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U. S. FOREST PRODUCTS LABORATORY, MADISON, WISCONSIN

PENCIL POINTS FEBRUARY, 1938

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Preliminary study by Gilbert P. Hall for U. S. Forest Products Laboratory, Madison, Wisconsin

HOLABIRD AND ROOT MASTERS OF DESIGN

BY RUSSELL F. WHITEHEAD, A. I. A.

IT is Saturday afternoon. In a small, smokefilled room, high in one of Chicago's proud skyscrapers, two flights beyond the reach of the elevators and hence safe against inadvertent intrusion, sits a group of earnest men. They are clustered, with an air of intense concentration, around a green-topped table upon which a strong light is focussed. To shield his eyes from this light, and perhaps from the gaze of his fellows, each is wearing a wellworn, long-visored cap. From this circumstance, one might take them to be locomotive engineers-or, at least, oilers. There are no oil cans in sight, however - only some glasses, filled to various levels with a fluid that might be oil, from its color, but more likely is another sort of lubricative essence. Each man clutches to his bosom a handful of brightlycolored bits of pasteboard at which he looks closely from time to time as though they had special significance. From time to time also, each speaks laconically in a sort of esoteric lingo and moves to add small, colored disks from one or the other of several ordered piles

near his hand to a jumbled heap in the center of the table.

You have guessed it—the occasion is a regular weekly session of "The Little Daisy Poker Club," an organization which boasts a record of continuous performance reaching so far into the past that only "Pop" Long remembers its beginnings in the days of the elder Holabird and his partner, Martin Roche. Its present membership list opens with the pair of Jacks now constituting the firm — John Augur Holabird and John Wellborn Root and continues to include the principal architectural lieutenants who exercise their professional talents during business hours in the Holabird and Root establishment.

Now, having completed this round of "whang-doodles," let us turn to the consideration of the two unusually gifted architects we have caught here in a moment of relaxation and examine the background which underlies their more serious accomplishments. Only a few intimates know the road they are traveling to reach their ultimate goal. It may not be amiss, therefore, to interrupt the game to ask the players to put their cards on the board for a hasty revelation of their training, their design philosophy, their relations to clients and to their associates.

One year separated the births of Holabird and Root. Both are sons of illustrious fathers. The late William Holabird founded the firm of Holabird and Roche in 1881. Root's father, the late John W. Root, was associated with the late Daniel Burnham under the firm name of Burnham and Root. These two pioneer partnerships carried out tremendous commissions, designing skyscrapers and other large and important buildings in Chicago and the Northwest. Intricately organized and expanded American architectural offices may fairly be said to have first come into being in the Chicago of those days. As the tendency towards big organizations grew, the creative artist at their head was often obscured and came to be considered by rival architects as "just a factory manager." This was sometimes said of him with a note of sympathy and sometimes in derision. The implication was not always fair.

At any rate, into the well-organized office of Holabird and Roche came John A. and John W. in 1914. Holabird had graduated from West Point in 1907 and Root from Cornell University in 1909. In 1914 both had completed their work at the Ecole des Beaux Arts, setting the stage for their architectural entry into Chicago. They thus had the distinction of being thoroughly trained according to the best lights of the times. Their subsequent practice in a changing world has resulted in their becoming thoroughly emancipated from the bias of their schooling.

There is no doubt that since the develop-

ment of large architectural office organizations there has been an increasing dependence of architects upon their assistants. This Holabird and Root discovered during the five years they were serving their apprenticeship as draftsmen, for it was not until 1919 that they were taken into co-partnership.

During the period that closed with the World War abroad and ended here a few years later, it was unfortunately only too easy to copy the classic period designs of the past. All the architect had to do in those days, when he had finally determined just what period took the fancy of his client, was to open the right book at the right page, hand it to the draftsman, and know that he would make an exact copy of the details of design. Root remembers the first big job that was assigned to him-the old Lumber Exchange in Chicago (now the Roanoke Building). They operated on the then admitted principle that the man who could find the rarest book would do the most distinctive job. Root found a wonderful and little known book on Portuguese Gothic and had a circus with it. He admits that the result certainly was not a work of art. That was in those older days-the contemporary approach differs greatly.

Holabird's & Root's conclusions, founded upon their experience, are that buildings should be designed to meet the specific purposes for which they are intended, without

Another view of the Forest Products Laboratory building at the University of Wisconsin for which Holabird and Root were commissioned as architects by the United States Treasury Department. The strong horizontal mass of the structure is broken rhythmically by a series of vertical cypress fins which give a vibratory effect





ROCK ISLAND RAILROAD CLUB CAR

HOLABIRD AND ROOT MASTERS OF DESIGN



The Board of Trade Building in Chicago



Holabird & Root Office Building, 333 N. Michigan in Chicago admixture of sentimental predilections for the way in which such buildings have been interpreted by others. The starting point of all Holabird & Root work has been a careful survey or definite understanding of the requirements and the work to be performed within the building. They know that planning is more than an arrangement of rooms in a serviceable order. It is the coordination of every part and aspect of a building, its site, its structure, its equipment, its furniture and furnishings, and, through these, all that goes on within the building.

While the careers of the two Johns have been almost identical, the men cannot be said to be like two peas in a pod. There are two distinct personalities involved. The conjunction "and" between their names rather than "or" implies something more than a cohesion of two individuals with distinct aptitudes. While there are two minds behind the work of Holabird and Root, yet in the finished work they appear to have functioned as one.

Both Holabird and Root served in the A.E.F.: Holabird in command of 12th Field Artillery, 2nd Division; Root as Captain of the 40th Engineers (Camouflage). Both were made Fellows in the A.I.A., and both enjoy the sports that keep men fit.

In discussing the trend in architecture, John W. has this to say, "What the Greeks did 2500 years ago, what the Swedes have been doing for decades, and what a few American architects are doing, marks the note by which the recent trend must be characterized. The best architecture of today is what we call 'Contemporary.' It connotes continuity of Architecture which benefits from the immediate yesterday for tomorrow's building."

Root hates the words "moderne" and "modernistic." The first he associates with some sort of atrocity, while the latter signifies to him that a designer has been tricky and done something new and different. To speak of "modern architecture" may not be objectionable to some practitioners, but perhaps the term "architecture" is sufficient if the designer can measure up to its significance.

The first intimation of the present-day trend in American architecture came years ago, Root thinks, with the work of Richardson, the great Louis Sullivan, and Root's father, John Wellborn Root, who died in 1891. These men went beyond a mere mimicry of earlier periods and were not prevented, by the public's own idea of its taste, from adding considerable expression of their own creative genius to their works.

At the time these older men were making

their contribution to the good things in modern (1898) architecture, the late Russell Sturgis, architect, critic, and compiler of the Dictionary of Architecture, gave his readers this advice: "Let it be admitted that the true system of architectural design is not to ask for originality but to build on the lines laid down by one's predecessors and let originality come if it will. Let it come if it will, in spite of your exertions to exclude it! That is the wiser maxim for the architect than the contrary one which would bid him seek originality at all hazards." It was Sturgis also who gave expression to his opinion, some forty years ago, that our cities and suburbs might be better to gaze upon if architects were allowed to build plainly for awhile. He suggests, "If no one was held bound and committed to perpetuate the usual amount of architectural detail the designer might get on better with his masses. If no ornament or sculpture were asked for, something like dignity and a true severity (not suggesting raw and bare nudity), might be obtained. If architects were compelled to fall back upon their building, their construction, their handling of materials as their sole source of architectural effect, a new and valuable style might take form, unpleasing as some of its earlier examples might be." End quote! It is apparent that architects have not been forced to ask permission of their clients (if any) to "build plainly" during the past eight or nine years. No one seems to have demanded that the designer crowd his building with elaborate details. The unpleasing earlier examples-raw and bare-have put in their appearance and the "new and valuable style" has begun to take form. The designer is getting on better with his masses!

Among the works of any architectural firm which numbers two or more designers, who deserve that appellation, there are distinctions which may be drawn. Even when the designers work in harmony over the same drafting board-if such a case there be-the conception they are trying to bring out is surely not a partnership affair. "The Guilt is personal," states the law. The original thought of one inevitably imposes itself upon the other. This does not, of course, prevent the partner from offering valuable suggestions toward improving the realization. We can imagine Holabird as critic and censor of the design idea conceived in Root's fertile brain and vice-versa when Holabird comes forward with his solution of an unusual and perplexing problem. Behind the personality of the designers, however, there must exist a highly efficient organization without which works of magnitude



The Palmolive Building in Chicago



tographing

Ramsey County Court House and Saint Paul City Hall, Saint Paul, Ellerbe & Co., Associates





blical Building New York Insurance Exchange Proposed Chicag Gilbert Hall's renderings of three skyscrapers designed by Holabird & Root

and complexity, as those herein illustrated, would be impossible. The exigencies of their large practice permit neither Holabird nor Root, nowadays, to make many drawings. We are told that Socrates wrote little, or none at all, but he had an excellent disciple in Plato. David W. Carlson, Helmuth Bartsch, Richard M. Cabeen, and, until recently, Gilbert P. Hall are inspired disciples who are gifted with the ability to understand and to preach the masters' philosophy of design, to draw like angels, and to sit-in at the famous poker games at "The Little Daisy Club."

