, Peter Brust, Illinois-Wisconsin A.I.A. regional director, and Leigh Hunt of the Institute's Committee on Unification, both from Milwaukee. Mr. Brust was given the floor. He spoke particularly about financial conditions in the Institute nationally. Its income has been so seriously reduced that it carries on its work with great difficulty. Many revenues have disappeared. The sale of contract and other forms has dwindled by thousands of dollars. The dues of certain classes of junior members have been reduced to as low as $5.00 per annum. Mr. Brust asked that the Chapter tax each member $2.00 and forward the sum to the Institute at Washington.

Mr. Owings had little Chapter business to present, particularly since Secretary Suter was absent from the city. There were no minutes read. A communication from the Ryerson and Burnham Libraries in the Art Institute had been received by the Chapter, requesting gift books on architecture, construction, and town planning for war prisoners. A more detailed report of the libraries' request is published elsewhere in this issue. The President had something to say in answer to those who are continually voicing their opinion that the architect, as a professional man, is disappearing below the horizon. He took exception to this view and stated that every Government contract today for building projects was an architect—engineer—builder contract, with the architect leading the procession.

Professor Louis Wirth of the Department of Sociology, University of Chicago, Consultant to the National Resources Planning Board, was introduced as the speaker of the evening. His subject was "Post War Planning." This subject of post war planning is now constantly on one's lips, constantly thrust before one's eyes in the daily press, and, no doubt, used today politically and otherwise, often to befuddle the public mind. Anyway that was the subject we had come to hear Dr. Wirth discuss and found him interesting—perhaps more interesting than completely convincing.

His address began with a word picture of social conditions surrounding us today and he maintained that Social Organization was THE problem today. One could hardly call his parade of conditions today "the progress of civilization" for he proposed, in the interest of a new home for the human spirit, upsetting many ideas of town planning, housing, parks and playgrounds, and the like.

He dwelt long on the future city and called for thorough planning, planning that, he said, did not exist in American cities today. The Burnham Plan of Chicago, at least as far as carried out, is a veneer along the lake front with here and there, pleasant green spots meant to impress the visitor. The approach from the lake to the city is pretty, but whoever approaches the city from the lake! Visitors come by railroad through dilapidated, tumble-down, slummy sections. The green spots he did not value much, calling them places for bums and hobos to loiter and sleep.

Of Boston he said that it was a city whose plan was made by a cow, for the principle downtown streets had, it is true, been, originally, cow paths. Housing he said was not a problem. What must be achieved is sufficient floor space per unit of family dwelling regardless of how many stories may be piled up on the land. Chicago's Gold Coast he said, was more densely populated than the near west side's dilapidated slum neighborhoods. Housing in the future would not be the building of individual homes by individual owners having small parcels of land but would be carried on at wholesale and manufactured and distributed as is the automobile and the sewing machine.

He voiced dissatisfaction with the independent property owner who hopes and figures on a rise in his real estate through added population. He cried: "Who owns land anyway? Has it not always been a question of usurpation?" He would have it made easy for the State and Federal Government to take land, where, in its judgment, it would benefit the community, by a much easier process than exists today. Building codes and ordinances, he pronounced all an abomination honestly observed by no one and no one could carry out their edicts even if he wanted to. Mr. Wirth would have one building code, applicable anywhere and everywhere in the land, written by some bureau of standards.

Mr. Wirth says what we need is a new concept of self government. He brought his neo-liberal views to a dramatic climax with: "We are not going back to the status-quo." Some questions were put to the speaker by Messrs. Holsman, Grunsfeld, Cromelin, Loebl and others which the speaker answered, following which the meeting was adjourned.

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On November 10, 110 architects (two of these from Milwaukee) responded to notices of a joint meeting of the Chicago Chapter, A.I.A. and the Illinois Society of Architects at Great Lakes Naval Training Station. This was passing along Captain R. D. Spalding's invitation to the membership.

