

GETTING TOGETHER

THE architectural club or similar organization, composed of draftsmen—preferably with the support and interest of the men who can be of the greatest value in making the organization helpful, the best architects in the community—is, we believe, the strongest force for the good of the draftsman in general and individually. Many of these clubs in widely separated cities are doing a splendid work—providing instructive and entertaining talks by men whose experience has made them able to talk helpfully on subjects relating to architecture and the allied arts; maintaining ateliers allied with the Beaux Arts Institute of Design; holding social gatherings; taking an interest in the civic welfare of their communities, and doing many other things for the benefit of their members, for the profession in general and for the maintenance of high standards in civic art.

Where clubs of this kind exist, they should have as members all draftsmen who are acceptable, all the men who have their own improvement or that of others at heart.

Where such clubs do not exist they should, we believe, be formed promptly. It takes only a handful of men to form an atelier, some architect of suitable standing can be found to become patron, and an atelier can be formed. The question of expense need not stand in the way of starting; quarters in which to meet are likely to be made available with surprising readiness if the desire to study systematically and earnestly is made known, and the best architect is usually the first to take an interest in such a plan and the most ready to give, as patron, his time, the inspiration of his personality, and the results of his own training and experience. Also the best architects in the town or city and in nearby cities will be found the most ready in responding to invitations to talk before the club as soon as a membership of any considerable size has been secured.

The social features can come later, at first an occasional outing, then perhaps a club room or even a club house, with facilities for dancing, billiards, cards, reading and talking. But inability to have at once all the advantages of the older clubs in the big cities should not prevent the making of a start.

It is safe to say that all existing clubs of this kind could improve very greatly by exchanging ideas with similar clubs, on club programs and edu-

cational programs particularly. A medium for this exchange now exists, PENCIL POINTS, and all clubs are invited to make use of it by sending in news of their plans and activities and in turn reading what the clubs in other places are doing. Considerable information along these lines can be gleaned from the letters from clubs in various parts of the country already printed in the pages of this journal. It is obvious that the amount of this kind of matter depends on the response to the invitation to send it in—if each club contributes items and reports there will be a great deal of helpful matter for all.

Therefore, if you are not a club member, we suggest getting in touch with the organization in your community. If there is no atelier or club, better start one; don't you think so? If you are a club member, as well as a reader of PENCIL POINTS, won't you do what you can to promote this exchange of ideas?

Getting together is the best way to make progress along any line. Though a man may learn by studying alone, or a club may do good work without knowing what other clubs are doing, both the student and the club will go ahead much faster by availing themselves of the advantages of association.

In the case of the student the atelier provides not only the guidance of the patron and a systematic course of study but also the inspiration derived from contact with other men who are striving to learn and to develop along the same lines as himself. This spurs the student to effort in competition with his fellows and if the atelier is connected with the Beaux-Arts Institute of Design he has the opportunity to match his ability in the concours against that of men in all parts of the country, a further incentive to effort.

In the case of the club, it is advantageous not only to exchange club programs and educational programs but to exchange ideas in general that cannot well be classified under either of these headings. The exchange of ideas among clubs does, in fact, very much the same thing as the association of individuals in a club does—it stimulates to greater effort.

All over the country men are thinking and working towards the improvement of their own ability, and for the benefit of the architectural profession.

PRESENTATION DRAWINGS, PART II

BY FRANCIS S. SWALES

THE amount of detail to be shown, the degree of finality to be suggested, the mode of treatment of the subject, whether the drawing is to be of large or small scale and whether in itself it is to be a large or small drawing, must be determined, as well as the medium and time available for execution, before technique can be decided upon in any case.

Whether ordinary good sense is to be exercised and some account taken of the perception of the parties to whom the drawing is to be presented, or it is to be made "regardless," for the edification of the student who may see it at an exhibition or reproduced in a magazine, should depend somewhat on the architectural worth of the subject and a great deal upon the quality and texture of material employed.

Thus, fine classic structures, such as Mr. Pope's Scottish Rite Temple at Washington and Mr. Swartwout's memorial to Mrs. Eddy, seem to demand a technique of the same scholarly character as the design in order to properly express the refinement which is the essence of the design. Drawing as fine as a machine might make it, and rendering in softly graded washes to suggest the

fine quality of material and finish, are important for record and study purposes quite as much as for those of presentation.

Structures in which elaborate ornamentation is an important characteristic, as, for example, Mr. Goodhue's interpretations of the Gothic style, require a less serious and less defined drawing. A smooth wash drawing of an English Gothic reredos

looks like an illustration from a catalogue of cast iron radiators. Indication of wall texture is as essential to the drawing as actual texture is to the building. The hardness of form, crispness of detail, the obvious fact that the construction is an anachronism, require a dramatic style of drawing. For such purpose nothing equals the etching as a medium, but as it is a most difficult one to master, perhaps the

nearest approach that an architectural draftsman may attempt is the pen-and-ink rendering. The use of perspective is essential for presentation drawings for buildings which are "in the style of an ancient moral play." To give the design its proper atmosphere requires the use of a freehand line to suggest the mellow effect of age without which the Gothic style is like "Hamlet *sans* Ham-

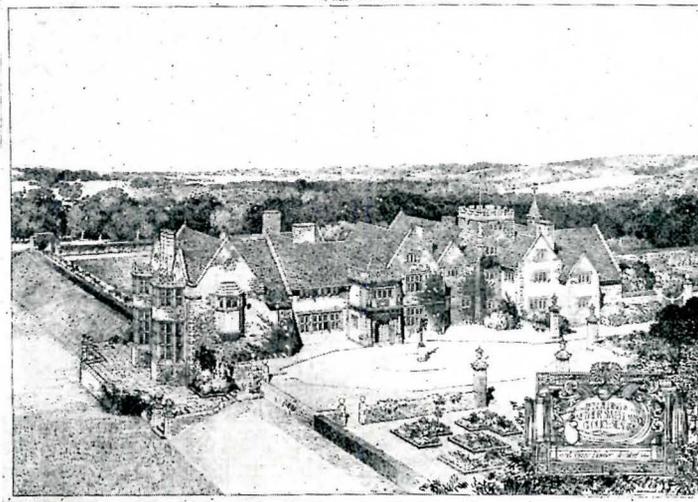


Figure 10. An English Drawing showing strongest contrasts in vertical shadows and strongest dark at end of picture, in toliage at right. From *The Builder*, London

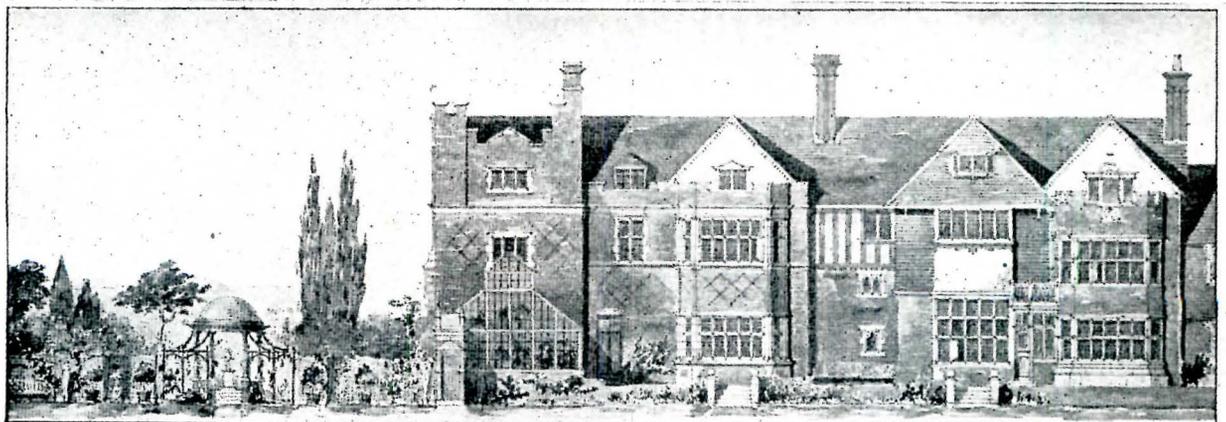


Figure 11. English Drawing with strong vertical shadows

PENCIL POINTS

let." For small drawings of churches and the ecclesiastical type of school the very fine line, the method of cross-hatching, and the old English scenery—to form the setting—as used by Mr. Goodhue, is as good a model as can be found—approaching the fine dry point work of Chahine.

It is not intended to imply that pen-and-ink is an easy medium by which to express an architectural idea, except as relatively to the etching, or the finely graded wash drawing. Since Harvey Ellis was at his zenith—when he made wonderful pen drawings of rustic masonry and Richardsonian architecture—and Joseph Pennell took to impressionism, Goodhue has been, in the writer's opinion, the leading exponent of pen-and-ink rendering of picturesque subjects in this country. A comparison of some of his early work with his best will convince any draftsman that "some is better than others" and that this medium is not one to be mastered without much experience and practice.

D. A. Gregg has had a much greater influence on American draftsmen as his style was more methodical and more adaptable to different styles of architecture, and an easier model for beginners. His use of three different widths of pen point for the different distance planes, gradations of tones and careful spacing of lines are useful methods to bear in mind in employing any line medium.

With reference to perspectives in particular, though with all rendered drawings, and irrespective of medium employed, a difference of method between English, French and American draftsmen is worth observing: The strongest contrast in American drawings is usually in the foreground, in French drawings at the centre of the picture or

at the main entrance, while in English drawings it appears towards one end of the building. The strongest *dark* in English drawings is almost invariably placed in the principal vertical shadows on the building, often causing the illusion of cracks or holes in the wall. (Figures 10 and 11.)

When circumstances permit or call for a large scale drawing, charcoal, soft lead pencil or pastels offer easier and more sympathetic means of indication of subjects not requiring much detail. The principal disadvantage with them is that they are too easily smudged, and another objection is the soft brittleness of pastels, so troublesome when endeavoring to obtain a transparent tone. When the object of the drawing or sketch is merely to illustrate tentative ideas, or variations of a given idea, a combination of media, such as water color and crayon, or the use of such soft media for the broad parts and a harder one, pencil or ink line, for the detailed or architectural parts, is often to be preferred to any single medium.

As instances may be taken the cases of landscape or garden architecture (see Figure 12), and extensions to existing buildings. The presentation sketches may have to be made to indicate an ultimate scheme and a number of stages by which such ultimate design may be developed. The sketches of the Chateau Frontenac illustrate such a case in actual practice. The buildings to which the extensions were required consisted of three groups of structures erected at different times, each with little regard to that which had preceded it, and of different type of construction, style of design, scale, level of floors, etc. Each had its separate elevators and stairs and the three were "hooked" together by