An architectural critic, Henry Russell Hitchcock, has stated that "It is impossible to say whether many of the outstanding architects of America, since the development of an office organization, could have designed a building: it is very clear that few of them have ever directly done so." Evidently he did not know when he made that statement just how the office system of Holabird and Root functioned. Root and Holabird are absolutely responsible for all the work done in both large and small undertakings. Because of their close contact with all their commissions they should be justified in taking a personal pride and satisfaction in the achievements of their office and the recognition accorded their efforts.

All designs, perspectives, preliminary sketches, complete working drawings and details, including structural drawings, mechanical, electrical and sanitary equipment drawings, and complete specifications are prepared within Holabird & Root's own self-contained organization, as are all matters pertaining to contracts, issuing certificates, and records. Competent superintendents, trained in their methods, both architectural and mechanical, are on the work from start to completion. At one time the organization included some three hundred assistants. The office rolls of Holabird & Roche and Holabird & Root include many architects now in private practice who have passed through this great training school.

Though the citation for the Gold Medal of Honor in Architecture awarded by The Architectural League of New York in 1930 to Holabird & Root stated "for the great distinction and high architectural quality they have achieved in the solution of the American Office Building," the partners have never posed as specialists in any particular kind of building. They prefer to study each commission as a separate and distinct problem.

Both Holabird and Root have a clear vision and a good idea of what they are about when designing modern "skyscraper" buildings. The



One of Six Preliminary Sketches Half-hour charcoal studies by Helmuth Bartsch of proposed Chicago building

only evidence necessary to establish the significance of their premises lies in their executed work. They have had many opportunities, in the past, to stand up, man to man, against hard-bitten real estate operators, ironvisaged bank directors, complacent never-tobe-fooled hotel operators, and many-minded building committees. They have accepted their opportunities with an understanding of the limitations imposed. The forces producing a commercial building and the limitations which mould the form are all a part of the design. When design is mentioned, the layman, and oftentimes the architect as well, thinks of the mass of the building-that which can be seen as a whole. The whys and wherefores of what meets the eye are seldom given a thought. They do not realize that the shape and area of the property must determine the bulk, that the depth of day-lighted floor areas, size of courts, the zoning regulations, the demand that rentable area bear a proper relation to the total cubage to produce a paying investment, and other economic factors control the design. The designer of the office building, in his courtship of the muse of architecture, has many chaperons. The owner or building committee, the real estate man, the structural engineer, and the elevator expert sit close by the couple, while in the drafting room and contractors' ante room, with the doors wide open, are grouped the heating, sanitary and electrical engineers, all waiting to pass judgment upon the plans. It is a hectic wooing, rushed along by the chatter about "Time is money." The designer has only brief moments in which to take a critical glance, over his shoulder at the "woman he loves."

The brilliant successes achieved by this firm of American architects must necessarily make a peculiarly powerful appeal to their contemporaries and successors. Their buildings have been designed under the same conditions confronting the profession today, obliging them to satisfy similar needs. When eminence of achievement is united to contagious individual enthusiasm and winning personal qualities the influence of John Holabird and John Root is bound to pass on to their fellow architects, giving not only form to American architecture but also continuity and vitality. It would be difficult to exaggerate the debt which our contemporary architecture owes to the personal influence of some of its more eminent practitioners. These masters of design have aided their associates, both young and old and have inspired them with a lively devotion to good architecture.



Winning competition drawings for the Chrysler Exhibition Building at "A Century of Progress," Chicago. Holabird and Root did only this one building at the Fair but it was one of the most successful designs produced for the occasion. The eight members of the Architects' Commission had assigned to John Holabird, their Chairman, the job of designing "Building Number One," a project which unfortunately never was carried out due to lack of funds



PENCIL POINTS FEBRUARY, 1938



HOLABIRD AND ROOT MASTERS OF DESIGN



A slashing charcoal preliminary design study for Wieboldt's Department Store at River Forest, Illinois. The more careful drawing below shows approximately the final design which adhered quite closely in both spirit and material form to the original concept





Three years ago, as the result of a competition, Holabird and Root were commissioned to design an important extension to the Chicago Art Institute. Their winning design served only as a point of departure, for, after much restudy, it was developed along the lines indicated by this recent model





HOLABIRD AND ROOT MASTERS OF DESIGN



Courtroom in the Ramsey County Court House in Saint Paul, Minnesota, designed by Holabird and Root in association with Ellerbe & Co. The courtroom below is in the Racine County Court House at Racine, Wisconsin, designed by Holabird and Root





RAMSEY COUNTY COURT HOUSE, SAINT PAUL, MINNESOTA

HOLABIRD AND ROOT MASTERS OF DESIGN



Hedrich-Blessing

For the Racine County Court House, Holabird & Root drew upon the genius of Carl Milles who provided appropriate sculptural embellishment as shown by the two views herewith









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A bouse designed by John W. Root was erected on the eighth floor of the Marshall Field store in Chicago with the landscape plan here shown carried out in its entirety. Two views of the model of this house indicate the simplicity and charm of its external aspect. The honor of sponsoring this project was shared by the Field store and The Woman's Home Companion in cooperation

> PENCIL POINTS FEBRUARY, 1938

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Two views of the famous "Diana Court," an alteration to the Michigan Square Building, designed to make a setting for a wholly admirable fountain executed for it by Carl Milles

> PENCIL POINTS FEBRUARY, 1938



HOLABIRD AND ROOT MASTERS OF DESIGN



Study in sepia pastel by Helmuth Bartsch showing a suggested design by Holabird & Root for a "Ladies' Ready-to-wear" salon in an important urban Department Store .

...



Another of Bartsch's pastel studies for a department store interior as designed by Holabird & Root. This view, as may be seen, is taken at right-angles to the other



Perspectives of three designs by Holabird & Root. At the top, the Amalgamated Bank Building, a "tax-payer," at Monroe and Dearborn streets in Chicago. At the bottom, a proposed apartment building at Oak Park, Illinois. In the middle, a proposed building for a municipal airport



A charcoal study by Helmuth Bartsch showing Holabird and Root's suggestion for a two-story bar in a hotel. The idea was considered to have great possibilities but the hotel management was fearful lest the "bar flies" who chose to alight on the upper level might develop alcoholic grudges against the more conservative drinkers on the floor below—even to the extent of hurling glasses and bottles down upon their heads



A charcoal study for an important addition to the Grant Park Stadium, now known as Soldiers' Field. Holabird & Root won the competition for the Stadium in 1924 and were awarded the commission to complete it



THE FIELD HOUSE, UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

HOLABIRD AND ROOT MASTERS OF DESIGN



Hedrich-Blessing

The Research and Engineering Building of the A. O. Smith Corporation in Milwaukee, Wisconsin, designed by Holabird & Root, Architects. Metal and glass have been here utilized extensively. The V-shaped hay windows are formed of extruded aluminum frames and spandrels. The entrance feature and the base are of pre-cast black granite synthetic stone, while the corner piers are of limestone. A traveling crane on the roof supports the window washing apparatus. Although the design and construction were somewhat revolutionary, only six days were required to close in the first of the two identical elevations. The other side, benefiting from the experience, took but three days



HOLABIRD AND ROOT MASTERS OF DESIGN



The Holabird S Root organization does its own interior decoration. This branch of its activity is in charge of Johns H. Hopkins. One of the forces that interior designers have to contend with in the treatment of contemporary rooms is the fluctuating influence being exerted in the name of modernism. Above, we have a study for the Master's bedroom and, below, a study for the guest room in the same bouse. These expressive yet simple drawings were made by Helmuth Bartsch with colored pencils



PENCIL POINTS FEBRUARY, 1938



Hedrich-Blessing

In a group of new fraternity bouses at Northwestern University, Holabird & Root have produced a simple and satisfying version of the modern domestic style



HOLABIRD AND ROOT MASTERS OF DESIGN



Hedrich-Blessing

A close-up of the entrance to one of the fraternity houses forming the new group at Northwestern University designed by Holabird & Root. The charm that results from well-studied simplicity will have its effect on the lives of the young men who reside here

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"A Peace Memorial," conceived and executed by Carl Milles for the lobby of Holabird and Root's Ramsey County Court House in Saint Paul. The "calm giant," an American Indian with his "peace pipe," rotates slowly on his axis as he radiates his symbolic "good will toward man" generously and indiscriminately in all directions

INVITATION TO DEBATE

IN resuming last month, after an extended lapse, our policy of printing in every issue the measured observations of a responsible architectural critic, we did but reaffirm our continued faith in the value to the active designer of serious criticism, expressed without malice but also without fear. Professor Hamlin, who succeeds the late Mr. Magonigle as our critic, is both a scholar and a gentleman. He brings to his task a keen, well-informed mind and a talent for clear analysis and expression. As Avery Librarian of the School of Architecture of Columbia University it is his duty as well as his pleasure to keep up to date in his reading of architectural books and magazines published the world over. His is therefore an unusual opportunity to keep abreast of architectural thought as found in both the executed works and the philosophies of contemporary designers in all countries. He is no bookish recluse, however, but is in alert contact with the actualities of the world of today, both through personal participation in the many architectural and cultural activities of his community, New York, and through travel to and correspondence with more distant centers.