At 2:50 P.M. three Navy busses deposited the architects at Bachelor Officer's Quarters, Great Lakes N.T.S., where they were welcomed in the large reception room by Captain Spalding who, standing by the fireplace, explained on a map what the visitors would be shown and what would be omitted.

Then under the guidance of younger naval officers, one to each bus, the cavalcade proceeded to the Mess Hall, thence to the Recreation Center, then passing Warrant Officers Quarters through Camp Barry gate to Camp Moffett. Here barracks were inspected, a huge drill hall, dispensary; then back into busses for a drive to other barracks. A short walk brought the company to Reception Center.

From here the party was transported by bus to Ross Auditorium, a permanent building that might be described as a fine music hall with a podium for a symphony orchestra, organ and a movie screen. Captain Spalding explained that it is regularly used for chapel and that on the evening of our visit the Auditorium would present a program by the Naval Station Symphony in accompaniment of Lawrence Tibbett, the opera singer. Features of Ross Auditorium are a shallow balcony, comfortable opera chairs, orchestra pit, wide center aisle for transporting caskets down it during funeral ceremonies, and a handsome foyer with two memorial tablets of stainless steel with pictorial color-decoration and dedication, one each to Rear Admiral John Downes, the other to Captain R. D. Spalding. The hall seats 1800.

The next and final stop was at Officer's Club Building No. 93, where dinner was to be served. All in all, it was an interesting and instructive afternoon session with demonstrations given in mess halls and barracks and questions answered. The architects had an opportunity of seeing the effect of order and kindly discipline on the deportment and attention of men in uniform. So on arriving at the club, the architects were a happy though a somewhat tired group, glad of comfortable seats in the lounge before proceeding to the dining room where, at 6:45, dinner was served. It was an excellent dinner and conversation flowed. At the end the architects' good friend, Captain R. D. Spalding, took the floor expressing his pleasure at being able to welcome the architects to the largest naval training station in the world where, with the archiects' help, many great buildings had been erected and put to use in an incredibly short time, particularly, since December 7, '41.

Before adjourning Paul Gerhardt, Jr., Vice President Chicago Chapter, in the absence of Nathaniel Owings, President, introduced all those at the speakers' table and in a few graceful sentences assured Captain Spalding and his officers and men of our sincere appreciation and thanks for a most memorable afternoon spent at Great Lakes.

Dollar a Year Men in Government

Specialists from industry who are lending their services to the Government must go through about the same routine as a $1440-a-year Civil Service clerk, says *Nation's Business*. In the first place they must be sent for, and the Government never calls upon them if the post can be filled by a paid employee.

After being appointed he is finger printed, takes the oath of office, and is given a course of indoctrination—in other words, a good talking-to about government service and the job he is expected to do. Then he is turned loose to work from 10 to 16 hours a day.

The country should be grateful, you are saying, to these 500 or so experts, doing their jobs without compensation. But it's more abusive than grateful. Millions of people have been led by politicians and left-wing typewriter pundits to think of dollar-a-year men as

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Preventing Basement Flooding in Chicago

I.S.A. Bulletin Editor: The Bureau of Sewers of this department has received hundreds of complaints of flooded basements during this unusually wet spring and summer.

Investigation discloses that many of these come from moderate to high cost single family houses and that a large proportion are of the popular "close-to-the-ground" style of architecture with basement recreation rooms, well fitted and furnished. Such basements being a far greater risk than the older type, which was used only for storage, laundry and heating plant, impose a greater obligation on the architect to be informed as to the danger of backwater. This is the more true, because such designs call for more head room in basements than formerly.

Two factors operate separately to depress basement floor levels:

1. The increased head room.
2. The "low-down" flat architecture.

The more expensive furnishings merely aggravate the damage when it occurs.

Early sewer planners thought they planned generously but frequently those plans were trimmed because financing for property development would not stand the cost of building sewers for 30 or 40 years ahead.

Fixing the blame, however, does not alter the conditions. This latter is being accomplished slowly and whenever money is available for the purpose, whether by assessments or by public funds. From 1912 to 1932 over $12,000,000 worth of reconstruction was accomplished. Under W.P.A. auspices, from 1935 to 1941, even more was spent and several large projects were begun only to be stopped when funds were exhausted.