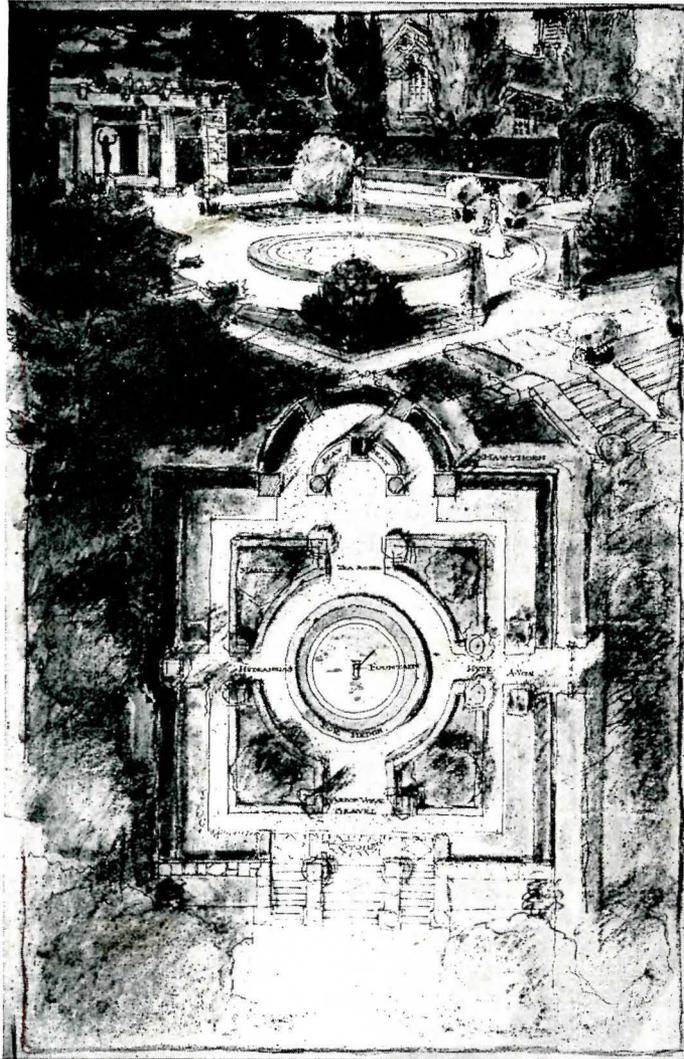
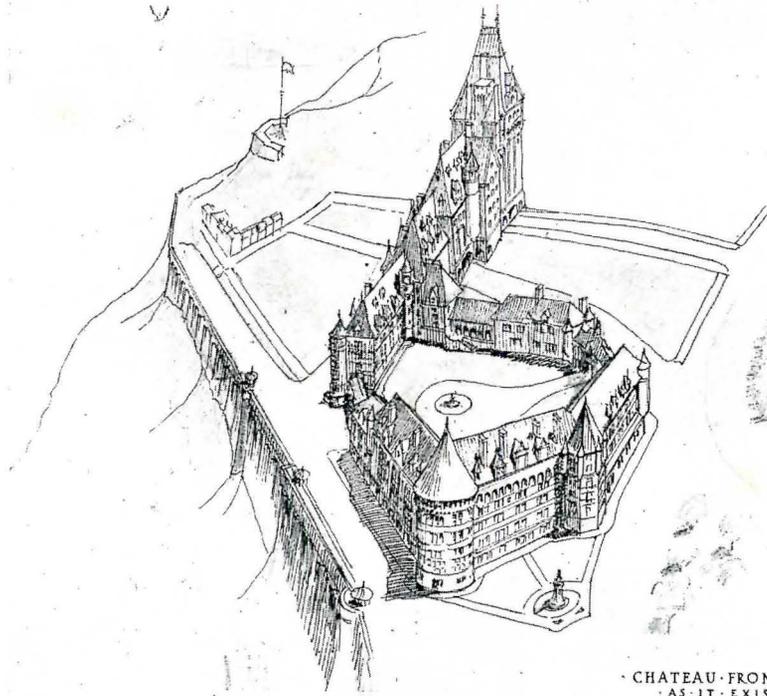


Figure 12. Large scale, quick, freehand sketch of a small Garden to show planting. Drawn with a fountain pen, slightly rendered in color and touched up with charcoal, it illustrates use of combination of media.

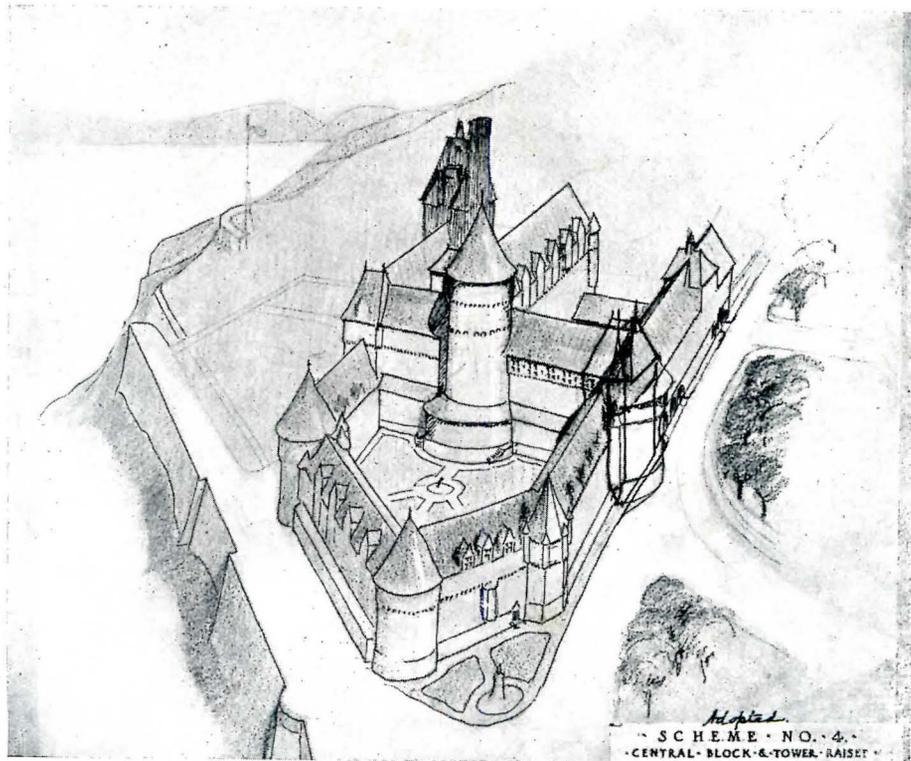
By Francis S. Swales

PENCIL POINTS



CHATEAU FRONTENAC
AS IT EXISTS

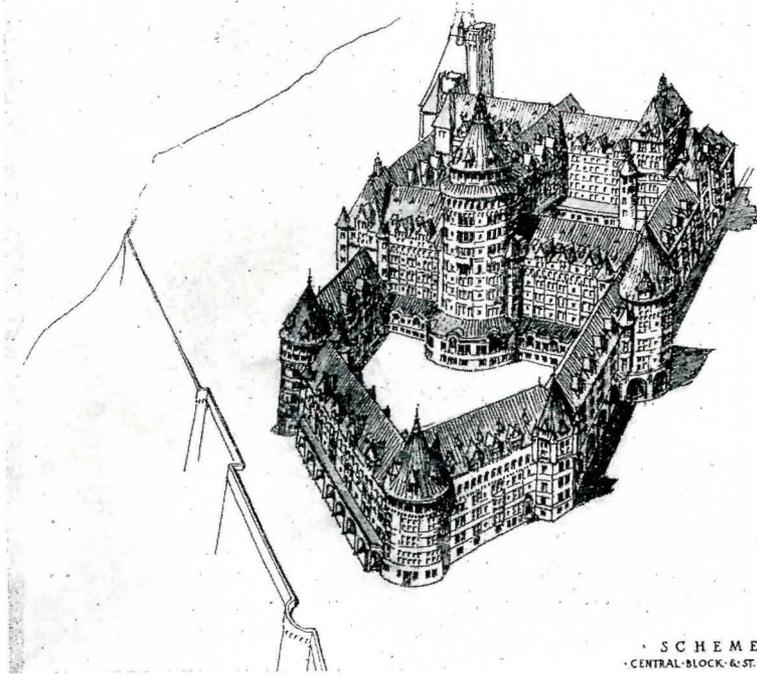
Figure 13



Adapted.
SCHEME NO. 4
CENTRAL BLOCK & TOWER RAISED

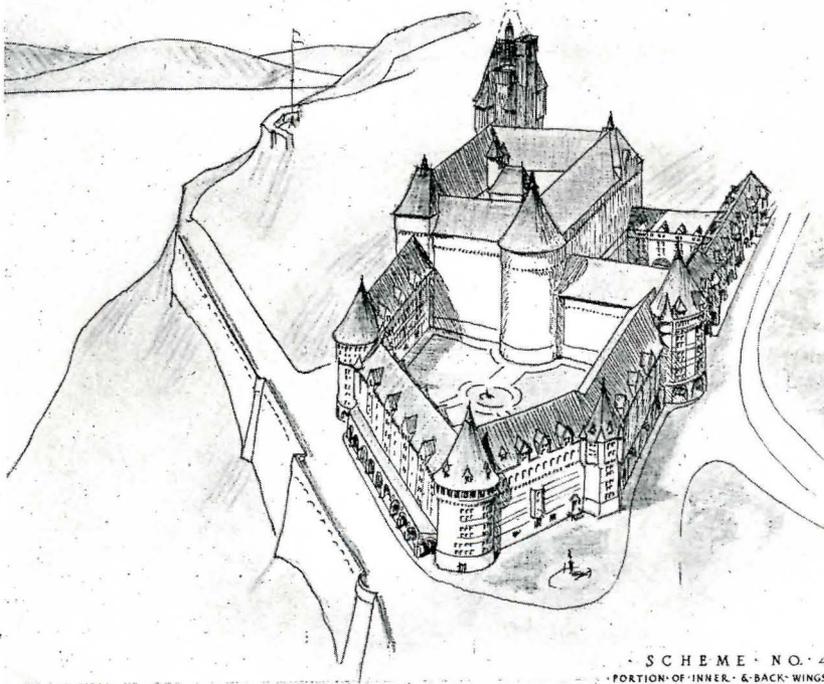
Figure 14

PENCIL POINTS



· SCHEME · NO. · 4 ·
· CENTRAL-BLOCK · & · ST. LOUIS-WING-RAISED ·

Figure 15



· SCHEME · NO. · 4 ·
· PORTION OF INNER- & BACK-WINGS-RAISED ·

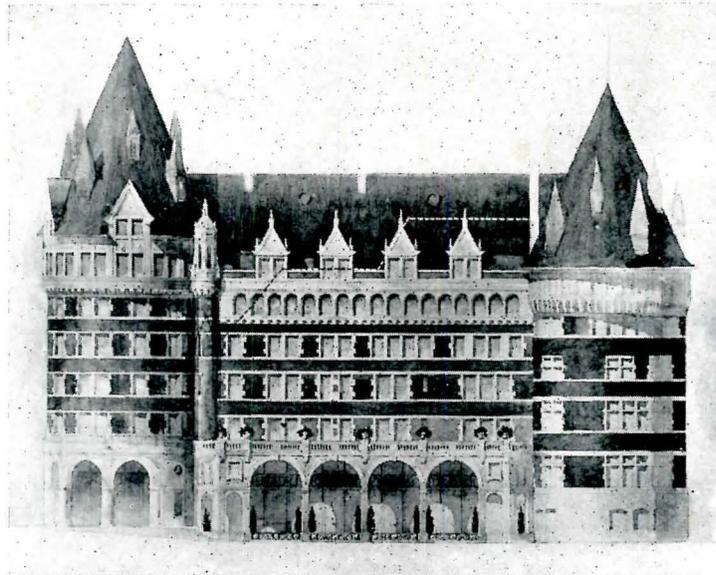
Figure 16

PENCIL POINTS

means of bridges. The difference of levels, of which the extremes occurred on the diagonal of the site, was about twenty-five feet. Several different officers or employees of the company, each with some fixed idea had to be consulted, and some directors, whom it would not have been politic to ignore, took an "unofficial and private interest" in the designing. National, Provincial and City authorities were interested in the boundaries of,

rights of way through, and servitudes upon the site—all of which premises are by way of informing the designer experienced only with a troublesome lady client, that the problems of "the fellow with the big jobs" are not exclusively the technique of presentation drawings, refinement of proportions and making a decorative plan, in order to secure instructions to proceed with a free hand. In the case of the Chateau it became necessary to illustrate nearly a dozen schemes, or variations, in order to meet, or eliminate ideas of men who neither understood planning nor were able to read a plan (the usual case with laymen), but who were committed to agreements which might be affected by the building extensions. The idea of using "air-plane views" (Figures 13 to 16 inclusive), shown by means of quite small free-hand sketches made on sheets of ordinary writing paper, showing the existing buildings in ink and new parts, which were in lead pencil, afterward touched up with a fountain pen, proved more interesting and intelligible to the officials than large, well-made drawings of plans and elevations which had been rendered by a Paris Prize draftsman; or than a finished perspective which had been colored by one of the best specialists in rendering in this country. The small size of the sketches made it possible to lay all of them side by side, on the desk of an official, showing the pros and cons of each scheme. Nothing but the general composition of the several wings was shown in the sketch which found most favor, and from which the working drawings were finally authorized. Photographic prints were made of the small sketch and subsequent alterations were made upon the officials' copies in their presence, with a fountain pen.