As you follow his writings in these pages, some of you will be moved to disagree with his pronouncements. That seems inevitable. We would be disappointed if it were not the case. It is our hope that out of whatever disagreement arises there will be stimulated a healthy debate. We urge any of you who may have points of dissent to write them down and send them in that all may learn therefrom. We promise you a fair hearing.

THE EDITORS

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A CONTEMPORARY AMERICAN STYLE

SOME NOTES ON ITS QUALITIES AND ITS DANGERS

BY TALBOT F. HAMLIN

THERE is no question about it; for public buildings America is developing a style. One may like it or not, but there it is. By style I mean some general similarity of building forms running through large numbers of buildings of any one period and region, and, especially, a sufficient similarity to enable the competent observer to recognize it and correctly place the region and period of the buildings marked by it.

That such a similarity runs through much recent public building in America should be obvious. I do not refer to the Washington Triangle, for that whole monstrous aggregation of useless colonnades and heavy-handed ornament is pure wish-fulfillment phantasy, without plan, without reference to present culture or past history, the result-most expensively incarnated-of a colossal misunderstanding of the history of American architecture and the real aims and achievements of L'Enfant, Thornton, Latrobe, Hoban, and Mills, who had a vision of Washington as a living city. The American style I have in mind is rather that which appears in the New York State Building in New York City, in the Post Office in Chattanooga, in the Albany and Hartford Post Offices, in the Los Angeles City Hall, and in the State Capitols of Nebraska and Louisiana. It appears, also, in much of our larger commercial work-in the Bonwit Teller Building in New York (Warren & Wetmore, Architects) for instance; in almost all the work of Holabird and Root; and in many portions of Rockefeller Center.

This style is generic, not detailed. It is based on some common assumptions with regard to the aims of architecture, the use and expression of materials, and the function of decoration. The style is generally classic in ideal; that is, concerned primarily with the arrangement, shapes, and relations of form. It is a style that sometimes, recognizing its classical basis, adopts frankly classical mouldings, cornices, or conventional proportions, but it avoids the use of the orders and is usually free from historical precedent. It accepts the freedom of steel construction, but it never considers the expression of structure as more than a minor factor. It believes in the greatest restraint in the use of architectural ornament, but it welcomes richness of decoration in wellapplied sculpture and in the lavish treatment of metal grilles, window and door frames, and other minor features; and it loves broad surfaces of rich materials. Usually, though not always, it seeks for axial symmetry and definite monumentality of effect. In government buildings, it generally prefers low, horizontal patterns, and continuous repetitions of simple, similar openings, with a higher entrance featured by wide flanking piers, sometimes treated like projecting pylons. In commercial city buildings, on the other hand, it often accepts height as the dominant feature, accenting it with long continuous vertical bands of white stone between all the windows-usually two to each structural bay-but no effort is made to accent the strips at the supporting columns. Sometimes, as in the Bonwit Teller Building, it seeks monumental simplicity by using a plain envelope of stone slabs, with the windows as simple holes in the surface. It is becoming almost the universally accepted type for the more expensive structures throughout the country. Its ubiquitous popularity makes one realize that it is, actually, a style, and not a series of accidents; it is almost the American style of today.

This new American classicism, like any style, was the product of true evolution, of trial and error. It was born originally, perhaps, in some of the simplified classic buildings of a hundred years ago, and then forgotten under the impact of the Civil War, of extraordinary expansion, and of the 19th century eclecticism. It was born again in the later work of B. G. Goodhue, especially in four projects, the last three of which were built: the competition design for the Kansas City



The Nebraska State Capitol, by Bertram Goodhue, signaled that master's conviction "that archæological architecture was dead; that modern structure, needs, and culture all united to demand creative design"



It marked "a new feeling of the integration of structure and design . . . it was a masonry building and looked it"

War Memorial, the Washington building of the National Academy of Sciences, the Los Angeles Public Library, and the Nebraska State Capitol. In these designs Goodhue was asserting two great convictions. The first was that archæological architecture was dead, that modern structure, needs, and culture all united to demand creative design. This he felt so strongly that-although an excellent Spanish baroque design for the Los Angeles Library had been prepared and accepted before the War, and complete working drawings madewhen the time came for actual construction a number of years later he junked everything he had done except the plan parti, and at his own expense redesigned the building and prepared an entirely new set of drawings. (What an evidence-which so many of us might take to heart-of true artistic integrity and noble professional ideals!) The second conviction was that the natural expression of American culture was somehow basically formal and classic.

There were, of course, other virtues in the Goodhue buildings besides their stylistic novelty. There was a new feeling of the integration of structure and design, for instance the Nebraska Capitol was a masonry building, and looked it; the reinforced concrete of the Los Angeles Library was often left exposed and painted, and became an integral part of the design both outside and in. But it was the style quality which was the obvious thing. Both architects and laymen fell under its influence with surprising unanimity.

To this influence was added that sudden waking up to the possibilities of independent and creative design, alike in architecture and furniture, that came with the Paris Exposition of 1925. This is illuminating, because it shows another element in the development of "style" -the importance today of commercial exploitation. Dislike as we may the overwrought eccentricities of much of the work at that show, it is, I think, indisputable that, without the flood of "modernism" which followed that exposition in furniture, lighting fixtures, and so on, today's readiness to consider and to adopt new forms (slight as that may be) would have been impossible. Commerce taught the buying public what forward-looking architects had known for some time, that archæological architecture was dead. It was so dead, in fact, that even the very architects who had designed adequate buildings in archæological styles twenty years before were no longer able to do so. One has only to compare the Scottish Rite Temple in Washington with the recently notorious Jefferson Memorial design to realize that. The evidence lies in the corpses of the Washington Triangle.

Yet classicism, in its larger sense, was not dead. People still loved noble materials, noble proportions, serenity, quietness, the sense of permanence. The people demanded, especially in public buildings, monumentality. And, in the end, people get what they want. That is what makes architecture a folk expression as well as an individual art. The people, in the long run, hold the purse strings. They will not build what they do not like. Individuals, of course, can be taught to like this, that, or the other type of building; but take all the people who build, particularly those who build collectively, as in public buildings, and the results will be some common expression of their tastes. Buildings, however beautiful, expressive, or correct, outside of that, will remain isolated experiments; no popular style or inspiration will flow from them. If they are great enough, of course, later generations may grow up to them and make them sources of inspiration; that is one of the tests of architectural greatness. But for the time being, they will remain apart, unknown, and, for the nonce, sterile.

II.

If this is true, we may then say that this new style is American, the expression of a true popular taste, arrived at by a democratic process. It is not strange that it has certain resemblances to some of the more distinguished and simplified work of the early republic, like the best of Latrobe or Mills or Lafever. Above all else, a democratic people needs a sense of innate form to control the vagaries of popular opinion. Formal relationships, in a sense, are more important in a republic than anywhere else. And in that sense an architecture based primarily on a sense of form, an architecture seeking the expression of permanence and monumentality as a symbol of republican idealism, is the natural architecture of a republic.

If this is so, the architect faces at once a most important practical question. What should be his attitude towards this style? How should his recognition of its existence influence his work? How far can he go in fighting it, if it is contrary to his own ideals? And here we pierce to the heart of one of the most insidious and dangerous fallacies in much architectural criticism—the refusal to recognize the fact that architecture, as the sum of built buildings (which in the long run constitutes the style), is a very different thing from archi-

tecture as the art with which one individual designs one definite structure. The danger of stylistic generalizations in criticism lies in a confusion of these two definitions. Because a building is in a current style, it is not necessarily either good or bad. Style is not a panacea, nor a curse. It is merely a language. For an architectural designer, I believe, it is just as dangerous to consider "style" as it is for a writer, as a creative artist, to write down to his audience. The style-designing architect and the market-writing author may make good livings, but they tend towards stagnation in artistic development, not only for themselves, but for their public and the very "style" or market they aim to serve.

In other words, the architect must, as far as he can, divest himself of the conception of style. He will have, of course, to make certain basic decisions: Is the expression of structure to be dominant? Is the expression of function to control? Or are these, like the honest and expressive use of materials, merely parts of the creation of a new beauty to enrich the world? Designers fall naturally into two classes-those who, like the French gothic architects, make structure the control; and those who, like the Greek and the Italian renaissance architects, make formal beauty of proportion and detail their chief aim. Both types are necessary; the one to prevent architecture from becoming mere stage scenery, the other to see that it never disintegrates into mere dry scientific theorism.

But, once these primary decisions are made —and they are usually made unconsciously as a matter of character or temperament—all thought of style should vanish from the designer's mind. He must apply to his specific problem the best imagination and thought and integrity he can. The unconscious impact of other things—of how other people design and of what people "like"—will be more than sufficiently strong. He must learn, of course, from other people's failures and successes, and from his own. Absolute independence from outside style pressure is impossible in these days of photographs and violent architectural propaganda, but it must be steadfastly sought.

For in style independence by the designer lies the only hope of architectural progress, of a living style itself. When Abbot Suger's men built St. Denis, they were not conscious of helping the start of a new gothic style; they were just building as well, and as beautifully, as they could. So of the men who erected Amiens, so of all the great designers. Goodhue, in the design of the Nebraska Capitol, was not interested in style, but in giving to the task



This small view of the Chattanooga Post Office, for which R. H. Hunt was Architect with Shreve, Lamb & Harmon, Associate Architects, gives a better view of the raised portions of the end pavilions upon which comment is set down in the text below

the best that was in him. So the architect today—the true architect—must strive merely for that. The more varied the buildings that result, the more vital the resulting "style" will be. Be yourself — functionalist, expressionist, romanticist, or classicist. Let the people who pay the bills create the styles. Your only job is to be honest with yourself—and to create.