If Chicago will adopt a "service charge" for all sewer installation, new and existing, as Detroit and many other towns and cities have done, further funds will gradually become available for maintaining sewers and for correcting some of the inadequacy. Until general remedies may be found or applied, members of your profession should at least avail themselves of the experience of the sewer engineers in City service whose advice might save much annoyance and expense to many house builders. We feel they should also modify the floor elevations of the "close-to-the-ground" style when used, perhaps concealing the extra height in some way so that basement floors may be higher.

It is not enough to inquire merely as to the size and depth of sewer at a given location, since sewers of any size or depth may be subject to high water or may not. But in any case the Bureau of Sewers will be glad to advise with the architects to the extent of their information.

—O. E. Hewitt, Commissioner of Public Works

Chicago, October 19, 1942

In re — The Bulbous Dome

The Editor: Professor Laing's dissertation on the "Onion Dome" was as wise and convincing as one would expect from a well known scholar. According to the spirit of our time, it stresses functionalism. This is the more natural the nearer one stands to an art. For it is then that one can appreciate its function best. (I assume, therefore, that the Professor is fond of doughnuts also!) My relations with architecture are, I am sorry to say, of the more ephemeral kind; a lover and admirer from a distance, trying to grasp a little of what the building has to say to us.

In this respect the bulbous dome seems to me—following Professor Laing's erudite remarks—a reminder of our great oriental legacy in architecture. We have often neglected this legacy in our studies in general, as Houston Steward Chamberlain's book "The Foundation of the XIXth Century" has inversely demonstrated. In Europe one is still to a certain degree under the spell of the crusading spirit: what good can come from the heretics! And yet, we know that the Gothic style owes its birth to the interaction of French architects and the spirit of the builders of the Cathedral at Cordova and the Alhambra, and that even the troubadour spirit had much in common with the love stories in the Arabian Nights. It was very gratifying that the late Professor Henri Pirenne in his book "Mohammed and Charlemagne" (1939) should have refreshed our memories of these things.

I believe with Professor Laing that such an interaction between the Occident and the Orient is also behind the secret of the birth of the beautiful onion cupola. The return to Winklemann's Roman models, to Palladio and to Chinese decorations was a sign of the exhausted source of the Baroque. It is not surprising that an eclecticism which we are accustomed to call Rococo came about. The choice of the onion cupola seems to belong to this same process of eclecticism.

This Oriental "decoration" was the more welcome because it relieved the burden of the seriousness of the Gothic legacy. From the time of Montaigne men were fed up with the "vale of tears" and were "out for" earthly happiness. The American Constitution finally guaranteed the pursuit of happiness to everyone.

This change from transcendental to earthly happiness seems especially well exemplified by the Frauenkirche in Munich. For all of its very serious Gothic style, it expresses near-gayety with its onion bulb, like a carnival cap on its head. This was done, if I remember correctly, in the first part of the XVIIIth century. The same longing for happiness built Dominicus Zimmermann's gay and lovely Bavarian church "Auf der Wies." It brought the onion cap to Western Europe, as I believe, without a detour over Russia where Rinaldi, Rastrelli and Dellamotte were still importing Western art.

Russian architecture was orientalized by the Norman Varangians, as Professor Laing says. But I believe that this march of oriental art to the North-East led into a blind alley and that it did not come to the West from there. It seems to me, the "cap" came directly from the Orient to the West when the Turks made themselves felt so terrifically in their attacks on Europe and by threatening Vienna in support of Louis XIV's aggression against war-weakened Germany in Alsace and the Palatinate during the 1680's. The Orient was then taken very seriously again.

—Dr. (Rer. Pol.) Hugo Ferdinand Simon

Russian Holy Trinity Cathedral

The Editor: The newspaper accounts of the recent celebrations held at Russian Holy Trinity Cathedral (St. Trinity Russian Church), Chicago, to celebrate its 50th anniversary failed to mention that Louis Sullivan was the architect of the present church structure.