An elevation of a building with a high roof will



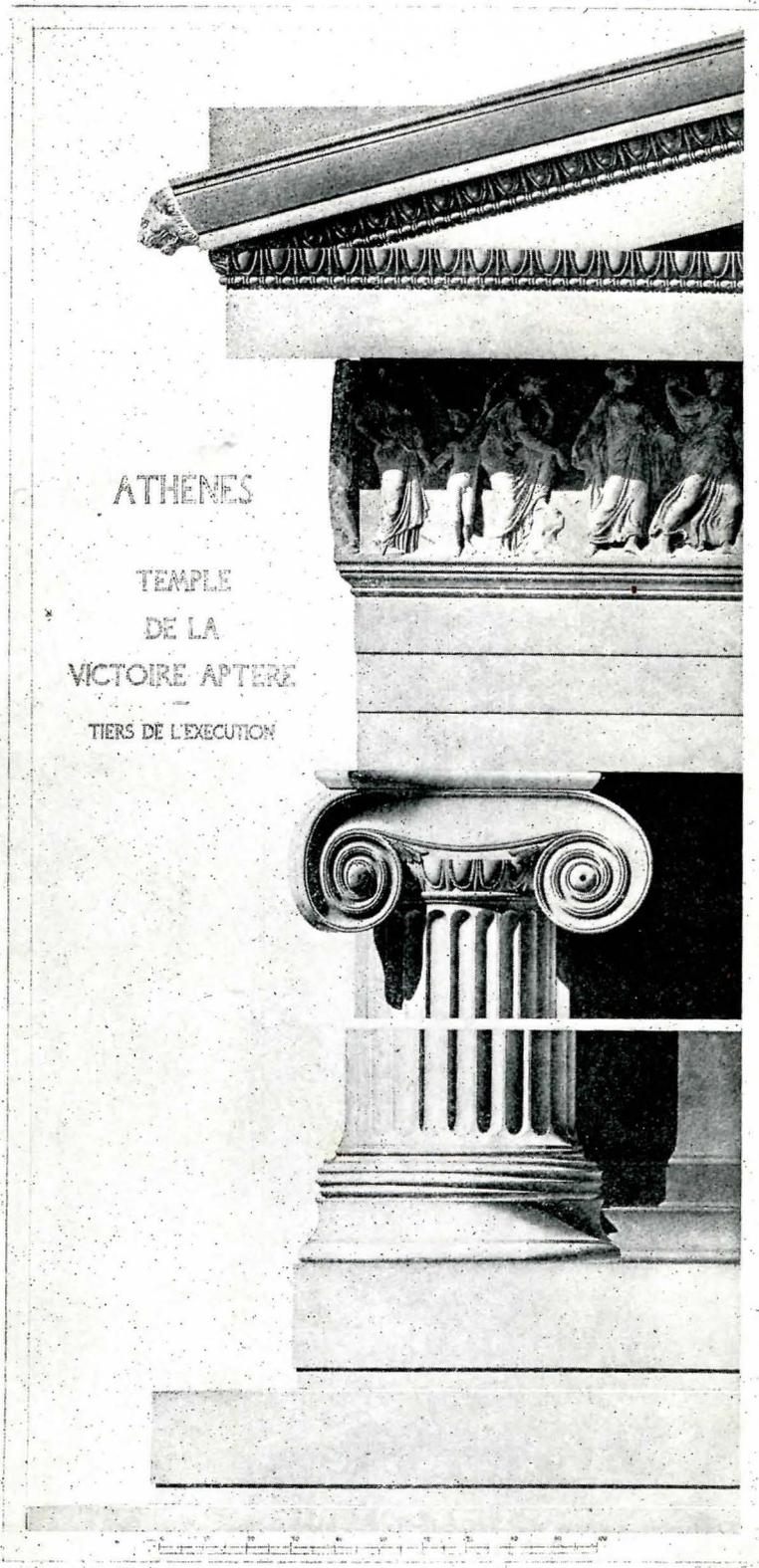
A "Change" Drawing, Elevation of Chateau Frontenac, Quebec. Study for tower, upper stories and arcade by Francis S. Swales

planning and effective composition.

Technique is a matter of purpose as much as design. From the business point of view the immediate object is to so express an idea as to secure business—to make money. One does not need to have much experience in life to know that nothing ends with the accomplishment of an immediate object. It leads but to the next, and to the question of the ultimate object and the answer, "Somebody's pleasure."

The greatest pleasure to the greatest number—some taking posterity into consideration, while others limit their efforts to only the number of today—is the ultimate object of every desirable human endeavor. The architect or client who considers nothing but his immediate object or personal pleasure commits an act against public welfare; and while it is indubitable that the vast majority of buildings erected on this continent constitute such an act, it is equally certain that the person who is sufficiently civilized to become a client of an architect never really intends his building to do so. The draftsman who finds pleasure in producing good drawings and the student who finds it in studying them are entitled to as much pleasure of this kind as circumstances permit. But consideration on the part of the draftsman of the parties to whom the drawing must be submitted, is more often needed than heeded. Fine drawings undoubtedly assist in developing fine feeling—refinement in the draftsman and designer. Perhaps some day we shall have a *Salon* instead of "Architectural Exhibitions," which consist mostly of enlargements of photographic views of trees with country houses in the middle distance. Then it may be worth while to make special exhibition

(Continued on page 27)



ATHENES

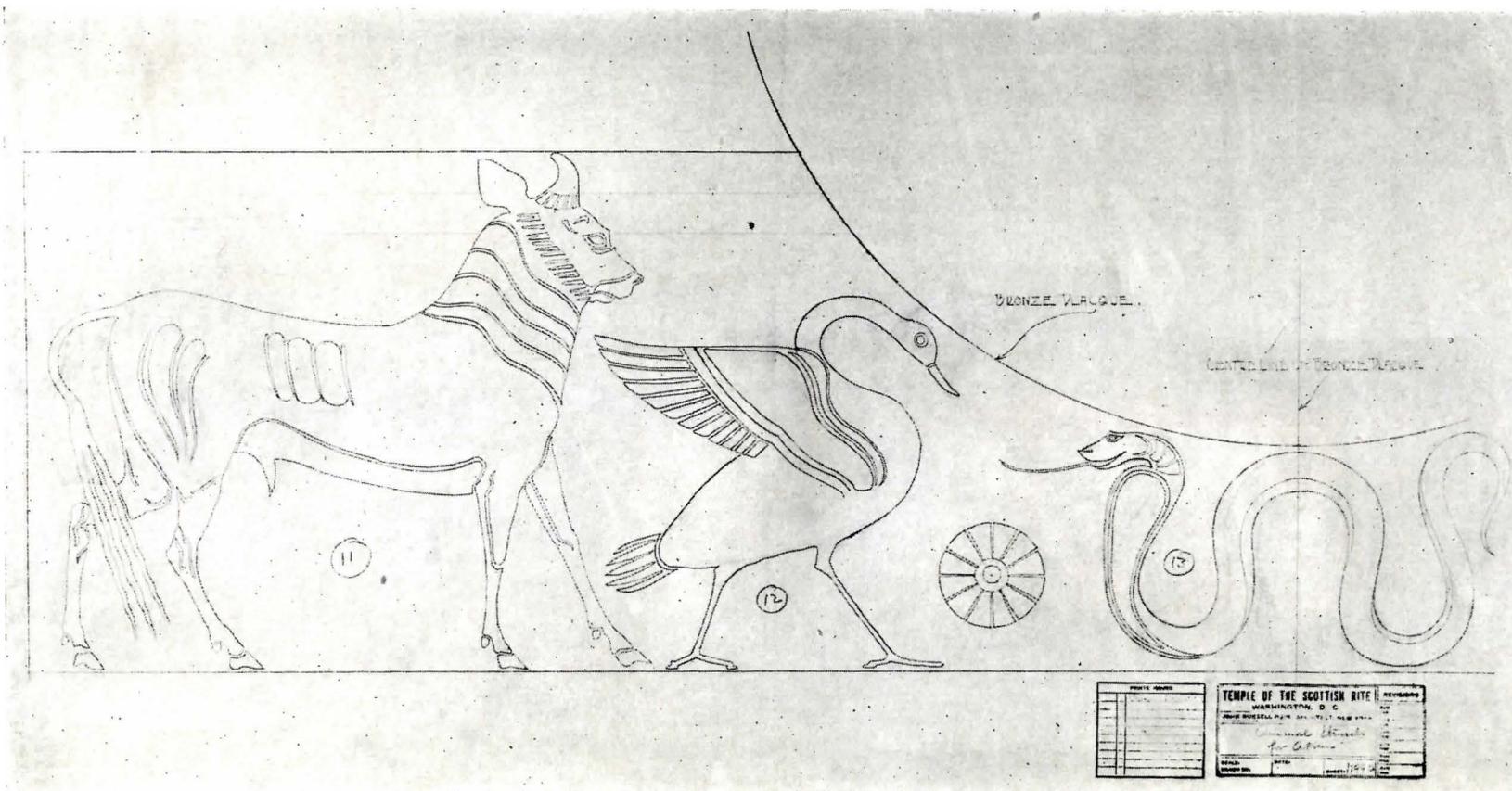
TEMPLE
DE LA
VICTOIRE APTERE

TIERS DE L'EXECUTION

DETAIL OF THE TEMPLE OF NIKE APTEROS, ATHENS

RESTORATION BY H. DAUMET WITH THE COLLABORATION OF CHAPU, SCULPTOR
FROM H. D'ESPOUY'S "FRAGMENTS D'ARCHITECTURE ANTIQUE"

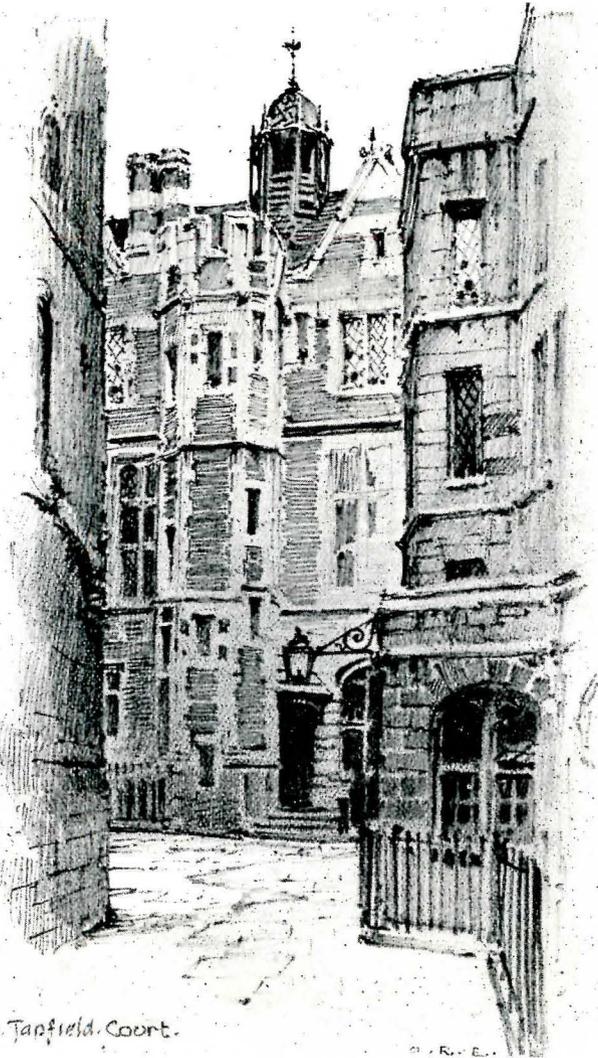
On the opposite side of this sheet is shown a restoration of detail of the Temple of Nike Apteros (Wingless Victory) at Athens. This temple was erected 435 B. C. on a small bastion at the west end of the fortifications that were built along the south side of the Acropolis by Cimon. This small but very beautiful building, after partial demolition was reconstructed of the original stones. It has four Ionic columns at each end, also two in antis at the entrance to the cella.



ANIMAL STENCILS FOR ATRIUM OF THE TEMPLE OF THE SCOTTISH RITE
WASHINGTON, D. C.

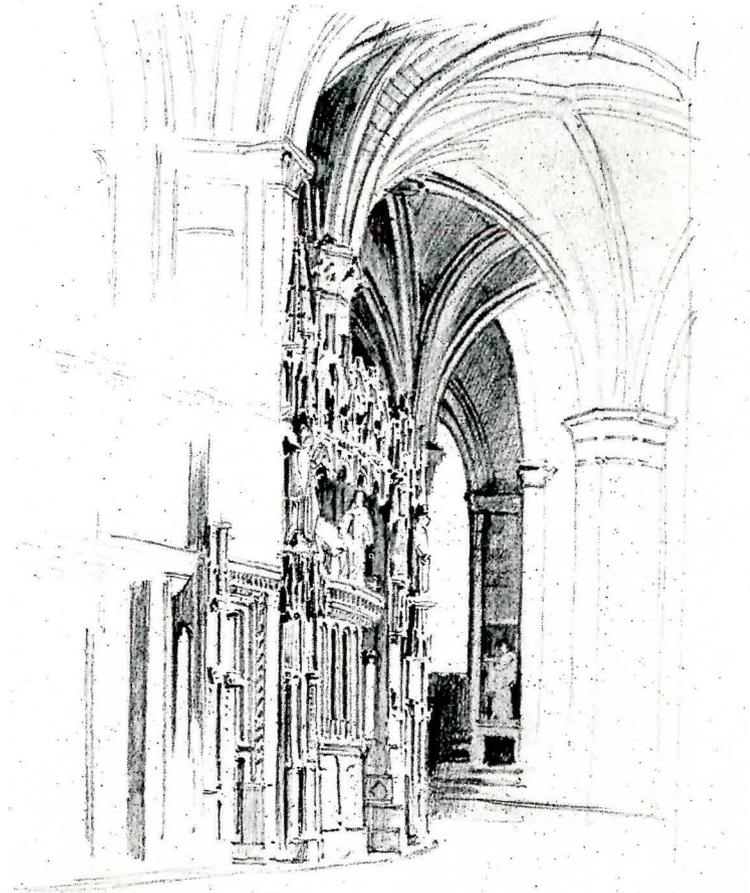
JOHN RUSSELL POPE, ARCHITECT

The design on the opposite side of this sheet forms part of a frieze of painted decoration in the atrium of The Temple of The Scottish Rite, at Washington, D. C., of which John Russell Pope was the architect. Other sections of this frieze are shown in plates in the issues of this journal for June and August.