III.

There is one lesson to be learned, I think, from many examples of actual work built in this style. It is the lesson of simplification, of clarity. Thus, many of the works of Holabird and Root show the merits of the style and its dangers; they show, also, a continual growth and change that illustrates the necessity of continual experiment. In the Palmolive Building, a new note in American architecture appeared, a new attempt to modulate the surfaces of a business building as one sculpturesque mass. In 333 North Michigan Avenue, and especially in the Chicago Daily News Building, the same quality was found; but in these the result was less successful, for the mere quantity of windows destroyed the mass effect, and the relief of the various parts was so slight as to count only under certain special lighting conditions. These proved the limitations of this approach; only a greater and greater simplicity of design, a more and more open clarity, could speak through the complexities of a modern building. So in the Ramsey County Court House and St. Paul City Hall, St. Paul, Minnesota, the forms are cleaner, clearer; the whole is beginning to show its underlying geometry. And, strangely enough, though there is less evident verticality, less stressing of steel bays, the whole seems somehow truer to the whole logic of steel construction. In their designs for the Wieboldt store, and for a proposed apartment house, the final steps towards simplification have been taken. The simple geometry of the forms of each has controlled the design; yet it is still basically formal, basically classic, and both buildings have a quality of vitality, of significant form, that is compelling. Function and structure and materials have been integrated.

The Chattanooga, Tenn., Post Office, by R. H. Hunt and Shreve, Lamb & Harmon, is most significant example of the new classicism. Impressive in size and scale, carefully studied in proportion, it gives a new dignity to a confused city. Its formal classic composition-a continuing central motive, stopped by two end pavilions-is strongly, almost heavily, stressed. Its forms are generally stripped, clean, clear. Mr. Harmon has said that the decoration of delicate relief on the jambs of the entrances does not satisfy him and probably should have been omitted, and that he is not sure of the raised portions, or towers, over the end pavilions. Now both of these elements, which are minor to the whole conception, are in the nature of additional, unnecessary elements. Simplification, to stress the basic geometry of a design-is not this the lesson? Style is not enough; clarity must be the controlling aim.



A close-up of the Chattanooga, Tenn., Post Office-R. H. Hunt, Architect, Shreve, Lamb & Harmon, Associated Architects. The delicate ornamentation inside the jambs of the openings might better have been omitted, thinks Mr. Harmon, as an unessential element



Richard Averill Smith

In this detail of Lorimer Rich's United States Post Office, Madison Square Branch, New York, the application of fine sculpture as ornament "gives life and humanity to the whole." Of the five spandrel figures, the central three were done by Edmond Amateis and the other two (one of which is visible here, at the left) were by Louis Slobodkin. The spandrels are of cast-iron, with gilded figures in relief on a black background

A series of post office designs by Mr. Lorimer Rich makes this even more clear. The dark, polished surfaces and the strong, simple forms of the Madison Square Post Office are a new note in the city picture of New York, with a large simplicity and a general beauty of proportions which are admirable. Between the piers, the window spandrels are heavily banded with ornament which reveals the same classic revival inspiration as the pier caps. Gilt sculptured figures in these spandrels give life and humanity to the whole. The use of the figures is important; they are not "ornament" from a drawing board via a modeler, but the work of a sculptor. May this not mean that sculpture, not ornament, is the only fit decoration for buildings of this simplified type? And Mr. Rich says that, if he were doing the building today, all the banding and ornament on the spandrels would go, and the sculptured figures be made larger, more important. The building would thus have gained in power and human appeal.

The second of Mr. Rich's post office designs is that for Forest Hills, Long Island, now under construction. Caps are gone from the piers. Ornament has well-nigh disappeared. The corner site and the requirements of the plan led to the two-mass scheme, with a lower element wrapped part way around the higher. This has been chosen as the dominant theme; it is emphasized in every possible way-by the relation of the door to the lower mass, by the coping, by the change in level between door and window tops, by the small windows of the lower part, which continue on the end beyond the corner. For decoration, there are beautiful materials-rich, dark, matte terra cotta in large plaques; and sculpture-one large and simple relief over the door, for which an open competition between the sculptors of the region is now under way.

The final example is the Johnstown, Pa., Post Office, also under construction. It is still another step in progressive simplification. If the content of the Forest Hills building was the careful design of two related and interweaving volumes, that of Johnstown is merely a study of beautifully articulated unity, with everything done to emphasize that. A sweeping, continuous coping line, stressing horizontality; six carefully designed openings; two masses of sculpture against plain wall surfaces-that is all. Note that there are six openings, not the usual "classical" five. Five openings would have stressed a central axis too strongly; the even number makes for horizontal continuity. The placing of the sculpture still further carries the eye on, and down, to a



Two United States Post Offices now under construction —the one above at Forest Hills, Long Island, N. Y., and the other at Johnstown, Pa. They were both designed by Lorimer Rich, Architect, and are being carried out under the direction of the Office of the Supervising Architect of the Treasury Department. In conjunction with the Madison Square Branch P.O, in New York, shown opposite and overleaf, they form an interesting progression toward beautiful simplicity of style





Richard Averill Smi

This view of the complete façade of the Madison Square Branch P.O. on 23rd Street, New York, shows its "large simplicity" and "general beauty of proportions" that excited Professor Hamlin's admiration. The design, as you now know, was by Lorimer Rich, Architect, and was carried out under the direction of the office of the Supervising Architect of the Treasury

quiet sinking rhythm at the corners. It is all the most simple, but the most subtle, interweaving of relations-all arranged to emphasize the simple geometric unity. The openings, too, though still tall and slim, like those in the other two examples, have been changed in feeling. In Madison Square, the piers between the openings have capitals. In Forest Hills, the capitals have disappeared, but the pier idea has remained dominant, emphasized by the recessed walls under the openings. But, in Johnstown, the architect has realized that it is not the pier that is important, but the opening itself, which relates the outside and the inside, which ties together unitary volume and its exterior expression. So here the opening has been accented by carrying a delicate moulding around it, top and sides alike, to form the last subtle touch in emphasizing the unit geometry that is the foundation of the design.

Thus, by continual advance, continual experiment, and absolute refusal to be bound by style, style itself is born; it is only the architect who can sufficiently insulate himself

against the style idea who produces those continual changes by which style grows. Giuseppe Pagano, in the November Casa Bella, has an interesting essay entitled "In Search of an Italian Character," supporting the idea of freedom and modernity in design against the protests of those who find contemporary Italian architecture un-Italian because it does not directly use Roman precedent. "Pride in simplicity," he writes, "sensitiveness to pure volume, desire for clarity and modesty, are not an indication of poverty of imagination, but a proof of a new way of feeling beautybeauty with the rigorous control of logic and geometry-beauty which is perfectly classic in the purest meaning of that word." Might that not be a perfect statement of the real creative impulse that is, with many hesitations and mis-steps, creating our new American public building style? The great danger lies in the word, style. Once that is assumed as a category of forms to follow, then style itself dies: for life demands variety, experiment, logic, and daring.

THE DILEMMA OF THE ARTIST

BY ROBERT L. ANDERSON



It has been indicated that, in the 19th century, Art was set up as an "absolute" value by the Romantic poets and philosophers who were in revolt against the tyranny of 18th century Reason; that the result was the creation of a Religion of Art; that this religion developed into "æstheticism" on the one hand, into archæology on the other. It likewise has been indicated that by the close of the 19th century a reaction against both æstheticism and archæology had begun, resulting in a revulsion from the pursuit of beauty as legitimate occupation for serious and intelligent men.

That the 19th century Religion of Art should collapse was, of course, inevitable. For æsthetics, alone, is completely incapable of illuminating the multiple horizons of the immediate practical world which is the inescapable fortune of the human race. Perhaps, in the past, art was able to provide such universal illumination. Today, with the far-flung and complicated horizons set up by the Industrial revolution, it is no longer possible.

It is not altogether surprising, therefore, that men should come to the conclusion that, as an idea of destiny, art was, as Oswald Spengler later expressed it, a "played-out mine." And, having come to such conclusion, men experienced no great difficulty in shifting their interest elsewhere. Always provided, of course, they were not committed by nature to practice one of the arts.

Even the incipient literary artist was somewhat free to depart. For, being even more bound to intellectual ideas than to beauty, literature could step from æsthetics to philosophy, or sociology, or propaganda, with the maximum of ease and the minimum of discomfort. As a matter of fact, the literary artist not only can, but should, step away from beauty and from the simple physical world. Who wants to read a "beautiful" novel? Who wants to read nothing but Imagist poetry?

It does not follow, however, pre-War or post-War conventions to the contrary, that the æsthetic floodlight should be eliminated completely from the universal circuit. Certainly such elimination impales one group of society, the non-literary artists, upon the horns of a peculiarly fatal dilemma. For, to eschew beauty and the physical world is, for all but the literary artist, like stepping out of an airplane without a parachute. How fall two thousand feet and still survive? This was the dilemma the artist faced at the beginning of this century. It is the dilemma facing him now.