The Burnham Library has recently received as a gift, a volume of the copies of business letters of Louis Sullivan from 1903-1905. One of the letters dated August 27, 1903 acknowledges payment for professional services for the building of this church.

We also have a rendering of the church as Louis Sullivan envisioned it but the ornamentation of the exterior has never been completed as he wished.

Hugh Morrison who wrote "Louis Sullivan, Prophet of Modern Architecture" was not aware of Sullivan's connection with this church and we find that very few people do know it—so your readers may be interested.

—The Burnham Library of Architecture

Who knows what the post war era will do to business organization? Will the Government be a permanent competitor? What new *ism* may sneak up behind us? A few business men are convinced that the only thing which will save them from a sad fate is public opinion. To them, their main chance of survival lies in keeping their house flags waving.

Sociologists anticipate development of many "isms;" plausible panaceas will be proposed to cure economic ills. If business is to retain its relatively free position, it must keep as close contact with the public as the most astute politician maintains with his voters.

—Bulletin, H.P. & A.C.C.N.A.

On Acoustics; The auditorium of Orchestra Hall is so constructed that one often hears the reflection of a sound, louder than the original and from a different direction. During the first movement of the Shostakovich Seventh symphony the violins carry an almost inaudible theme to the accompaniment of a snare drum. It was during the first few bars of this passage Thursday night that a dignified dowager turned to those behind her and said, "I do wish whoever is making that noise would stop so the rest of us can hear the music."

—Marcia Winn

Gift Books to War Prisoners' Aid

Miss Etheldred Abbot, librarian of Ryerson and Burnham Libraries, in the Chicago Art Institute, offers the libraries' assistance in forwarding books on architecture and town planning to "Men of Science—Prisoners of War" administered by the War Prisoners' Aid of the Y.M.C.A.

War Prisoners' Aid submitted a list of twenty-one titles desired beginning with Hool, two volumes, "Handbook of Building Construction" and ending with Henry Wright on "Rehousing Urban America." The Ryerson and Burnham libraries forward contributions to Paul B. Anderson of the War Prisoners' Aid in New York. Other books on architecture and town planning, destined for War Prisoners' Aid, the libraries would send to Mr. R. D. Jameson, Technical Advisor, Library of Congress Annex, Washington, D. C. Mr. Jameson's staff must check them for censorship.

Persons willing to give books to War Prisoners' Aid will be furnished the complete list of twenty-one titles asked for by applying to Miss Abbot at the Art Institute.

Provision for Freight and Express Planes

The vision of expanding interest in air freight is just beginning to loom over the horizon. And what about the rising curve of air express? What about the 200,000 or more pilots who will be trained? What about the gigantic plane building facilities we shall have with us after the war? What about the rapid growth of private initiative and interest directed at planes? The measure of these things we must know, so that we can plan to provide for them. The helicopter, that rises and descends vertically and can hover, exists. Its commercialization must wait because it has no apparent present military value. Nevertheless, it works. Another interesting airplane has wings that fold back flat to the fusilage, and gears that engage the rubber-tired wheels so that it can be driven from garage to airfield and then flown into the sky to a possible dinner or business engagement, say some 300 miles away. This generation will see a widespread use of air freight and express, mass and private passenger transportation, to an amazing extent. Let Chicago prepare for this by providing plans for necessary airports.

—T. T. McCrosky, Executive Director, Chicago Plan Commission

British "Turtle-Back" Hangar

A "TURTLE-BACK" hangar, that can be set up quickly and is rapidly and easily concealed from enemy air observation, is the product of two English inventors, W. C. Inman of London and G. R. Dawbarn of Woking, and is protected by U. S. patent.

Framework of the hangar consists of a series of wide, arching ribs, coming down flush with the ground at the ends. When covered with any suitable roofing material, this forms a vaulted structure, the main body of the building. For pursuit planes and other small craft, the ribs can be built of trussed wooden members; for larger planes construction would be of metal.

The blending of the sides with the earth eliminates telltale shadows at the sides. Similar shadow elimination is accomplished by closing the ends with gradual slopes of canvas or other material.