View in Tanfield Court.
Tanfield

VIEW IN TANFIELD COURT



CHOIR SCREEN AT CHARTRES

PENCIL SKETCHES BY OTTO R. EGGERS

Reproduced at exact size directly from Mr. Eggers' sketch book

The sketches reproduced on the opposite side of this sheet are from a pocket sketch book carried by Mr. Eggers when traveling abroad as the winner of the Le Brun Scholarship of 1912. They are reproduced here at the same size as the originals and directly from the pages of the sketch book, in order that the technique may be conveyed as faithfully as possible.

The designs for furniture and decorative fittings shown over the page, like the other works of the Brothers Adam, were inspired by Robert Adam's study of the remains of Classic art during his stay in Italy, beginning in 1754. Robert Adam was born at Fife, Scotland, in 1728, was appointed architect to George III of England in 1762, and he died in 1792.

SKETCHING AND RENDERING IN PENCIL, PART II

BY ARTHUR L. GUPTILL

In this series of illustrated articles, the first of which appeared in the August issue of this journal, the technique of pencil sketching and rendering is being taken up step by step, carrying the architectural draftsman or student through a systematic course of study which has been gradually developed and put into practice by Mr. Guptill in his classes at Pratt Institute, Brooklyn, New York City. The illustrations are not merely copy plates, but each is drawn to illustrate some principle of composition or some suggestion for technique given in the text. Although these plates are primarily intended to assist the student in freehand work, they will prove helpful as well to those making pencil renderings of subjects prepared instrumentally.—ED.

Sharpening the Pencils.

THE student should determine before sharpening his pencils just what they are to be required to do, and should point them accordingly. Sharply-pointed pencils will answer very well if a drawing is to be small or if much fine detail is to be shown, but if it is to be large, broad pointed pencils will usually produce an effect equally satisfactory in a much shorter space of time. Many drawings combine both fine lines and wide lines with excellent results.

No special directions for forming a sharp point seem necessary, but a broad point is not so commonly used, so the following suggestions are offered. First of all, cut away the wood in the usual manner just as for a sharp point, but leave one-quarter or three-eighths of an inch of the full-sized lead exposed. (If this lead is left too long, however, especially in the softer pencils, it will quickly break under pressure.) Next, wear the point down on fine sandpaper holding the pencil at an angle of about 45 degrees with the paper, until the lead has the appearance shown at "A," Figure 4. The end of the lead should next be smoothed by rubbing it on rough paper until each stroke gives a firm, even tone when the pencil is held as at "B." Occasional fine lines or accents in a drawing can be made with this broad point if it is held on its sharp edge as at "C," but if many fine lines are needed a sharply-pointed pencil will prove more satisfactory. The type of broad point just mentioned is used by many artists but others go still further, and by slightly squaring the whole of the exposed lead, after it has been sharpened as described above, obtain a very crisp, clean-cut line. The illustrations for this text were for the most part made with this latter type of point.

Regardless of how the pencil is sharpened care should be taken that the point is wiped with a cloth in order to remove all dust, for otherwise it is difficult to get a clean, firm line and next to impossible to keep the paper from becoming soiled by the loose grit from the pencil. Another point for the beginner to remember is that in sharpening the pencil the letters or numbers indicating the degree of hardness or softness of the lead should never be removed.

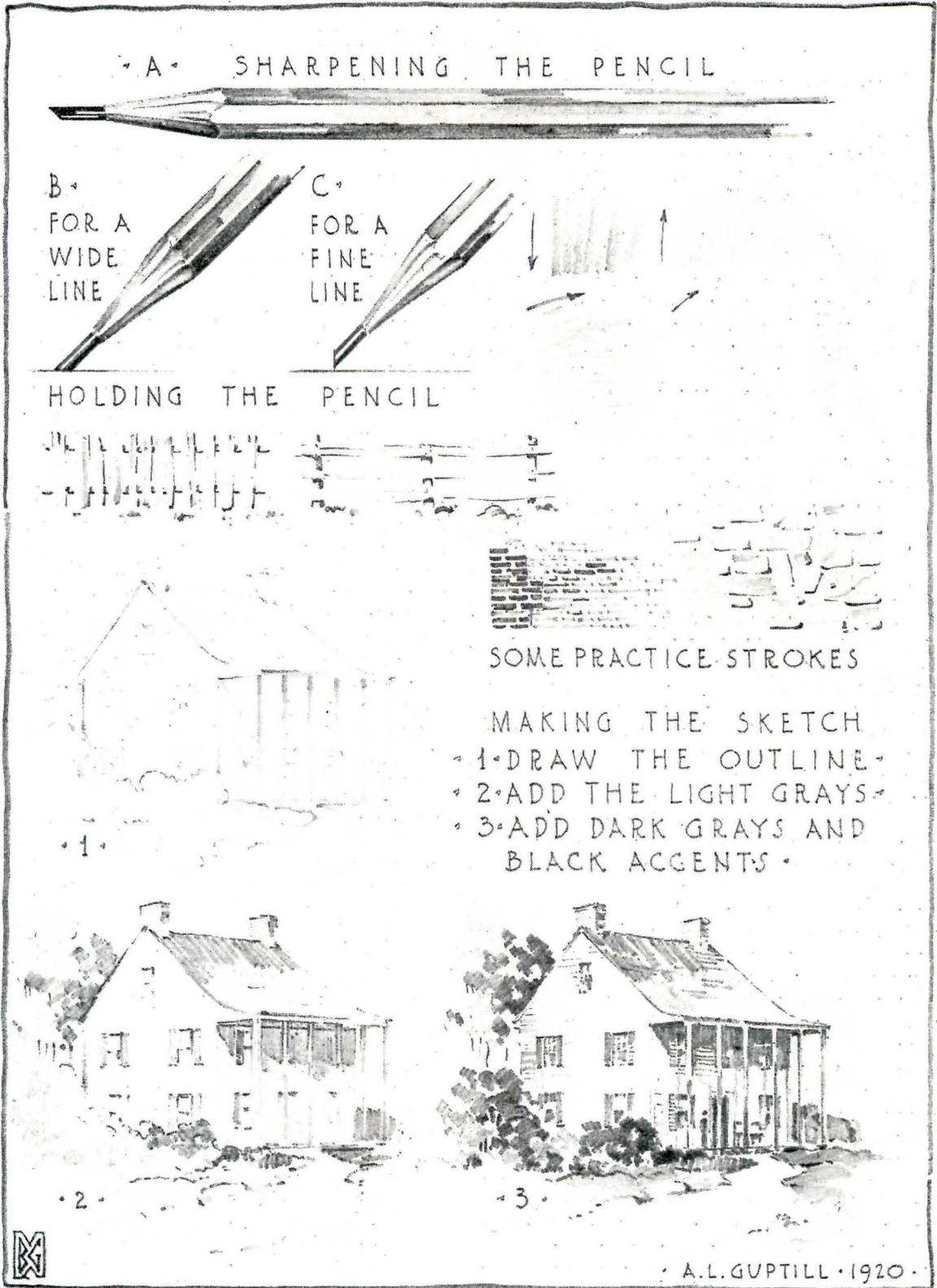
Having pointed and dusted the pencils, they are ready for use, though it will be convenient to so mark each one that its grade can be told at a

glance. There are several ways of doing this. One is by cutting or painting the letters indicating the grade of the lead on several sides of the pencil where they can be seen easily, and another is by notching the pencils, increasing the number of notches as the pencils become harder in grade. Such letters or notches are perhaps most convenient if placed about one and one-half inches from the unsharpened end of the pencil where they can be seen easily. If placed near the point they will soon be cut away and if placed at the other extremity they will be hidden if a pencil holder or lengthener is used. Some artists, instead of marking their pencils, always place them on the drawing board according to grade. By this arrangement they can tell the degree of hardness of a pencil at a glance by its position on the board and when it has been used it can be returned to its proper place and another taken up. A still different way of marking pencils for identification is by dipping them into various colors, each color representing a definite grade of lead.

The question may arise as to the number of pencils necessary for one sketch. This number will vary all the way from one, for a quick sketch, to seven or eight as used by some draftsmen for carefully finished work. Some very well-known men never use more than one grade of pencil for an entire drawing but the student can as a rule get better results by the use of three or more. The two little sketches on Plate 6 were made with a 2B, HB, F, H and 3H.

Practice Strokes.—When the pencils have been properly sharpened it is best for the student to make a number of practice strokes and tones with each one before starting to render a drawing. Try to make every stroke a thing of beauty, for it is only by combining many beautiful strokes that a pleasing final result can be obtained. Use considerable pressure, thus smoothing or "ironing out" the paper, and try strokes, too, in all directions. When you are able to make separate strokes that are firm and crisp, attempt building up even tones by massing strokes close together, either touching or with slight spaces between. Think clearly what you wish to do before you begin and then draw with directness and vigor, remembering that sharp "snappy" work is the kind best suited to architectural purposes. Figure 4 shows a few practice strokes. Copy these or make others of a similar nature. Do not erase unless absolutely necessary,

PENCIL POINTS



Sketching and Rendering in Pencil. Figure 4, illustrating method of sharpening pencil, practice strokes and steps in sketching.

PENCIL POINTS

as results are never entirely satisfactory over an erased surface. If mistakes are made use a soft eraser with extreme care and be sure to dust the paper thoroughly afterwards with a soft brush or cloth. Always keep an extra piece of paper under your hand as you work to protect the surface of the sheet.

Starting the Drawing.—After the student feels confidence in drawing simple strokes and tones he is ready to start a real rendering. Remember that simple subjects are the best to draw and choose so far as possible such objects as will increase your knowledge of architecture. Once the subject is selected it may be drawn in outline in either of two ways; the outline may be roughly blocked in with sketchy lines, which are to be erased when the final rendering is started, or it may be more carefully drawn directly with final lines, keeping them as a rule very light by using a hard pencil, and leaving them to become a part of the finished work. When the outline has been completed there are several methods of procedure before the student; he can put in the darkest tones of the whole drawing, later adding enough gray tones to complete the picture, or he can add the gray tones first, as has been done in making the little sketch at the bottom of Figure 4, later adding the dark tones and sharp accents to finish the drawing.

Many artists complete their work as they proceed, starting at the center of interest and working out, or starting at the top and working gradually down towards the bottom. This latter method has one great advantage in that the drawing can be kept clean more easily than by the other methods, but unless the student is able to think very clearly before drawing or unless he makes first a preliminary sketch for the purpose of studying the values of light and dark, it is a difficult one. As a rule it is far safer to start at the center of interest, making sure that the strongest contrasts of light and shade and the sharpest details are there, keeping the rest of the drawing properly subordinated.