Had those earlier artists consciously considered their dilemma perhaps they would have seen that the solution was simple. But in a crisis people cannot take time for careful consideration. And in this particular case it could hardly be expected that they would do so. For the terrific reaction against the artist as creator of beauty was due primarily to the fact that people had been educated to believe that he was likewise the creator of truth: Universal and Eternal Truth. The higher they fly, the harder they fall.

The only way to cushion the fall was to realize that the crash was due, not so much to the fall, but to the fact that the artist had been encouraged to fly too high. Beauty may be a truth, but it is only a partial truth.

It is not, however, easy to attribute a fall to the fact that one flew too high. Particularly when one has been encouraged to believe "the sky's the limit." It's much easier, particularly on the ego, to believe that the technique was faulty.

What bothered the artists, then, was how to get back to the heavens, now that they had fallen flat. Beauty and the world of form wouldn't catapult them back. What would?



II. The Evolutionary Catapult.

It is somewhat erroneous, of course, to speak of the dilemma of the artist as arising immediately on the collapse of "art for art's sake" and the resultant flight from the pursuit of physical beauty. For it is doubtful if the plummeting artist had time even to realize he was falling before he was catapulted back into celestial ether by a force which, having been prepared beforehand, was already in action.

As has been indicated, the Religion of Art was initiated as a revolt against the 18th century Religion of Science, and particularly against the 18th century deification of Reason. It is questionable, however, whether the Romantic revolution would have been able to carry art to its ultimate apotheosis assisted only by faith in those qualities of instinct and emotion which are the primary characteristics both of art and of artists. Before such apotheosis could take place, art had to be allied with the great 19th century concept of Evolution.

At the present time we still tend to think of the theory of Evolution primarily in its Darwinian or scientific sense. In reality, however, the concept of evolution meant infinitely more than the thought that human beings perhaps once had tails and walked on four feet. It meant more than biologic evolution. It was a comprehensive "destiny idea," with all the ramifications such destiny ideas entail.

The mediæval world conceived existence as merely a somewhat fateful interim before that Judgment Day which would send each, either to that celestial Utopia once known as Heaven, or to that inferno of fire and brimstone once spoken of as Hell. The Renaissance world alike forgot Heaven, Hell, and the Future while gazing with delighted astonishment upon the terrestrial world and the immediate present. Even when it looked into the celestial world it saw not Heaven, but Astronomy. The 17th and 18th centuries rationalized both the heavens and the earth into the static Newtonian world-machine which permitted Pope sententiously to proclaim that "whatever is, is right." By fixed, immutable laws the universe was governed; and the future held promise only of the discovery of such laws through the instrument of Reason.

At this point, the Romantic revolution broke. Instinct and Emotion and, eventually, Art were hoisted onto the pedestal formerly occupied by Science and Reason.

But the Romantic revolution accomplished much more than the simple substitution of one divine portrait bust for another. It meant the substitution of pedestals as well. Not only was Reason dethroned for Art, but its eighteenth century pedestal — the static Newtonian world-machine—was shattered as well.

What was substituted was the notion that existence was neither a prerequisite for a celestial Utopia; nor a span of years having neither past nor future; nor yet a rigid, mechanical contraption of perpetual and unchanging motion. Existence was, on the contrary, a phase of a process of evolution. Man had not, as had been assumed, been created; he had evolved: and his thoughts, his customs and the world which he inhabited had evolved with him. Existence was, quite simply, the most recent stage of that evolution of life and thought reaching back through time to dissolve in water, earth, air, and utter silence.

This, then, was the great spectacular Destiny idea of the 19th century which was to pervade the universe; the great cosmic concept within which all human activity—philosophy, morality, art, politics, economics, history, science—could sustain themselves and expand. And because existence was no longer static but evolutionary, it followed that art was no longer simply art. On the contrary, it was the expression of evolving civilization; an index of the evolutionary process. Art was not art: it was the "expression of civilization." It even became the thing itself: "Properly understood," wrote Lethaby, "architecture is civilization itself."

Having been thus anointed with the Holy oil of Evolution, artists were once more free to settle down in their celestial armchairs, secure in the conviction that they were indeed inhabiting Olympus. True, in consequence of the revulsion from pure beauty, the clouds on which they walked had shown a disposition to part suddenly underfoot. But, like a great geyser of air from below, the 19th century doctrine of evolving society had blown them back from the bottomless abyss to the topmost pinnacle of cloud. There they sat in Holy estate; not as artists, but as exponents of Culture, indices of evolving Civilization.

THE AESTHETICS OF BRIDGE DESIGN

BY AYMAR EMBURY II

EDITOR'S NOTE: The author of this article has had the good fortune to be closely associated in the design of various bridges with a number of engineers: Mr. O. H. Ammann, Chief Engineer of the Port of New York Authority; Messrs. Robinson & Steinman; Messrs. Waddell & Hardesty; Messrs. Needles & Tammen; Mr. Emil Praeger; Mr. Ralph Smilley; and Mr. Allston Dana, Engineer of Design of the George Washington Bridge, Whitestone Bridge, and the Triborough Bridge; and a very large part of the opinions and statements of fact made berein are derived from the engineering members of the several associations. It was the author's bope that Mr. Allston Dana, with whom the architect's collaboration has been the longest, closest, and most continuous, would have collaborated in name in the preparation of the material—as indeed he has in fact, although he modestly declines to admit it. Much of the text is actually the transcription of conversations with Mr. Dana and the author desires to affirm explicitly his obligation in this respect. The article is available here through the courtesy of the editors of CIVIL ENGINEER-ING, in which magazine it is appearing simultaneously.

1. The Architect and the Engineer

LET us be honest about it. The architect and the engineer do not always hit it off very well and there exists between the two professions a sort of nebulous hostility which, if analyzed, is discovered to be a curious combination of not too heavily veiled contempt and a sort of grudging admiration. The architect is accustomed to stress the æsthetic rather than the practical-that is to say, the appearance of things rather than their construction. He sometimes looks upon the engineer as a rough uncultured fellow who not only deliberately denies himself the happiness of æsthetic appreciation, but is probably incapable of it anyway, while the engineer seems to think that the typical architect is a feeble sort of dilettante who doesn't know anything about structure, could not think clearly about it if he did, and who therefore tries to cover up his lack of fundamental knowledge with a lot of mushy words about "beauty" and "proportion" and so on. There is probably some justification for such a feeling on both sides. There are a good many half-baked architects and, while in no engineering magazine would

we dare to make a definite assertion, it has somehow been borne into us that there are engineers who really don't know their business any better than the architects, except for the somewhat primitive ability to discover a radius of gyration and to use a table of logarithms.

While the architect will not very often admit it, he is consumed with a sort of secret envy for the man who really knows why things stand up, or who, if he really doesn't know it, which is very likely the case, can at least make an approximately correct estimate of the amount of materials which is necessary to put in a column so it will not bend, or even more marvelous, knows how the material should be disposed about the axis of the column. The engineer likewise, contemptuous as he is of the architect's preoccupation with æsthetics, does not feel that any really important engineering work is complete without an architect tacked on somewhere.

Now, this condition of affairs is neither sensible nor productive of good results. Engineering and architecture are fundamentally the same art and for many centuries the practitioners were indifferently called by both titles. Sir Christopher Wren, when he built the dome of St. Paul's, tackled a strictly engineering problem and, in the light of the knowledge of his own time, did a pretty swell piece of engineering work-at least it has stood up for three hundred years with little upkeep, which is after all the test of good engineering, although one engineering collaborator has said that a good many engineers would prefer to have it fall down if it were good engineering rather than stand up if it were bad. Vauban, while he was primarily a military engineer, also enjoyed the title of "Architecte du Roi." With men of that generation there was no cleavage between the structure and its adornment, no petty jealousy between the architect and the engineer, who should be a unit no matter whether the two functions are combined in one person with knowledge of both architecture and engineering, or in a pair of

men, or even in a large group working together. And this partnership should begin at the very inception of the job; structure and æsthetics are inseparable; the structural design cannot be completed and the æsthetic applied to it like a coat of paint. That is like a hunchback with a beautiful skin—the form shows through.

The value of the architect in the association between engineer and architect on largescale engineering works arises primarily from the fact that the whole of an architect's training leads him to consider from the very beginning what the structure is going to look like; an architect constantly studies the problem by means of sketches in perspective, while the engineer begins with diagrams and a table of weights. Both engineer and architect, of course, rely far too much upon habit and precedent-the engineer thinking, and often saying, "This is the way Jones and I did it in the Smith River Bridge which turned out very successfully," while the architect says, "Now I remember the Roman Bridge at Albi . . . ," and neither of them really takes the trouble to find out what they ought to do on this new bridge over the Robinson River.