—Science News Letter

Olin Hall of Chemical Engineering at Cornell University has a novel plan. There is a three story wing where students may design, construct, and test manufacturing units large enough to give an accurate idea of the factors involved in full scale production. Except for operating platforms, the three story space is unobstructed. There is a traveling crane.

There are a few classrooms but many small laboratories. Professor Rhodes, in charge, believes the arrangement redounds to responsibility and initiative in creative work on the part of students. Olin Hall is the largest building on the campus, a gift of Franklin W. Olin of Alton, Ill. The architects were Shreve, Lamb & Harmon.

Doc: "Have you told Mr Brown that he's the father of twins?"
Nurse: "Not yet. He's shaving."

Early Chicago and the Illinois and Michigan Canal

Chicago, in 1829, was a small settlement of fur traders living in a few cabins grouped about the second Fort Dearborn. The county seat was Peoria and the balance of the State to the north, except for Galena, was the domain of Black Hawk's Sacs and Foxes and virgin "Federal Lands." Suddenly, in 1830, a great development descended upon northeastern Illinois like a cloudburst. Chicago was marked off into streets and alleys and was the scene of wild speculation. The following year Cook and LaSalle Counties were formed and during the next four years their combined populations jumped from less than 1,000 to over 20,000. The story behind the quick transformation of this wilderness to a settled and prosperous community and the force that started Chicago on its way to being the great Metropolis of the Mississippi Valley was the building of the Illinois and Michigan Canal.

Illinois had at last decided to build a canal connecting the Illinois River and Lake Michigan. Previously in 1827, the Federal Government granted to Illinois 284,000 acres bordering the Illinois, Des Plaines and Chicago Rivers from what is now LaSalle to Lake Michigan. These "canal lands" were to be divided into cities, towns and farms, then sold to pay for the canal. In the spring of 1830 Chicago was platted as the eastern canal terminal. The streets from Madison to Kinzie and from State to Halsted date back to this early survey by James Thompson of May 4, 1830, as ordered by the Canal Commissioners. Actual canal construction finally got underway in 1836.

This historic canal should be of extreme interest to architects interested in Chicago and its vicinity. As an engineering problem and a construction undertaking, it ranks with many of our great modern improvements considering the early date, virgin country and primitive equipment. Early reports of the Canal Commissioners, and the estimates, calculations and records of Mr. William Gooding, Chief Engineer, are as fascinating as any novel.

The numerous roads bordering and crossing the canal permit us to study it as it exists today and brings out the achievement in a forceful manner. One can visualize how the two pumps at Bridgeport (27th and Ashland) where the canal joined the south branch of the Chicago River, supplied the water over the "Summit" until the Calumet feeder was reached. These two sources supplied the necessary water until augmented by the Des Plaines which was crossed through dammed water near Jackson Street, Joliet.

One can drive along the tow path at Willow Springs, Lemont and Lockport. The lock ruins there unfailingly conjure up scenes of the past. After one has read the story of the trials and tribulations encountered, the chunks of limestone on the spoil bank along the "Summit" seem vital and something more than inert masses as they rest today exactly where thrown one hundred years ago. This little "ditch," or so it seemed before, suddenly becomes a noble cut, straight, true, and with purpose. Modern improvements have swallowed up the old canal site through Joliet but one can pick it up again at the modern Brandon locks and follow it, at intervals, as it swings westward through open country and finally curves southward to cross the DuPage River at Channahon. From this point to Morris and LaSalle it follows the Des Plaines and Illinois Rivers and the State of Illinois has preserved portions of it as a series of State Parks. Locks, dams and aqueducts have been restored and one can study canal construction and design technique first hand. Here we can see how streams were crossed, how the canal was fed and how the locks operate.