Contrasts.—There are various ways of obtaining contrasts and two of the most common are illustrated by Figure 5. A white spot against a black background always shows so plainly that the eye goes to it very quickly. Likewise a black spot against white attracts immediate attention. Now, many objects in nature are similar to these spots. For instance, a white house in strong sunlight against a background of dark trees is similar to the white spot mentioned above and the eye sees it quickly because of the contrast. A dark building silhouetted against the sky illustrates the idea of the dark spot against the light background. Now, a white spot against a dark tone appears even whiter if the dark tone grades gradually to white so as to have no sharp edges to lead the eye away from the white spot, and in the same way a dark spot against a white background will appear even blacker if the white background grades out gradually to gray or black, for this will cause the white background to appear even whiter by contrast. The spots "A"

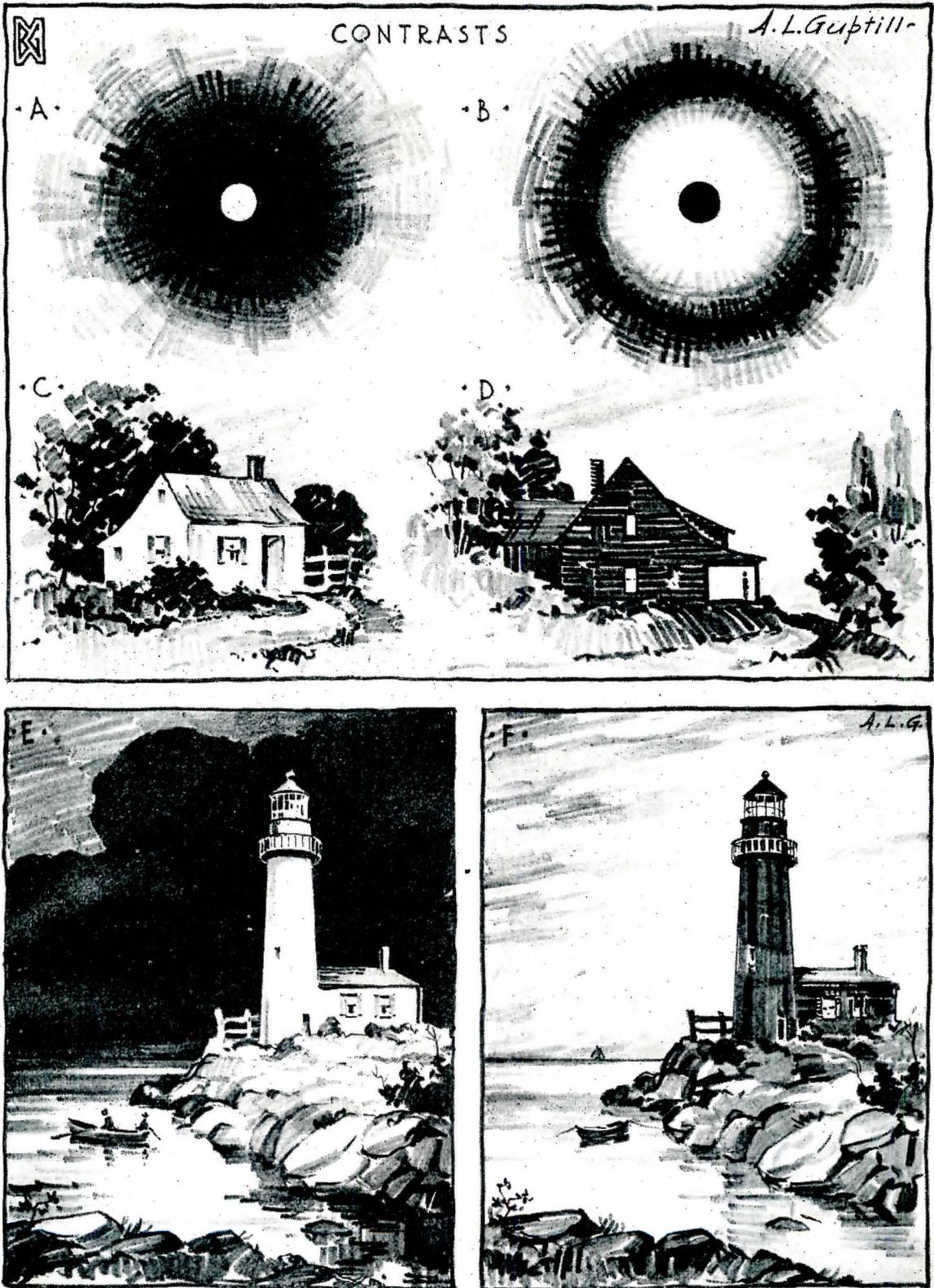
and "B" at the top of Figure 5 illustrate this point as do also the small sketches of houses "C" and "D".

It must be remembered, too, that the light conditions in nature vary constantly, so it is possible for an object to appear light against dark during certain times of the day and dark against light at others. For example an office building in bright sunlight might appear light against a deep blue sky until evening when it might change to a dark silhouette against a brilliant background. The drawings of the lighthouse, "E" and "F" at the bottom of Figure 5 still further illustrate this point. This example is rather extreme but serves to make clear that two sketches of a building made at different hours might vary greatly from each other. Therefore, when working from nature it is necessary to draw very quickly as the light is constantly changing.

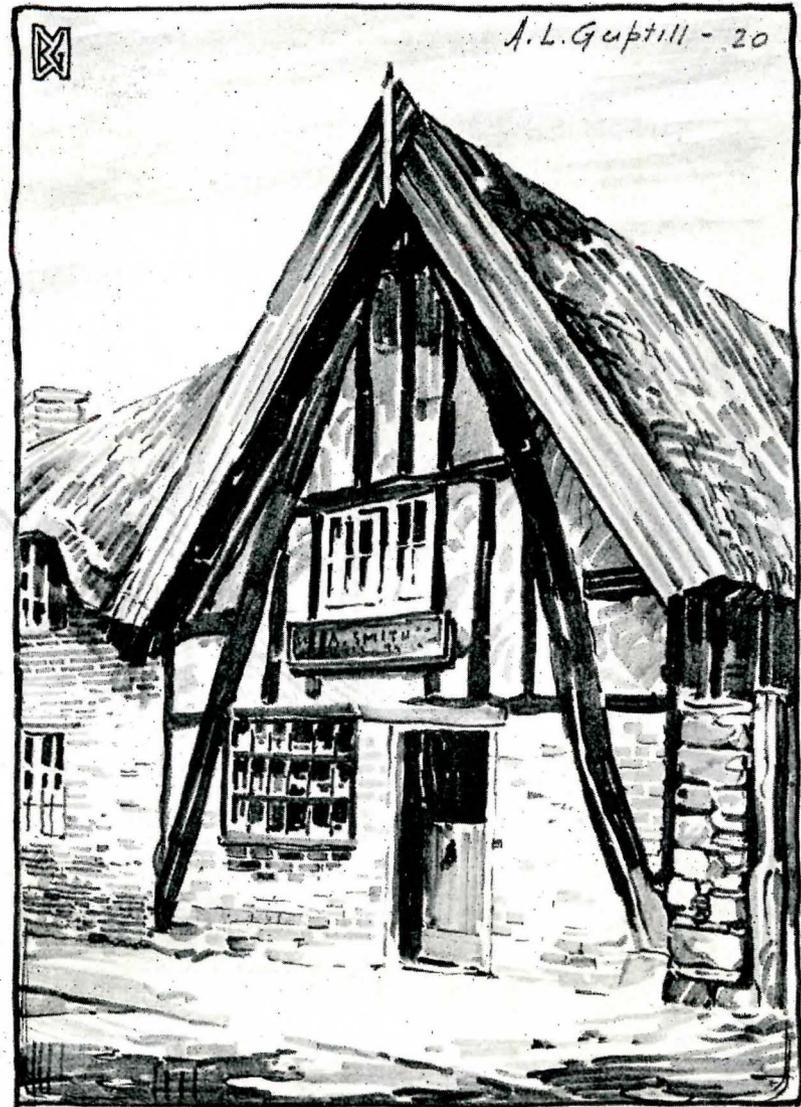
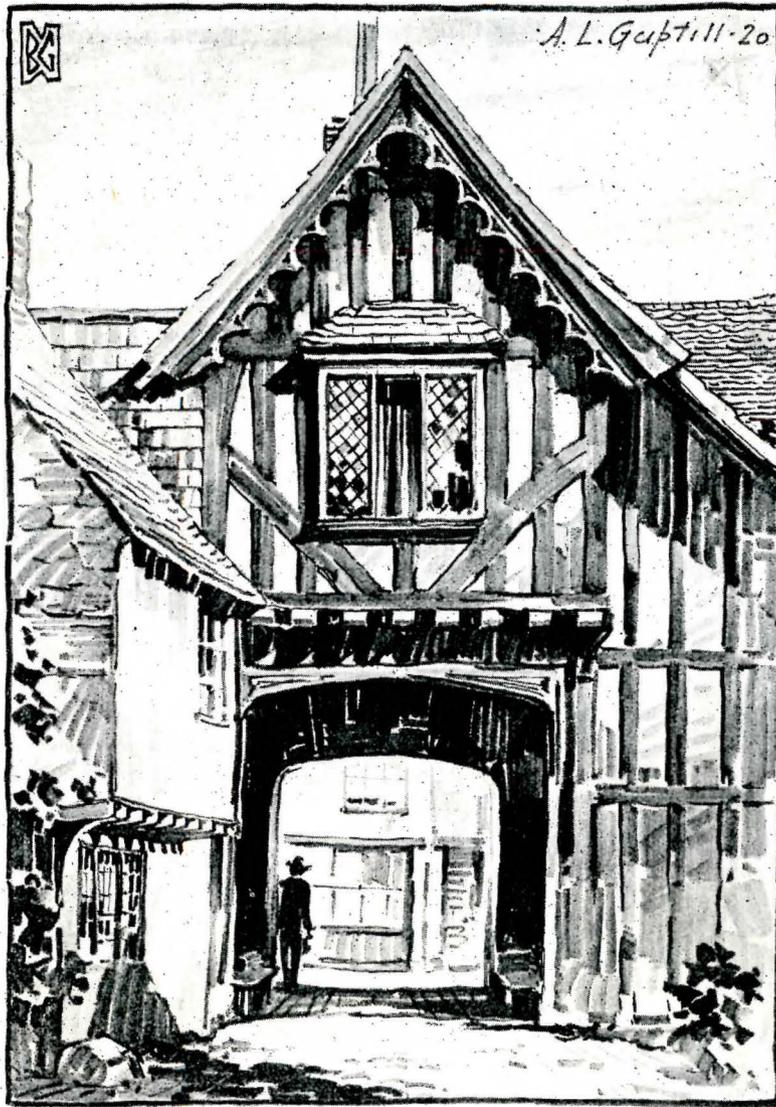
In order to prevent a sketch being broken up into too many equal areas of light and shade, thus causing confusion, it is always well to look for some one leading light area and some one leading dark area in the objects to be drawn. If a sketch is to be made of a dark stone building, that perhaps becomes the leading dark area and the light area may be found in the foreground or sky or both. On the other hand, if a building is light in tone it becomes in itself the leading light area and the background of trees or sky or the foreground masses become the dark area. Having decided on these leading light and dark areas, look for subordinate areas, such as doors, roofs or similar details and give each just its proper amount of accent to make a satisfactory composition of the whole. It is usually true that we find in the same subject many contrasts of light against dark and dark against light, but in making a sketch remember that the eye would see the strongest contrasts near the focal point, or center of interest. Look for the sharpest accents here and in the drawing subordinate all others, for unless this is done the eye will jump from one point to another, which will cause the picture to lack unity and repose. It is easy to hold the eye at the center of interest as has been shown above if strong contrasts of light against dark or dark against light are shown there. The two sketches on Figure 6 still further illustrate this principle of contrast. The center of interest in the first is around the arched entrance and here the contrasts have been kept sharp and strong. First there is the light spot of the opening to the street. Then in sharp contrast to this is the dark tone of the archway itself. This in turn is strong in its contrast with the lighter tones of adjacent walls, and these light tones on walls and street are emphasized further by the fact that they are graded to dark at the edges of the sketch. In the second sketch, showing one of the earliest forms of timber construction, there are similar contrasts to hold the eye to the center of interest. First the dark doorway becomes the focal point. This is strong in its contrast with the surrounding light walls of the building and with the street, while these light

(Continued on page 28)

PENCIL POINTS



Sketching and Rendering in Pencil. Figure 5, illustrating contrasts of light and dark.



PENCIL POINTS

Sketching and Rendering in Pencil. Figure 6, illustrating the principle of contrasts. In the sketch at the left the contrasts around the entrance, the center of interest, have been kept sharp and strong. In the sketch at the right the dark doorway is the focal point, contrasted with light walls, which are in turn surrounded by large dark areas graded outward.