The Engineer, looking at the problem from his own past experience says, "What you propose, Mr. Architect, is not good engineering," when all he means is that it is not an economical structure, although he is usually not even certain that it is not; and when the architect says, "This is a lousy looking piece of design," all he means is that it is different from the masonry structures on which he has been brought up. There is not any doubt but that habit of mind has an immense effect on æsthetic appreciation. We cannot really judge a new piece of design correctly; we have no standards of comparison. On the other hand, there is always a tendency to admire novelty regardless of its positive æsthetic value. There is only one true arbiter of beauty-Timealthough it may truly be said that no structure which is not fundamentally sound engineering will ever continue to be thought beautiful. The Eiffel Tower is perhaps a good example. Here was the tallest steel structure which had ever been built, so daring in conception that it remained the tallest for nearly half a century. It was designed with a distinct effort to make it æsthetically satisfactory but the very features which were so treated, notably the spread legs of the lower portion, were not based on good engineering principles and are today the most generally condemned portion of the building from the æs-

thetic as well as from the structural point of view. It is our belief that more good engineering projects are spoiled by false deference to assumed æsthetic considerations than by any economic requirements. No really clean, well-thought-out bridge, where the details have been carefully studied for good connections, proper bracing, and proper carrying of the loads, can be downright bad. It may not be exceedingly beautiful but at least it will never be very ugly; whereas the engineering structure whose function is partly concealed and partly distorted for supposed æsthetic reasons, will inevitably be unsuccessful. It does not seem to matter whether this distortion is the result of bringing in an architect so late that he never does understand what he is trying to do, or whether the engineer himself, having completed his basic design, feels that it needs something to doll it up and does what he thinks an architect would do if he had an architect in his employ. A good engineer may need no architectural associate, but, if he does, it is our purpose here to point out where collaboration with the architect should begin, what is his value, and what are his limitations.

2. Anchorages

THE design of anchorages for suspension spans is a problem which doesn't occur very often in engineering practice and still less often in architectural work, so that what we might call automatic design (the use of memory instead of imagination) is not quite so easy as in most other parts of bridge structure. Also, since the anchorage is of masonry, the architect naturally thinks he knows more about it than the engineer; the engineer, whose principal work is (these latter days) in steel, is inclined to agree with him, and-after he has worked out his foundations, his connections, and his loads-is willing to let the architect member of the partnership dress up the outside in pretty nearly any way that he thinks appropriate. Any architect who has worked with an engineer on an anchorage problem, or any engineer that has worked with an architect, will probably agree that this is a statement of fact, not just an assumption. In the design of the anchorages of three large bridges, the writer has had the good fortune to work in close association, and even in harmony, with the Engineer of Design, Mr. Allston Dana. In the course of this association, we believe that we have learned certain things which perhaps deserve to be



A litbograph rendering, made for Mr. Embury by John Richard Rowe, showing a proposed design for the anchorage of the George Washington Bridge in which an attempt was made to express in concrete the gigantic forces acting within the massive forms. This scheme was not adopted because it was felt, perhaps properly, that it would be out of character with existing contiguous masonry approaches along Riverside Drive



Figure 1. Plan of Triborough Bridge anchorage showing adaptation of existing anchorage for single cables

recorded. These anchorages, in the order in which we studied them, are those of the Triborough Bridge, the Whitestone Bridge and the George Washington Bridge. In all three of these cases we worked under the Chief Engineer of the Port of New York Authority, Mr. O. H. Ammann. While we had a pretty free hand to attempt anything that we pleased, we were always, of course, under his hands and the designs were subject to his criticism and never out of his control. We were, in a sense, his instruments and guided either by his knowledge or his desires, or by his direction as to the lines in which we should proceed. Of the three bridges, the first and the last had been begun when we approached the problem, the Whitestone anchorage being the only one designed de novo, so that far less latitude was possible in the Triborough and George Washington Bridges than in the Whitestone.

The work already in place in the Triborough Bridge, when Mr. O. H. Ammann was made Chief Engineer by the new Commission and we were employed to work up the design, was as indicated in Figure 2.

This anchorage was intended to hold four cables and the re-design of the bridges called for only two cables, the new attachment of the anchors to the concrete being effected as in Figure 1.

The architect, in this case, completely lacked all knowledge of how anchorages worked and what most bridge anchorages looked like, so that at least he was neither fettered by tradition nor hampered by knowledge. The information with which he was furnished conveyed no particular instructions as to how the Chief Engineer wanted the anchorage to look. The material was to be concrete with an exterior finish or surface treatment suitable to the material, and it was care-



Figure 2. Side Elevation of Triborough Bridge anchorage showing work already in place before redesign

fully explained to the architect by his engineer colleague that the cable of a suspension bridge, which is nearly horizontal at the anchorage, has to change direction and turn downwards into the earth pretty quickly, and that the large steel arms which were already constructed and sticking up from the anchorage were a sort of glorified clothes pole around which the cables were to be bent downward The front of the anchorage had to serve as a pier for the stiffening truss of the roadway and the back of the anchorage as the end pier of the viaduct. As will be seen from Figure 2, there was a considerable amount of existing concrete which was perhaps unnecessary in the re-designed bridge but which certainly had some function, and the foundations were in for every one of the breaks which were incorporated in the final design; although in the original design, as indicated in Figure 3, these bumps or breaks were pretty completely hidden.

To the original design we paid little attention. It didn't look to us like an anchorage for a bridge but rather like an 1870 Post Office unfortunately located in the flats, although anchorages of this type were quite the thing in the older days when the architect conceived his mission in life to be the covering up of the ugly structures designed by the engineers. We felt that we wanted our anchorage to look like an anchorage and nothing else, and we felt that, in a material like concrete, large plain surfaces were almost essential and that the only decoration that could be introduced were offsets or recesses which would cast sharp, hard shadows on the surface. We felt also that a structure of this kind must be treated without any attempt at conventional architectural ornament and especially without doors and windows which would at once lead the observer to believe the structure to



Figure 3. Side Elevation showing the original design for the Triborough Bridge Anchorage — now superseded



80

20 40 60

action of forces within the several distinct masses

be a hollow shell instead of the solid weight that it actually is. At the same time, in the design we felt it desirable to indicate what was actually the play of forces within this solid mass. While the scale and size of the members of the steel work are almost lacelike in relation to so great a block, we felt that it was somehow possible to design the surface of this mass in a way to indicate that it was a part of, and designed with, the steel which it supports.

Examination of the illustrations of the final design indicate the way in which we endeavored to solve the problem. The principal element acting in the anchorage is unquestionably the cable as it spreads out and is tied to the concrete mass which acts as a counter-poise to the weight of the bridge. This we tried to indicate by a series of diagonal fins in the concrete, following the lines of the spread of the cable and stepping out from above to below instead of battering. The rear of the anchorage has a double function. It is, in itself, both a weight to hold down the cable and a support for the ends of the first girders of the viaduct. We felt that a single great block of concrete without breaks of any kind would be not only a dull and uncompromising mass but would also show all discolorations, form marks, etc. to a much greater degree than if the mass were broken up by a surface treatment of some kind. Therefore, we treated this mass at the rear with vertical flutes of great width and large radius in a perhaps mistaken endeavor to indicate that this was an inert solid mass. At the rear of this is a half concrete bent to support the end of the viaduct and form a transition between this mass and the viaduct itself.

In other words, this design was made without reference to any precedent, either architectural or engineering, and solely on the basis of interpreting, on the exterior of the anchorage, its functions. Neither of us very much like the word "functional," but no other word seems to fit this kind of design quite so accurately. At any rate, these two great palecolored blocks seem to fulfill their function as they crouch at the ends of the bridge, strongly holding back the pull of the cables.

In the Whitestone Bridge there were no limitations of the design other than the requirements that the anchorage should both hold the ends of the cables and appear to hold them. The Chief Engineer, Mr. O. H. Ammann, had indicated his desire that this whole bridge should be smooth, sharp, and clean; that the stiffening trusses of the floor should be plate girders, that the towers should have no portal bracing near the roadway but only at the tops of the towers, and that these portals might take the form of an arch. We prepared for submission to Mr. Ammann, for his approval, several other anchorage designs based on more or less conventional lines before we happened to think of the particular form which was adopted. The principles upon which this is based are, roughly; that the forward side of the anchorage is battered at a slope perpendicular, or nearly perpendicular, to the slope of the cables at the point where they enter the anchorage, and that the anchorage itself should take approximately the form of the cables as they bend around the rocker arms and enter the concrete. It has been, in the past, customary to indicate the great loads at the rear ends of the anchorage by masses of concrete. In this particular case, the foundation conditions were very bad and it was necessary to go a considerable depth below the surface of the soil, no matter what anchorage design was adopted. As the whole mass had to be supported on caissons of very considerable depth, it was actually more

economical to use the weight of the whole of the anchorage as an anchor rather than to divide it into two parts, one of them being the lever or buttress at the bend of the cable and the other the anchorage proper. It is expected that a very considerable downward pressure will be exerted on the toe of this anchorage, a pressure much in excess of that at the rear or shore ends. This is due to the uplift of the cables, which are naturally anchored near the back, and the mass has been reduced, both for reasons of architectural effect and practical construction, to the extremely simple shape which exists in the finished design. See Fig. 5.



Figure 5. Whitestone Bridge Anchorage

We believe that the very simplicity of the design of this anchorage carries out the feel of the steel towers and stiffening girders of the bridge. Its decoration is reduced to four heavy flutes parallel with the batter of the inner face of the anchorage. Since a bridge anchorage, if seen at all, is almost inevitably seen from a considerable distance, we felt that any further breaking up of the mass was not only unnecessary but actually detrimental in that it would confuse the simple and very carefully studied proportion between the battered inner face and the gentle curve of the upper surface. The ornamental lines were placed as they are because we felt that, in a sense, the forces acting within the structure were analogous to pressing the ends of an accordion-that there is an actual attempt on the part of the cable to squeeze the structure together. We needed, of course, some construction joints, and neither horizontal nor vertical lines nor lines following the curve appeared to have either functional significance or a good æsthetic effect. We were perfectly conscious of the fact that this is an experiment, perhaps a pretty daring one, but we hope that the very boldness and stark simplicity of the mass will mark these anchorages as belonging to a bridge and to nothing else in the world.