The canal, as it passes the Dresden Heights, is breathtaking in beauty. In the fall, the tree bordered ribbon of molten gold is a sight never to be forgotten. It was 60′ wide at the surfaces and 36′ wide at the bottom. The normal draft was 4′8″ and the barges carried 97 tons each. Its locks were 18′ wide and 110′ long. The canal was finally completed in 1848 and by that time Chicago was a growing city of about 30,000. For six years it operated without competition. In 1854 the Rock Island and LaSalle Railroad was chartered to act as a feeder and due to a blunder of the Canal Commissioners it was allowed to extend its lines to Chicago and Peoria. Thus the canal had a competitor. It continued to serve, however, and in 1866 had its greatest year. Although doomed as a major carrier its force was evident in the low rates of the Rock Island lines.

In 1892 the Federal Government began the larger "Hennepin" Canal from Bureau to Rock Island and it was evident that the

Illinois and Michigan Canal was too small. Many believed the waterway connecting the Lake and the Mississippi must not be permitted to cease operations. Chicago's sewage problems were now becoming serious so rather than enlarge the canal as the original engineers had planned, the Sanitary and Ship canal was built and opened for service in 1900. However, our little canal continued to operate until shortly after 1915.

The canal cost slightly more than $8,600,000, of which almost $6,000,000 was spent on the 34 mile eastern section to Summit. More than $11,000,000 were audited by the Canal Commissioners and at the close of its operation a tidy sum was turned over as profit. In terms of tolls and canal revenue it was never a huge success, but when one considers its influence on the State's development, particularly Chicago, its value is beyond numerical terms and its construction vindicated its early proponents. Thus Chicago had its beginning in the thread of silver, leading from the Lake to the far off Indian country and the Illinois River and (together with the Erie Canal across New York State) linked the Atlantic Ocean with the Gulf of Mexico.

—Joseph F. Booton, Chief of Design
Division of Architecture and Engineering, State of Illinois

World's Largest Water Treatment Plant

At 79th Street and Lake Michigan the City of Chicago has been, for the last few years, building the largest water filtration plant in the world. Its architectural composition and finish has not been overlooked in its four large buildings—low-lift pumping station, chemical building, filter housing and administration building.

The chemical building contains chemical storage bins and three large chemical pneumatic receivers. The latter are housed in penthouse grouping rising 75 feet above grade level. Two smaller buildings house a control laboratory and a lobby tied together by terrace walls.

The administration and filter buildings form a second group separated from the first by a grassed and terraced settling basin.

A washwater tank tower dominates the entire group of buildings. Interiors are of terra cotta and salt glazed tile. Light for the filter-operating plant galleries comes from a clerestory. To overcome condensation, glass block is used.

Sculpture is used in the form of bas-relief over the entrance door and there is a free-standing sculptured figure serving as a counterpoint to the composition. The texture of the walls, produced by a deep shot finish to the stone, laid in a modular system, gives a crisp, clean appearance.

W. W. DeBerard, Loran D. Gayton, A. E. Gorman, Alfred W. Marshall are the design engineers; also, O. B. Carlisle, substructure engineer, and William F. Martin, senior filtration engineer. Architectural design was under the direction of Paul Gerhardt, Jr., city architect.

Highest award in the field of engineering, the John Fritz Medal for 1943, will be presented to Dr. Willis Rodney Whitney, director emeritus, General Electric Company's research laboratories, and nonresident professor of chemical research of the Massachusetts Institute of Technology. The medal will be awarded Dr. Whitney for "distinguished research" and for "co-ordinating pure science with the service of society through industry."

Dr. Sigfried Giedion spoke at the Detroit Institute of Arts, Thursday, October 15. His subject was "The Changing Aspects of Comfort—Gothic, Baroque, Modern." The Doctor treated his subject from the standpoint of its social and spiritual, as well as its constructive elements. Dr. Giedion has in preparation a book dealing with the influence of mechanization on our lives.

Tarpon Springs, Florida, now the largest sponge market in the world, is much like old Greece; it retains the customs of the people and the Byzantine architecture of the Greek Church. Fishing boats are replicas of the small colorful sailing boats used for centuries in Greece.