PENCIL POINTS

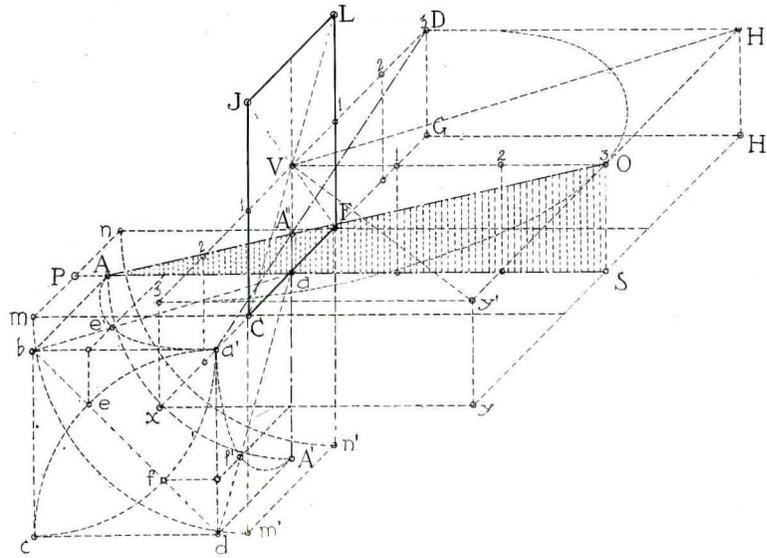


Figure 13

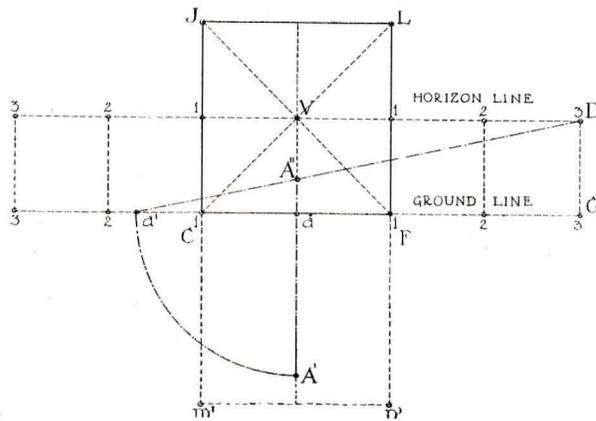


Figure 14

PERSPECTIVE DRAWING, PART IV

BY PAUL VALENTI

BY the process of rotation we shall now demonstrate that we can repeat in the one plane at our disposal, i.e., the plane of our picture, the operation indicated in Figure VII (June issue), where we operated in three planes, finding the perspective of point A .

As in Figure VII, selecting arbitrarily a point A in the geometric plane, on line PS for example; we wish to find where this point will be "pictured" on the transparent plane. This will be found as before by first raising a perpendicular from point A to the ground line CF to point a , thence a straight line from a to V or vision point. Consequently at the intersection of this line aV and a straight line drawn from the object A to the observation point O (which is called the ray or line of vision), we find A'' which is the picture or perspective of A on the transparent plane. Thus as before we find we have a triangle OAS corresponding to the triangle OXY in Figure VII. To reduce these three points, which are in three separate planes, to the plane of our picture, we will first center in a on the ground line (which is the foot of a perpendicular from A to the ground line) and rotate point A from its original position in the geometric plane to its *new* position in a' on the ground line.

In similar manner, (following the identical operation as in Figure 9), by centering in point V , we will rotate point O in the opposite direction, from its original position over the station point outside of the picture plane, to its new position in point D on the horizon line, which as in the case of a' is on the same plane as the picture plane. Thus we will also find that the triangle OAS and $Da'G$ are exactly the same. It will be observed that line $a'D$ intersects line aV in exactly the same place as does line AO —which is at point A'' or the perspective of point A . It is most important to see this very clearly.

To construct Figure 13, repeat the operation of Figure 12, omitting the half circle in the ground plane. Select arbitrarily a point A on line PS in the geometric plane and establish the perspective of point A as was done in Figure VII. Thus we obtain the triangle OAS with A'' at the intersection of lines aV and AO (See Figure VII). At point a' , which is obtained by conducting a line from point D through point A'' to the ground line, (which corresponds to line OA), construct a perfect square $a'bcd$ ($a'b=aA$). Draw diagonal bd . Centering in point d describe a quarter circle ca' . From the intersection of this arc ca' and the diagonal bd raise a perpendicular to the line $a'b$, thence a line at forty-five degrees to line Aa . At the intersection of this line and the diagonal ab we will find e' . Note the following relations: $a'bcd$ = a geometric square; $a'bAa$ = a square in parallel

perspective; $a'bcd' = a'bAa$, also the diagonal $bd = ba$. The arc $a'c = a'A$, therefore by starting at point A and passing through point e' to point a' we have drawn a quarter of a circle in parallel perspective corresponding to the quarter circle ca' in the geometric square.

Now we will proceed to rotate the geometric plane containing point A , on the axis CF (as in Figure 10), by centering in point C with the radius Cm , describe a quarter of a circle mm' and also centering in point F with radius Fn describe a quarter circle nn' , bringing the geometric plane $CFmn$ from its original horizontal position to its *new vertical* position $CFm'n'$, which again is on the same plane containing the picture plane. Also by centering in point a on the ground line CF , with a radius aA , and rotating this point A from its original position in the horizontal geometric plane to its *new position* in point A' in the vertical geometric plane we shall have A' also on the same plane as the picture plane. In the same way, also in the case of point D which is point O rotated to D on the horizon line, we have again all our points in the one plane at our disposal, i.e., the plane containing our picture.

Therefore to find the perspective of point A' (which is point A rotated from its original position in the horizontal geometric plane to its *new* position in the vertical geometric plane) as before, and in all cases, first raise a perpendicular from point A' to the ground line CF to point a , thence a line from point a to the vision point V . Centering in point a with radius aA' rotating in the *opposite direction* from point D , describe in parallel perspective a quarter circle to point a' on the ground line. Unite points a' and D and at the intersection of lines aV and $a'D$ we will find A'' or the perspective of point A' , which in turn is point A taken from its original position in the horizontal geometric plane and brought to its *new* position in the vertical geometric plane.

To construct the arc or quarter-circle $a'A'$ in parallel perspective, proceed as before, using the geometric square already drawn $a'bcd$. Construct on line $a'd$ the square $a'daA'$ in parallel perspective corresponding to the geometric square $a'bcd$. Conduct also the diagonal ad . Centering this time in point b with radius ba' describe a quarter circle $a'c$. At intersection f raise a perpendicular to line $a'd$, thence a line at forty-five degrees to line aA' . At the intersection f' we will have a point corresponding to point f . Starting at point a' and passing through point f' to A' we will obtain a quarter circle $a'f'A'$ in parallel perspective, which corresponds exactly with the quarter circle $a'fc$ in the geometric square. This shows us how, in

(Continued on page 25)

THE CHIEF DRAFTSMAN

HIS TRAINING AND QUALIFICATIONS

BY CHARLES C. MAY

EVERY architectural draftsman must question himself at some time or other along lines like these: "When can I hope to become chief draftsman?" or "What should I do to fit myself for the job of chief draftsman?" or "Why have I no desire to be chief draftsman?" or again, "Why have I not reached the position of chief draftsman years and years ago?" In the majority of cases, the position next ahead—the target nearest at hand to shoot at—is the job of chief draftsman. Only for the few is the drafting room a momentary stopping place—entered into before the opening of an independent office merely for the sake of "going through the mill." On the other hand, it may be assumed that everyone rejects instinctively the idea of a permanent, stationary lodging before the drafting board.

Virtually every office larger than the smallest contains a job whose occupant has the title "chief draftsman" or its equivalent; but the job itself varies among the offices through a wide range—one might almost say that in responsibility and breadth it varies inversely to the size of the office. In the large organizations the chief draftsman is necessarily only a single wheel in a machine of a good deal of complexity, and the very volume of work passing through his hands limits his personal responsibility for the details of it.

In the small concerns the chief draftsman is virtually runner-up to the architect—his personal deputy ready to lay hold of any job, or any department of a job, as conditions may dictate. He will not only have charge in the drafting room of a wide range of architectural problems, but in the direction of each individual job, he may very probably be called upon to help out in the design, to make preliminary studies, to write specifications, to oversee the general drawings as they are produced, to check them when they are completed. After that, he may handle part of the supervision at the site, besides handling the dealings with contractors and clients in the office. To combine abilities for filling acceptably all these functions would require, one would say, all the architectural virtues, and it is true that in practice it works out satisfactorily only where the work is of the simpler order and the office of the least complex organization.

We have left behind by several centuries the time when a man might aspire to make himself an authority in each of several major branches of professional work. True, we still can point to a few architects of the first rank who at the same time have attained fame as etchers or painters or poets, but one branch sooner or later crowds the other to the sidelines, and a choice must be made. So with the chief draftsman in his relation to office

work, many an office has learned to its sorrow, if not to its financial disaster, that architecture requires in its practice more specialized knowledge in more distinct branches than any other line of work; that if a man tries to cover the whole field he is spreading himself far too thinly; that some department must needs be slighted—in other words, that if he wants his work along any given line to be more than superficial, he must specialize.

In the past, the chief draftsman has been a combination of designer, speeder-up, critic, diplomat, disciplinarian and executive. His position has required him to bridge the gap (often too wide) between the architect and his drafting room; to speak the language of both and to interpret the one to the other. He has been obliged to grasp the spirit and essence of the unintelligible pencil "squiggle" of his chief and to translate it into an intelligent scale drawing with the spirit retained. He has been held responsible for producing unity between plans and specifications—two elements which in many offices have never been completely reconciled to each other's company. His time has been eternally frittered away through no fault of his own, but because of being ceaselessly pecked at by questions of the merest detail. He has too often been expected to produce a set of finished working drawings at a given moment when blocked at each step by decisions from above being withheld or reversed. He has been expected to examine minutely every set of general drawings as well as every scale and full size detail issued from the office, to see to it that the blueprint, when it goes out, is a true working drawing containing all the essentials, as few as possible of the unessentials, and no "foolishness." Yet this constant interruption and jumping from one subject to another, which has been the lot of every chief draftsman, has made it physically impossible for him to lock himself up with a set of drawings and to concentrate upon them until he has completed not only a superficial check, but a deeper probe to make certain that beneath the surface, sound construction and knowledge of detail will make the building fit together as planned.

To the difficulties which arise from making the chief draftsman cover too much ground, add another which is partly due to the first condition. The chief draftsman has too often in the past been a graduate draftsman, but nothing more, that is, his training, his bias, his experience, have all sprung from the drafting room, whereas a goodly portion of his experience ought to have been gained outside on the job. The real function of the chief draftsman, after all, is to hand out to the contractor a set of drawings which talk in the same terms

(Continued on page 26)

PENCIL POINTS

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RESULTS IN COMPETITION FOR FELLOWSHIP IN LANDSCAPE ARCHITECTURE OF THE AMERICAN ACADEMY IN ROME.

THE competition recently held for the Fellowship in Landscape Architecture in the American Academy in Rome resulted in the award of the fellowship to Ralph E. Griswold of Wyoming, N. Y., and honorable mention with cash prizes to Stanley White and Fabian McK. Smith. Mr. Griswold and Mr. Smith are Cornell men, while Mr. White received part of his training at Cornell and part at Harvard. The judges of the competition were: Mr. Frederick Law Olmsted, Mr. James L. Greenleaf, Mr. Charles M. Lowrie, Mr. Albert D. Taylor, Mr. Ferruccio Vitale.

The winner of the fellowship receives a stipend of \$1,000 a year for a period of three years, lives at the Academy while in Rome, where he receives board at cost, and in addition funds to defray traveling expenses are provided. During the first two years the work consists in study in Rome under the guidance of the staff of the Academy and in travel in Italy. During the third year traveling in France and England is an important feature of the work. Undoubtedly the greatest benefit is derived from the association and collaboration with the architects, sculptors, landscape architects and painters working at the Academy.

This fellowship is given every three years, but it is hoped that it may be given annually. The lack of funds, it is understood, is the only thing that prevents the Academy from giving the benefit of this training to one man each year instead of once in three years, as at present. It seems that the means should be forthcoming for so important an educational work.

AT the National Arts Club, 119 East 19th Street, New York, an exhibition of sketches and small pieces of sculpture by members of the club is being held.



RALPH E. GRISWOLD

Winner of the Fellowship in Landscape Architecture at The American Academy in Rome.

PERSPECTIVE DRAWING, PART IV.

(Continued from page 23)

parallel perspective, we can rotate point A' to point a' on the ground line.

Now passing to Figure 14, we have a direct elevation of our operation with all points contained in the one plane at our disposal, or the plane containing our picture. For example: First we have the transparent plane $CFJL$, corresponding exactly with the transparent plane in parallel perspective $CFJL$ in isometric drawing Figure 13. $D=1\frac{1}{2}$ times height or width of picture or transparent plane. $CFm'n'$ is the geometric plane rotated on axis CF from its original horizontal position to its new vertical position.

Finally we have arrived at the possibility of finding the perspective of point A' using the same rules as before, but this time with all points in the one plane which is the only plane at our disposal, i.e., that plane containing our drawing.

We may now, therefore, find the perspective of point A' using the same rules as before, but this time with all points in the one plane.

Proceeding accordingly (Figure 14) to find the perspective of point A' , recalling our former operation, we will first raise a perpendicular from point A' (the object to be pictured on the transparent plane) to the ground line CF to point a . Then we will conduct a straight line from this point a to the vision point V . Centering in point a with radius aA' rotate point A' (in the opposite direction to point D) up to the ground line to a' . Uniting a' and D we will intersect line aV at point A'' , which as was found in all preceding cases is the perspective of A' .