The George Washington Bridge offered an entirely different problem from either of the other two anchorages. In the first place, there is no sloping approach viaduct. The anchorages are so close to the high ground to the east of Riverside Drive that the only approach on the New York side is a single arch across Riverside Drive. On the New Jersey side there is no viaduct at all; the anchorage there is cut out of the solid rock of the Palisades. When the bridge was built, a treatment of the exterior of the anchorage was designed as in Figure 6, but funds would not permit its full construction at that time and its completion was postponed until such a time as the lower deck of the bridge became necessary because of traffic conditions. There was constructed, therefore, only enough of the rough concrete core to anchor the loads required by the single deck and such foundation work as was expected to be required in the design by the original architect (the late Mr. Cass Gilbert). Its present condition is indicated in Figure 7.

During the years that the bridge has been in use it has become apparent, because of the



Figure 6. Cass Gilbert's design for anchorage of George Washington Bridge



Two renderings of designs for the completion of the anchorage of the George Washington Bridge, corresponding to Figures 8 and 9. The accepted design, above, is preferred as being more in character with existing masonry structures—retaining walls, etc.—along Riverside Drive. Compare these with drawing on page 111



THE AESTHETICS OF BRIDGE DESIGN



Figure 7. Existing condition of anchorage for George Washington Bridge

excellent plan, that the single deck could carry traffic far in excess of that believed to be possible at the time of its erection. The date of construction of the lower deck has therefore been postponed to a rather remote future. The existing anchorage is far from being an ornamental structure, partly because the shapes were not studied to be exposed and partly because it is surrounded by light steel construction designed to support the roadway until the completion of the anchorage. With the construction of the new West Side Improvement, the Port of New York Authority has felt it more and more a duty to improve the appearance of the anchorage, regardless of the fact that it is functionally adequate, and we were requested to prepare, under the direction of the Chief Engineer, Mr. O. H. Ammann, a design for its completion. Our studies have resulted in the preparation of two alternate designs, neither of which has, at the time of writing, been adopted as final. Both of them are included in this article because they illustrate two different and equally logical avenues of æsthetic approach. Were this anchorage a free standing structure, entirely separated from the tremendous retaining walls which exist at the east of Riverside Drive at this point, we believe there would be only one; that is, the anchorage should be designed with an eye solely to its relation to the magnificent steel structure of which it forms an integral part. However, this anchorage is only about one hundred and fifty feet distant at its land end from a masonry structure even larger than itself and to which it is connected by a masonry arch bridge, so that the whole anchorage may be regarded as an artificial promontory jutting out from the west of Riverside Drive to meet the steel structure. This was the point of view taken by Mr. Cass Gilbert in his design. He

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regarded this whole piece of mason work as a great square block extending out from the retaining wall and having little or no relation in scale or character to the steel work of the bridge. As a matter of fact, this is precisely what occurs on the New Jersey side where the cables are anchored into the cliffs, which, being purely natural formations, have no relation whatever to the completely artificial bridge structure entering them.

The other avenue of approach is that this structure is not an inert mass of masonry which happens to be able to do what is required of it, but is a live, articulate structure in which the forces are constantly acting with varying strength as the loads both from traffic and from wind change on the bridge itself. However, its location so near to the Riverside Drive retaining wall makes essential some homogeneity between the shore structure and the anchorage, as Mr. Ammann himself very forcibly has pointed out to us.

This is perhaps a good point at which to discuss why Mr. Cass Gilbert's original design was not retained without any material alteration, not only because of its effect on this particular design, but because the factors which induced us to suggest alternate schemes are those which obtain in all anchorages of any magnitude. By reference to the illustration, Figure 7, it will be seen that the original design contemplated the use of great rough granite blocks decorated with quoined pilasters of dressed granite and supplemented by an arcade which continued not only over the anchorage but over the connecting bridge to the approach plaza. Here is a perfectly traditional method of design adapted as far as possible to a new condition, but with a result which we believe, from the very nature of things, to be an anachronism in a modern steel bridge. In the first place, the very bulk



Figure 8. Accepted design for anchorage of George Washington Bridge

of the structure indicates to us the need for smooth, unbroken surfaces and any ashlar surface composed of units-which, no matter what their size as ordinary building stone, are here relatively tiny-suggests building construction rather than a solid mass. Second, the increase in the size of these stones from those of the ordinary building units tends to decrease the apparent size of the anchorage because we are accustomed to a certain size of stone in rough ashlar and where this is thirty courses high we feel that it must be thirty courses of the ordinary size and not thirty of the great units here proposed. In the third place, the arcade, which is actually an ornamental treatment along the top of the anchorage, intended to extend to the lower deck when built, suggests a hollow building. Fourth, the decoration with quoins and cornices, even reduced to a minimum as they are in this case, are so obviously derived from hollow structures and so disassociated in all our memories from steel work that they cannot possibly be reconciled in scale and character with the design of the balance of the bridge. A similar question occurs in the Philadelphia-Camden Bridge where the architect, Mr. Paul P. Cret, one of the most distinguished and progressive architects in America, approached his anchorage design along the same direction. He used great rough blocks of ashlar to face the anchorage, endeavoring by the size and roughness to give it a feeling of strength, built two towers at the rear of the anchorage to indicate the point of greatest load, and decorated the whole mass with moldings and openings, not very classic it is true, but derived from classic sources. The result is that the structure, no matter how one may feel about it as a separate entity, is a failure at this particular point, since compared with the terrific scale of the towers and steel work it becomes trivial, and further, the introduction of windows and doors with a type of stone work associated in our minds with hollow structures indicates a hollow structure rather than a solid block. The building might be a magnificent warehouse or a superb old fortress but it certainly is not an anchorage.

In the new designs, Figures 8 and 9 respectively, we have endeavored to bear all these points in mind. The design illustrated in Figure 8 is distinctly based on the "Promontory" conception of the anchorage. It is an extension across Riverside Drive of the retaining walls to the solid block of the anchorage. We have used for the main portion of the structure the same sort of fairly rough



Figure 9. Proposed design intended to express play of stresses within anchorage

stone work in small units that is used on the retaining walls, believing that we can thus produce a continuous surface and not a broken one as would be the result of using ashlar. In place of the masonry arcade we have substituted a steel viaduct indicating as plainly as we could the entire difference of function between the upper portion of the structure, a viaduct, and the lower portion, a solid inert mass. This particular anchorage is actually composed of two separate elements (as may be seen from Figure 7) which shows its present condition. The forward or lever portion of the anchorage is actually a buttress around which the cable is bent. The rear portion is the weight, the block of masonry which holds the terrific loads of this span. While in this design it is impossible to express completely the functions of the two portions of the existing structure, an attempt has been made to show at least that something went on inside it by the treatment of the side elevation in three battered planes broken inward toward the cables, the one toward the river encasing the buttresses only. Because the function of this part is actually different from that of the balance of the anchorages, we have chosen an encasing material of smooth granite with very small joints in very big panels so that it would form an intermediate link between the hard smooth outlines of the steel and the softer and rougher mason work of the anchorage proper and the Riverside Drive retaining wall.

This design has, to us, two difficulties. First, the cable hits the top of the anchorage at a point considerably remote from its end; thus, so far as this be seen, almost anywhere along the top of the anchorage might be an equally good place for the cable to end. The same thing is true of the original design. There is no recognition whatever of the fact that this whole mass of masonry was built around a cable, that its sole reason for existence is the cable. The second reason we don't entirely like this design is because we are not entirely satisfied with its general proportions. It is pretty wide for its length and while we have made at least fifty studies in an endeavor to produce a side elevation which pleased the eye more than this one, we have been unable to find anything as good.

The last of the schemes described, the one shown in Figure 9, is based primarily on what an anchorage does. We all like to know how things work, whether they are locomotives or radios or bridges, and if we can show by forms which are beautiful in themselves how the things work and then in some way tie it to its surroundings, we feel that we have accom-

plished exactly our heart's desire. The encasing at no point diverges very far from the actual structure now in place. Instead of the stepped river end of the buttress, we have used a curved form, suggestive of the spiral, which happens to parallel pretty closely the line of force acting through this concrete buttress. The spread of the cables is exposed and the encasement of the I-bars in concrete is indicated by incised lines in the concrete radiating from a center at the point where the strands begin to be divided. We have endeavored to indicate that the masonry above the I-bars is placed there for weight alone, by horizontal pour lines recessed in the concrete. We have regarded the bridge as being an intermediate link between the anchorage and the retaining walls and have treated the viaduct in substantially the same way as on the other design except that the big span over the cables, where the columns would have had to be very long. has been carried on a plate girder. This design, like the other, has been studied with very great care to bring out its strength and disguise its weaknesses. We have not been able to tie the anchorage into Riverside Drive in the easy fluent way we would like to see and, as seen from Riverside Drive itself, our perspective studies show that treatment of the buttress as a separate entity tends to confuse somewhat its function, so that the question as to which of these two anchorages is the better seems to us to depend on two things. First, which is going to be the more interesting structure as seen from the new West Side Driveway and existing Riverside Drive and, second, which of these two structures is the better intermediate link between the mason work along Riverside Drive and the bridge itself. On these points neither the writer nor the Chief Engineer have made up their minds.