Professor Provine of the University of Illinois was elected Vice-President of the Association of the Collegiate Schools of Architecture at the Detroit Convention. He is continuing his work as consultant for the National Board of Fire Underwriters in revising their building code.

Explosive rivets are much used in airplane and other construction where it is impossible to get at the other side of the structure to back the rivet. The explosion forms the head on the far end. In heating the heat must be applied only to the rivets, which are often no more than one-quarter inch in diameter, and the heat must be carefully regulated. If the adjacent metal is heated, it will expand and the joint will not be tight.

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industrialists wangling fat contracts for their companies. It is a positive liability to a corporation when one of its men is so picked.

All contracts, in fact, are placed by the War and Navy departments. No dollar-a-year man, by official order, may "make determinations directly affecting the affairs of the firm or company in which he is employed." But the fiction that they are in Washington for ulterior purposes has been accepted and abuse continues to be these men's compensation.

Ralph Adams Cram, foremost ecclesiastical architect in this country during his later life, died in a hospital in Boston, Mass. after two weeks' illness, on September 22, age 79. Mr. Cram was born in Hampton Falls, N. H. December 16, 1863, the son of a Unitarian minister. His early schooling was at Augusta Me., Westford, Mass., Exeter, N. H. He was honored with degrees by Princeton, Williams, Yale and Notre Dame universities.

In 1889 Cram and Charles Francis Wentworth established their architects' office in Boston under the firm name of Cram & Wentworth. A few years later Bertram Grosvenor Goodhue after having served that firm as draftsman for a short time, became a partner under the firm name of Cram, Wentworth & Goodhue. Mr. Wentworth died after a few years when the firm changed to Cram, Goodhue & Ferguson. This firm continued till 1914 when Mr. Cram continued the Boston office as Cram & Ferguson and Mr. Goodhue continued the New York office as Bertram Grosvenor Goodhue.

In the early years in Boston with Wentworth and Goodhue, their architecture, while not exclusively, was largely ecclesiastical work and their reputation for beautiful churches grew rapidly. Cram, himself a very religious man, lectured in all parts of the country on religious art and architecture and received architectural commissions in proportion to the favorable impressions he made.

The cathedral of St. John the Divine had been awarded to Heins & LaFarge in competition about 1900. That firm had carried out its premeated design through the choir end and the great crossing piers of the cathedral when Mr. Heins died. Soon after this the cathedral trustees elected Ralph Adams Cram architect for the cathedral. Mr. Cram changed from Heins & LaFarge's North Italian Romanesque to English Gothic which the cathedral, now erected, portrays from the choir end forward to Amsterdam Avenue. Cram's contribution to church architecture in Chicago is the Fourth Presbyterian church on North Michigan Avenue and Delaware Place. The late Howard Shaw, besides planning and designing the parish buildings adjoining the Fourth church, superintended the erection of the church proper for Mr. Cram. Space prevents mention of many other outstanding churches designed by Cram and his office.

He was a prolific writer. Not alone are there twenty bound volumes on art and architecture standing to his credit, he was also a frequent contributor to the architectural journals.

For a number of years Mr. Cram was head of the Architectural Department of M.I.T. He was a Fellow of the American Institute of Architects, Fellow Am. Acad. Arts and Sciences, Nat. Inst. Arts and Letters, Boston Society of Architects, Am. Federation Arts, honorary corr. member R.I.B.A.

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Arthur Peabody, retired Wisconsin architect, died in his home in Madison, Wisconsin, September 6, age 83. Mr. Peabody was born in Eau Claire, Wis.; graduated U. of Ill. with a B.S. in architecture; U. of Wis.. gave him Litt. D. in 1930.

Mr. Peabody was architect in the department of construction, World's Columbian Exposition in Chicago in 1891-94; he practiced in Chicago 1894-1905; architect U. of Wis. 1905-15; is credited with having designed more than sixty buildings for U. of Wis. He became State Architect of Wisconsin in 1915 and held that position until he retired from active practice. He was secretary of the Board of Examiners of Architects and Engineers for Wis.; he became a member of the A.I.A. in 1921; an F.A.I.A. in 1932.