AUGUST 12, 1920.

GENTLEMEN:

Replying to your letter of August 9th asking us to give you a few items of interest regarding the Technology Club, would say that the item of most interest to us at the present time is the fact that recently there was turned over to the Club the income of a trust fund known as the John E. Sweet Artisans School Fund (John E. Sweet having been past President of the American Society of Mechanical Engineers)—this income to be used by the Club in its lecture course. The amount of this income will enable the Club to obtain the best lecturers available on current mechanical and engineering subjects, etc.

Thanking you for your interest and inquiry, we remain,

Yours very truly,

TECHNOLOGY CLUB OF SYRACUSE,
K. V. Farmer, Secretary.

NEW YORK CITY, AUG. 15, 1920.

EDITOR PENCIL POINTS:

Apropos of your request in the August number of PENCIL POINTS for suggestions of future subject matter, I wish to suggest "Standardization of Working Drawings." I do not wish to convey that we shall strive to establish sizes, "set-up" arrangement, etc., but that we should endeavor to obtain uniformity of material indication, symbols, abbreviations, "short cuts," etc. Lettering, general title arrangements, the architect's "card" and such things form the personal element of a drawing, just as a letter-head has its personal element, in its engraving or its printed arrangement, and so should be left to each office—we can't eliminate that. But we can eliminate, by degrees, the confusion and disagreement on such things as are necessary to inform the contractors, workmen and art-

PENCIL POINTS

ists of our ideas and intentions for the completed work.

If, through PENCIL POINTS, you were to make a call to draftsmen and architects all over the country for plates or tabulations of the symbols, abbreviations, and indications for materials, you would find a varied opinion exists in different localities as to "how it should be done." This would probably be the quickest way of securing the "dope" especially if a small remuneration were offered for accepted plates or tabulations. From this collection an approved and revised series might then be placed before "The Architectural Association of America" for adoption or further presentation to the A. I. A. I believe PENCIL POINTS will be the official printed "mouthpiece" of the draftsmen's organizations, and that through it such things can be most quickly accomplished.

Another suggestion I have whereby the draftsmen can be of help to each other is to have a "Stunts" column, to which they will contribute descriptions and explanations of pet tricks and methods that save time and get results in their work.

With best wishes for "PENCIL POINTS," I am

Truly yours,

(Signed) FRED R. LORENZ.

Note.—The suggestions contained in the letter printed above are so good that we are going to act on them. Readers of PENCIL POINTS are invited to send in plates or tabulations of symbols, abbreviations and indications for materials. An honorarium will be paid those whose plates or tables are published. Brief descriptions of "stunts" are also wanted and those published will be paid for.—Ed.

THE CHIEF DRAFTSMAN

(Continued from page 24)

the contractor himself uses, plans which will make the roof tight when the building is completed, and will give the mechanical equipment a chance to function as it ought.

Unfortunately, the day has not yet passed when the millman or the terra-cotta man, or the stone-cutter can curl the scornful lip at many of the details which come out of the offices of architects of high standing. In modern practice the number of tricks in method and construction which the drafting room can learn from the job is nothing short of infinite. This means that in a building of any special importance every drawing should be examined with the greatest care by a man who can look through the contractor's eyes, who understands the construction of a plant such as the drawings represent, and who can guarantee with reasonable certainty, when he is ready to issue the plan, that the building as designed, will work. Such a man must be eminently practical, he must know construction; but that does not by any means imply that he must have the type of mind which scorns everything on earth which is æsthetic. Though not himself a designer, he should appreciate the designer's effort, and he should be able and willing to work with all earnestness to produce a combination of good design with sound construction.

These two fundamentals of modern architectural practice—the necessity for specializing, and the necessity for having all drawings passed upon by an expert in construction and mechanics—have begun to show their influence in office organization. It is becoming less common to find the all-round type of chief draftsman, who either wears himself out in a conscientious attempt to cover the ground, or contents himself with the old routine of passing from board to board, assuring himself that progress is being made, trusting to the superficial check which he is able to make that the drawings will get by when they are turned loose. More frequently, too, we find the department of design made quite separate under a chief of its own, and the business office taken over by a third departmental head. Besides this, in offices where large projects are handled, more reliance is being placed upon the "job captains"—the best equipped men in the drafting room—who are responsible to the chief draftsman for the production of the drawings on their own

jobs, and who can take much of the burden of routine from his shoulders. The chief draftsman under these conditions might be called the "production manager," since the bulk of his work culminates at the point when the drawings are printed. His responsibility is not lessened by these changes—it may be not so broad, but it is deeper and more definite.

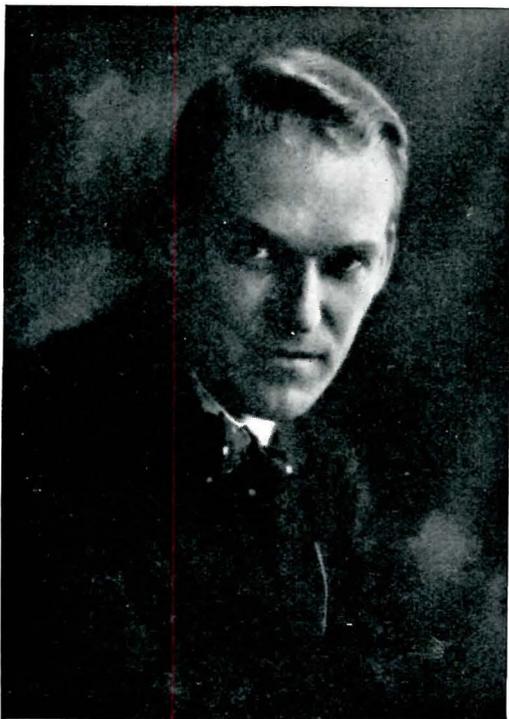
One may properly ask, why in this process of specialization, does not the designer take over the function of the chief draftsman and let the constructional and engineering work be handled as a separate department. The answer lies in the nature of the job itself. The production manager is essentially an executive, while the designer's function is first of all creative. The trend and habit of mind of the designer does not as a rule show the qualities which go to make up the competent chief draftsman. And one must say frankly that this position is by no means an easy one to fill adequately. The man who combines all the qualities necessary for eminently successful work as chief draftsman is a rarer bird than is a first-class designer, a fine superintendent, or a competent specification writer.

Take these qualifications and list them as they suggest themselves. I should place first as an essential a sense of personal responsibility, and the willingness and ability to work under it. Unless a man can look upon the work before him to a great degree as if it were his own, putting into it the energy and spirit which that implies, he had far better avoid the position of chief draftsman. Even under the revised and specialized conditions we have been speaking of, the best of these production managers will never be found quibbling or sidestepping to evade the burden of an added responsibility.

Next, perhaps, in importance, comes the capacity for handling matters of infinite detail without being smothered under the mass, nor losing the mental buoyancy he must have for the more general aspects of his job. And more than the actual handling of detail, he should be able quickly to analyze a problem; to grasp, on looking over a drawing, the essentials, even when they are obscured from the average draftsman by a mass of lines and figures and notes. Incidentally, too, the chief draftsman is recognizing more and more that the working drawing is primarily a diagram to give information to the builder, and that clarity, simplicity, and accuracy must be insisted upon as far more important than beautiful draftsmanship, repetition and a bunch of conversational notes. The best working drawings of today are less impressive to the eye than formerly, but they tell the contractor what he wants to know.

Most obvious of all requirements for the chief draftsman is accuracy. One would say that this need be no more than mentioned, yet it is amazing to find that high grade offices are today allowing working drawings and details to be issued for building, with no check other than that of the draftsman himself. Such practice cannot be excused ever on the ground that the man who makes the drawing is exceptional. The best drawing by the best draftsman needs the examination of a fresh eye, working outside the mental groove of its author. So here is probably the spot where the chief draftsman is of the greatest value to his firm—in catching the inevitable slips before they get outside the office. If he cannot do this with a reasonably high average of certainty, all the other qualities are rendered pretty nearly null and void.

Further qualifications, mostly matters of personality and human relations, have already been hinted at. For example, diplomacy finds every-day exercise in the drafting room. The chief draftsman who can get along with his men while holding up the standard of production is the one every architect is looking for. Morale in the drafting room is a very tangible asset, particularly in these days. An attitude of sullen discontent or indifference is too readily engendered. The good chief draftsman is the one who has the temperament to rebound from blows, and, while recognizing the obstacles, to find his way around, over or through them.



OTTO R. EGGERS

The fact that Mr. Eggers is primarily an architectural designer is, perhaps, responsible to an even larger degree for his success in making the renderings for which he is so widely known than is his mastery of technique or his keen and sure sense of pictorial composition. As the first holder of the Le Brun Scholarship he travelled abroad in 1912. He gives special credit for inspiration to Mr. Hornbostle, in whose atelier he studied.

PRESENTATION DRAWINGS, PART II.

(Continued from page 8)

drawings to encourage and further such refinement, and for mutual benefit between architects, draftsmen and students.

Rendered drawings to illustrate studies being made, after the preliminary design has been accepted, are often necessary when changes are called for. A good legal course—which should never be neglected whenever the word “change” enters into consideration—is to render an accurate working, or preliminary, scale drawing in color. (See Figure 17.) It should show, if possible, the original and altered design of the part of the work to be considered. The drawing should be made with strong, firm lines to withstand strong washes. The coloring should be faithful, and free from any reproach of “cleverness.” It must be borne in mind by the draftsman that such drawings are, like the specifications and contract, legal documents; and may become legal “exhibits.”

PERSONALS

HENRY W. ROWE, architect, has removed his offices to 120 East 40th Street, New York City.

SAMUEL P. HALL and HAROLD M. BUSH have formed a partnership under the firm name of Hall & Bush, for the general practice of architecture and engineering, and have established connections with HENRY B. HUBBARD, Professor of Landscape Architecture, Harvard, for the treatment of housing problems, real estate developments and landscape architecture. They have opened offices at 16 South Third Street, Columbus, Ohio.

THOMAS M. JAMES, architect, has announced that his office, established 1898, is now incorporated under the name of Thomas M. James Company. The offices of the organization are at 3 Park Street, Boston, Mass., The American Trust Building, Cleveland, Ohio, The Fuller Building, Springfield, Ohio. The members of the organization are: Thomas M. James, President; I. Bertram Marston, Treasurer; William H. Jones, Vice President; Russell C. Spring, Construction Engineer; Lewis W. Foster, Boston Manager; Fred A. Wright, Cleveland Architect; Wallace E. Dibble, Springfield Architect.

E. S. J. PHILLIP, JR., formerly of the office of Cass Gilbert, is now with Murphy & Dana in China in connection with the extensive work this firm is carrying on in that country.

Classified Advertisements

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QUERIES

In this department PENCIL POINTS will endeavor to answer questions of general interest pertaining to Architecture and allied arts, giving the best available information from authoritative sources. We desire that you feel free at all times to make use of this service, inviting your co-operation in making the department both interesting and valuable. Should you desire an answer by mail, enclose stamp for reply. Address queries to, PENCIL POINTS, (Attention of E. M. Urband), Metropolitan Tower, New York City.

Question.—We are desirous of securing data on some of the best normal school work in the country. Have you ever published any special numbers dealing with this subject, or have you ever published anything in book form? I. H. H., Tacoma, Wash. *Answer.*—THE ARCHITECTURAL REVIEW has in the past published the following numbers containing illustrations and description of schools: Sept., Oct., 1912; Jan., Feb., 1913; Nov., Dec., 1915; June, Aug., 1917; April, 1918; Jan., 1920. No material on schools, however, has been published in book form by this firm. The Education Bureau of the United States, Government Printing Office, Washington, D. C., has printed a bulletin on Normal Schools in 1912; p. 1089-1127. Information on school house planning and construction can be obtained from the National Education Association of the United States, Department of School Administration, Committee of Standardization of School House Planning and Construction. Good book references on schools are: "Some Essentials in the Planning of School Buildings for Community Use," National Education Ass'n of the U. S., by W. C. Bruce (p. 366-369); "School Architecture," by W. C. Bruce, published by Johnson Service Co. (1910); "The Planning and Construction of High School Buildings," by H. A. Hollister, University of Illinois, Urbana, Ill.; "Standardization of School Buildings," by W. B. Ittner, in the National Education Ass'n of the U. S., p. 375-379.