While this discussion has been concerned primarily with the three bridges upon which we have worked, there are, we believe, certain points which are applicable to all bridges. We think that it is true that no forms derived from ordinary masonry building construction are applicable to structures in close conjunction with steel work of great size, which means that any anchorages, piers, foundations, or abutments for steel structures must not be reminiscent of classic architecture but designed, as it were, out of whole cloth. This constitutes a fairly difficult problem; it is always easier to remember than to invent, and further, in determining what shape will be artistically successful, we have not the guide of intelligent public opinion informed through years of familiarity with similar structures.



The perspective rendering, above, of the design for the new Whitestone Bridge anchorage, emphasizes its absolute simplicity and its almost perfect expression of its function and of the lines of forces acting within its mass. Below is a photograph of the Triborough Bridge anchorage showing the steel strut, around which the cable changes its direction, above the bridgeway



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We believe that, in general, any form which does what it is supposed to do without waste and without ornament will, if not positively good, be reasonably successful. There are, however, certain artistic instincts in human beings which lead us to special forms. The circle and the square are both natural forms which almost everybody likes. We don't know why. The same thing is true to a lesser extent of all the curves of a simple equation. For example, most people will prefer an ellipse to the compound curve of a three-centered arch and between several three-centered arches will prefer that which approximates the ellipse most closely. A true spiral almost always gives us a pleasing impression. When we come to other than very simple forms, there will inevitably be differences of opinion. To take an elementary example, no two people will like the same relation between the height and breadth of doors, so when we come to complex arrangements of planes (simple though they may appear after they have been designed) as we have used them on these anchorages, we feel that we are rather groping toward a conclusion than that we have definitely arrived at one. Take, for example, the anchorage of the Whitestone Bridge. The batter of the front face was studied over and over again in its relation to the curve of the rear and we have now a shape which pleases us both. We don't know why. Having arrived at this simple form, we tried treatments of the surface in every manner that we could imagine, by horizontal lines, by curved lines, by vertical lines. We finally adopted the slightly sloped lines indicated on the design. Again, we don't know why. In the second design for the anchorage of the George Washington Bridge, we did have pretty definite elements to guide us. The anchorage actually shows what it does without any padding of concrete here or cutting off there to produce a false impression, but we felt also that very slight changes in the curve of the front of the concrete rocker, in the width of the splay enclosing the I-bar anchors, or in the relation of the incised lines by which the surface has been decorated, materially changed the effect of the structure. Naturally we picked that combination which we thought was the best and in our collaboration on these designs, it has, as a rule, been the architect who has suggested and the engineer who acted as the artistic critic, a reversal of function which has somewhat surprised us.



Richard Averill Smith

Photographic view of completed anchorage, Triborough Bridge, New York

"AND DELIGHT"

BY RALPH WALKER, F. A. I. A.

"WELL building hath three conditions: commodity, firmness and delight."

When that quaint remark was first used to describe architecture, a literature on the subject was stated in a manner so simple, so clean, and withal so sensibly, that one wonders at all the subsequent high-powered and obscure maunderings on what architecture might mean. It is refreshing in its true simplicity. In it there is no discussion of materials, or tools, or methods. It bases its definitions upon the reaction to what man himself requires, his well-being translated into well-building. Here are no terms which can not be defined in well understood habits of thought.

* * *

In the world of today's architecture, "and delight" is too often lost to sight, and this is true largely because of the influence of a glittering alliteration which, when examined, bears out that old axiomatic bromide "all that glitters is not gold."

"Form follows function."

Louis Sullivan, having nailed that slogan to the masthead of a proposed new ship of democratic architecture, calmly forsook the bark and sailed his own way disregarding it and making forms which appealed to his "celtoimagination," and certainly "his less dear pupil" has attained a quality of design which springs more from the soul of poetry than from any real achievement of function.

And why should architects be ashamed of the fact that a poetic approach is necessary to appeal to that "delight" which makes up the fine quality of man's emotions? Why should the stress in modern thinking be continually upon the creature comforts and so little upon the possibility of obtaining the mental and spiritual stimuli which we so sorely need today?

Why should the stress be upon the limitations which the machine age has put upon us and not upon its marvelous possibilities? Why not stress the point that the machine means freedom to ideas?

Why should a ban be put upon individual

efforts, even though they may be doomed to failure? And why should we wait for the opportunity for further experimentation until such time when the social requirements of a society have become fixed (so fixed that no further experimenting in that cycle or social order is necessary)?

Why should we assume that our age is any more confusing, any more chaotic to us, than other ages were to the people who lived in them?

But again, why should we think of or be contented with an "escape architecture"?

THOUGHT, DESIRE, DELIGHT — ALL SHOULD BE POSITIVE, NOT NEGATIVE.

* * * * *

The work of Frank Lloyd Wright as presented in the January "Forum" still illustrates the joy of creative design which has made Wright so outstanding.

The designs have their faults, but in them and through them runs the thread of the creator's "delight" and his concern for the "delight" of others.

Here is no so-called functional fixation for the use of materials. Here is an architect attaining such efficiency as his nature and his knowledge permits, but not using a ribbon window or a cantilever because a Lewis Mumford (as one example) had told him that unless he does he will be damned for failing to use the accepted forms of modernity, a Lewis Mumford's modernity. (How THE SELF-RIGHTEOUS CONTINUE CONSTANT IN THE RECREATING OF HELLFIRES!)

The great value of Wright in our modern world is that he does not *conform*, that it is impossible for him to think in negative terms.

He is not confused by the world, he retires from it only to gain strength to understand it, to dominate it.

He is much more the poet than the engineer, so that his structures achieve drama rather than mere necessity.

He designs to please his own sense of fitness and therefore he creates and does not imitate. The international style has negated more imagination and has created more imitation throughout the world than any other architectural movement in the history of mankind.

Its acceptance has within it more danger of stifling man's creative sense than all the aimless and stupid copying of the past, because at least the past is an infinite storehouse of ideas, whereas the paucity as to the number and the ease with which the modern ideas are copied is a powerful sedative.

The architect who drains that cup of imitational hemlock has committed an emotional mayhem upon the one thing which makes him an architect, which separates him from the mere shelter producer—his imagination. It is only in the free play of imagination that "delight" results.

To return to today's confusion: The attempts we make at an understanding of the confusion, which exists without doubt, has the exceptional value of sharpening our mental reactions to the false qualities within it.

A plea for quietness and repose in the modern world is in line with the oriental characteristics of horizontality which in the orient resulted in two thousand years of general stagnation. Consider this thought: Michelangelo and repose, or again Madame Curie and repose. Repose is only possible from within and not from without.

"Technology has constructed man, not according to the spirit of science, but according to erroneous metaphysical conceptions." But I prefer the poet's reactions to man's needs rather than those of the technologist.

The technologist swallows the "form follows function" fallacy wholeheartedly, failing to admit, however, that function on the average attains only, even today, about 5% of its efficiency possibilities.

The efficiency of function in relation to man's need is low in comparison to the poet's understanding of man's sources of "delight."

It is on the basis of the poet's understanding of human relations that the world may finally integrate successfully man and his ill-composed works.

* * *

Why is it, in a world where man is searching constantly for new ideas, the architect is always so ready to copy, so ready to take what exists for the moment rather than to make the effort of a search for himself?

No revolution is necessary in a world in which everyone admits the positive urge for the individual to create.

There is no such thing as society creating anything. The artist is the drum-major of civilization and society follows one artistcreator after another. Society is rarely prepared to accept new creative values.

It is only when a group of individuals, widely diverse in searching or in opinion, indicate the horizons of a period that it becomes a part of society. Society more often than not plays the part of Esau, more interested in the immediate rather than quality.

The international style is itself a copy of the American factory which was created for the special purpose of "saving-a-penny economy" rather than the improvement of human effort, and if the factory design resulted in human benefits it was largely accidental.

Recently the Van Nelle plant in Holland was touted for its functionalism, but on examination it proves to be an advertising functionalism rather than something for the workers. Behind the great glass façade, which says daylight, the workers are placed in the middle bay away from the glare and in the shadows of the moving buckets of the conveyor. Bright — dark — bright — dark — the rhythm of the light. Functionalism? Nonsense!

* * *

Another glitter— "Disregard Taste."

Taste is discrimination in delight. It is a sensitive understanding of comparative values.

Only people without discrimination, without sensory judgment decry taste. Simply put —they are tasteless.

Taste is a necessary measure of human activity. It is the pure distillation left in the test tube of delight after burning off the mass of human effort. One need not be an æsthete to appreciate the difference between "white mule" and fine bourbon.

It is not for the architect to admit a standard of appreciation based on "white mule" (to which much of modern architecture has a resemblance). A group of bookplates designed and drawn by Arthur A. Stoughton, Architect, who has made a hobby of pen-andink drawing and, as may be seen, has achieved considerable skill in handling the medium









Some of Mr. Stoughton's bookplates are built around architectural motives, others depict the owner's favorite landscape, while still others introduce symbolism. All of them are well-studied and appropriate for their purpose





FEBRUARY 1938