Question.—Please tell me where I can get some plans for kitchens, serving rooms, bakeries, etc., for hotels and large institutions. Are there any magazines or books that will help me in my study of kitchen efficiency? I am not especially interested in home kitchens, but am working on those of hospitals, colleges, and cafeterias. Miss M. V. F., Raleigh, N. C. *Answer.*—Special numbers of THE ARCHITECTURAL REVIEW: The special Hotel Number, April, 1913, and the special Hospital Number, Oct., 1918, contain plans and articles on kitchens, serving rooms and bakeries. Other good references are: "The Planning of Hospitals," *Inland Architect*, articles by T. M. Clark; "Modern Hospitals," *American Architect*, 1912; a series of authoritative articles by E. E. Stevens, E. P. Casey, C. W. Williams; "Planning and Equipping the Kitchen," Iowa State College of Agriculture; "Handbook of the Association Cafeteria Y. W. C. A."

Question.—Where may I buy or secure "Smoley's Parallel Tables of Logarithms"? McGraw Publishing Co. were the publishers at one time. G. P. N., Decorah, Ia. *Answer.*—G. K. Smoley's Tables of Logarithms can be obtained at Baker and Taylor Co., Booksellers, 354 Fourth Ave., New York. Price \$4.50.

Question.—I would thank you to send me a list of architectural books, particularly those on "Superintendence," "Construction," "Specifications," "The Orders," Vignola (American and French), and "History of Architecture." F. J. T., Bethlehem, Pa. *Answer.*—Representative books on these subjects are: "Architects' and Builders' Pocket Book," F. E. Kidder, Wiley & Sons; "Architects' Directory and Specification Index," published by The Wm. T. Comstock Co.; Pierre Esquie's "Vignola," (now out of print); "The Italian Orders

of Architecture," by Charles Gourley, Logans, Green & Co., publishers; "History of Architecture," by B. and B. F. Fletcher, B. T. Batsford, publishers. Architectural book lists can be obtained directly by writing to the Architectural Book Publishing Co., 31 East 12th Street, New York; Brentano's, Fifth Ave., New York; The Wm. T. Comstock Co., 23 Warren St., New York; Wm. Helburn, Inc., 418 Madison Ave., New York; J. Wiley & Sons, 432 Fourth Ave., New York.

SKETCHING AND RENDERING IN PENCIL

(Continued from page 19)

tones are in turn surrounded by the large dark area of roof tones, verge board shadows and the like, which are graded outward to the edges of the sketch.

In starting a pencil drawing the student is urged to make a preliminary study of the values of light and dark as soon as the outline has been completed. This study can be made to good advantage on tracing paper directly over the outline drawing, and when completed will serve as a guide for the actual rendering. Once the values have been determined in this way, the student is free to give his attention to the technique. At this point it might be well to offer a few suggestions. First of all we must work for variety of line, for it is impossible to express all materials and surfaces with one type of line. Smooth, straight strokes suggest smooth surfaces, while irregular strokes are best for representing rough, uneven surfaces. As a rule it is well for the strokes to follow the structural lines of the objects to be represented. This means that the strokes used on vertical walls will usually be vertical or perspectively horizontal. The roof lines will follow the slope of the roof or vanish towards a point with the other parallel lines. Curved surfaces can as a rule be best represented by the use of curved lines.

It is suggested that the student try a few practice sketches to further fix in his mind some of the ideas suggested in this text. Do not be discouraged if the first results are not entirely satisfactory; it is only by making mistakes and learning from them that one can learn to draw.

AN innovation at the T-Square Club, Philadelphia, is the luncheon talk idea. Mr. Charles Z. Klauder recently gave a luncheon talk at the club. Mr. Klauder's subject was "Some Elements of Yacht Designing." A beautifully designed and executed scale model by Mr. Klauder was on exhibition.

A NEWLY organized club is The Draftsman's Social Club, which has its headquarters at the Council House, 74 St. Mark's Place, New York City. The purposes of the club are, briefly: mutual help along professional lines, to assist draftsmen to positions, to promote good fellowship and to give opportunities for recreation and self-improvement. The Secretary of the Club is Mr. Louis Kellner.

ARCHITECTURAL ACOUSTICS

CHAPTER II

IN the August number of PENCIL POINTS we outlined the two divisions into which the subject of architectural acoustics is divided, namely, the problems involved in preventing the transmission of sound from one room to another through intervening partitions, and the problems arising from the interior conditions of any given room as affecting comfortable hearing within that room. Too much emphasis cannot be laid on the wide difference between these two classes of phenomena. One is concerned wholly with materials and construction affecting the *conduction* of sound, while the other deals almost entirely with the *reflection* of sound. Materials adapted to one class of correction are not suitable for the other. Also in the first case construction details play an essential role, while design is a more important factor in the second.

Transmission problems have not as yet been reduced to the same scientific basis as auditorium acoustics. Most of the available knowledge on the subject is based on the results of practical experience and not on scientific research. Certain outstanding facts are, however, immediately apparent.

Sound may be communicated either by conduction of vibrations through the fabric of a building, as in the case of machinery in direct contact with some structural member, or it may first be communicated to the air and thence pass into and through surrounding walls and floors.

Concrete is an excellent conductor of sound, partly due to the homogeneous nature of the concrete and partly to telephoning along the reinforcing rods. With such construction, sound is easily conveyed to all parts of a building. Brick forms a much better construction, especially if the walls are thick and there is a great difference in density between the bricks and the mortar. Such interruptions in density interpose an effective barrier to the progression of sound waves through the material. Vibrating machinery should as far as possible be placed in the base-

ment on solid foundations separate from those of the building. The base of every machine should be insulated from its foundation by felt or cork several inches in thickness. If machines are located on an upper floor it is exceedingly difficult to prevent vibrations from being communicated to the floor which then acts much like the sounding-board of a piano.

Where the problem is one of the conduction of sound from the air in one chamber to that in another, the best form of partition, other than a brick wall, is one built up of alternate layers of reflecting and absorbing materials. A good example is a double wall of plastered tile or metal lath separated by an air space containing a layer of heavy felt. Great care must be taken in the construction of such a partition that the two component walls are not in contact at any point and that no nail or pipe is allowed to penetrate the several layers and act as a conductor. The double wall causes multiple internal reflection of the sound and absorption by the layer of felt interposed in the path of these reflections.

For floor construction there are two alternatives. A double floor may be used, the upper one being floated on felt laid on the lower one, or a suspended ceiling may be placed in the room below and felt laid over the metal furring of this ceiling, thus insulating it from the floor above.

In all cases of prevention of sound transmission, the utmost care must be taken in the smallest details of construction, as a seemingly insignificant oversight will often entirely vitiate the effectiveness of the treatment.

In the October number, we shall begin the discussion of problems of auditorium acoustics, to which a more rigorous analysis can be applied.

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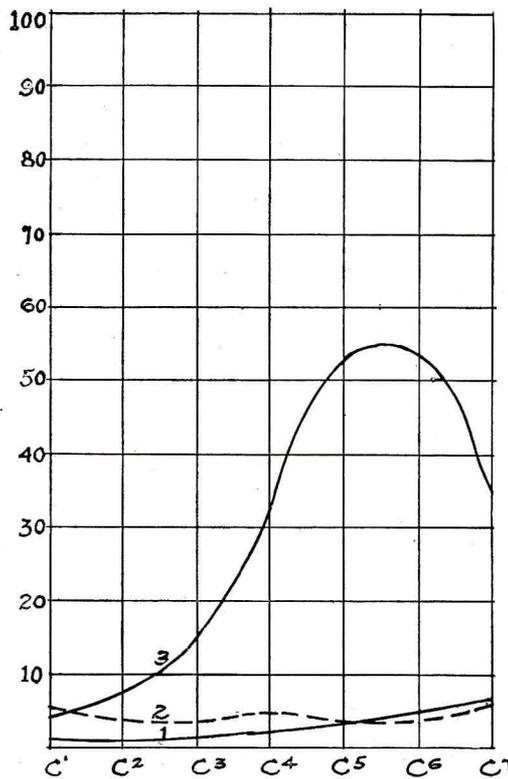


FIGURE 1

The above graph shows the variation of absorbing power for reflected sound with the musical pitch. Curve 1 shows the absorption of unpainted brick surfaces. Curve 2 shows the absorption of soft plaster on wood lath. Curve 3 shows the absorption of Akoustolith sound-absorbing stone. The figures at the left show the percentage of absorption, while the letters at the bottom indicate octave intervals of pitch, C³ being "middle C." Most of the audible energy of the voice, as well as other sounds, lies in overtones above C⁴. It will be noted that in this region the absorbing power of Akoustolith is from seven to sixteen* times greater than the most favorable of other types of construction. The advantage over glazed tile, concrete or hard plaster on metal lath is even greater.

*In the August number this was stated, by a self-evident error, to be only five times as great.

THE SPECIFICATION DESK

It is the purpose of this department to cover all matters having to do with specifications. The Specification Desk is to be an open forum to which manufacturers as well as architects, draftsmen and specification writers are invited to contribute. Nothing of an advertising nature will be permitted but it seems to the publishers wholly desirable that those who prepare specifications and those desirous of having their goods specified shall meet on common ground in this department of PENCIL POINTS. It is not the idea that the merits of materials shall be discussed in these pages but rather those broad questions which come up in connection with every building operation for which the specifications prepared in the architect's office form the basis not only for the builder's estimates, but also for the determination of the materials and equipment to be used.

The readers of PENCIL POINTS are invited to submit material for this department, either in the form of questions or suggestions calculated to improve any phase of specification work.

THE SPECIFICATION WRITER AND THE MANUFACTURERS' LITERATURE, PART II

BY LOUIS R. HOLSKE

TO provide a basis for the systematic discussion of the question, "In what form would the specification writers in architects' offices prefer to have on file data from manufacturers regarding materials and equipment?" an attempt will be made in succeeding issues of this journal to indicate the information specification writers need regarding each class of building material and equipment.

In the August issue, the general requirements that apply to all catalogue information for the use of the specification writer were outlined. Such matters as the form of the catalogues or other literature most suitable for filing, the character of the data, etc., were gone into.

Now, the various classes of building materials and equipment will be taken up one after another in succeeding issues. So far as possible, this will be done in the order in which the materials appear in the building during the process of construction, the classification being made on this basis to embrace all types of buildings.

The object in view is to make as clear a statement as possible of what the architect and the specification writer need, what information the manufacturer can give that will be of assistance. It is quite possible that in doing this we may overlook some articles or classes of materials which should be mentioned and it is hoped that much valuable matter will be added to that which will be brought out in these pages in relation to the data needed on each class of materials. In fact, it is the writer's main purpose to bring out the thoughts and the experiences of others, to bring the architects, specification writers and manufacturers together in a discussion of this question as it relates to each class of materials or equipment in order that a fund of information and ideas may be contributed, from which helpful conclusions may be drawn.

In the first group to be discussed will be mason work and foundations, brick work, water-proofing and fire-proofing, structural steel and miscellaneous metal work and building stones.

The next group considered will take in hollow steel, including trim, furniture, medicine closets, etc., hollow metal windows and the hardware suitable for use with hollow metal work. Associated with the latter group

NOTE.—Mr. Holske, who is in charge of the preparation of specifications in the organization of McKim, Mead & White, will lead the discussion of this subject in the coming months.—Ed.

will be the metal covered work. Roofing, including all materials in general use, will next be taken up for discussion. Inside work, marbles, tiling, mill work, rough and finished, carpentry and painting will be included in another great class. Heating and plumbing will be taken up in a separate class.

While the writer will endeavor to cover these various classes with as much thoroughness as possible, he will depend upon the responses from others to supply the most helpful matter needed to make the discussion of the question of real value.

Some manufacturers have already done much toward putting the data relating to their products into convenient form for the use of the specification writer and have made a serious effort to supply the kind of data needed. The results of these efforts afford suggestions which should not be overlooked in any discussion having for its purpose the improvement of the manufacturers' literature in general from the standpoint of the specification writer. With these exceptions the need for improvement is great. If the needs of the specification writer can be made clear the manufacturer will benefit as well as everyone else.

PUBLICATIONS OF INTEREST TO SPECIFICATION WRITERS.

Details for Standard Hardware. A collection of twenty-seven full-page plates drawn by Mr Frank Snyder in bound form, showing the correct application of door and window hardware. Copies may be secured by applying to The Lockwood Mfg. Co., 16 Reade St., New York, N. Y.

A New Folder has been prepared by The Stanley Works, New Britain, Conn., describing in detail set No. 1783, garage hardware. In applying for this refer to folder B-12.

Architectural Terra Cotta, Brochure Series, Vol. IV., The Bank. Halftone reproductions of both large and small bank buildings showing application of architectural terra cotta in various finishes. 10½x14 inches. 36 pages. *Vol. V., The Garage.* Uniform with the rest of the series showing garages of many types in architectural terra cotta, either entire or in combination with brick. Copies of these brochures may be had on application to the National Terra Cotta Society, One Madison Avenue, New York.