

required. It is the same with the beautiful canopies of stone, supported sometimes by solid masonry, pierced only by a narrow light, at others by the slightest of shafts, sometimes forming a head to a window, at others without any apparent object, that stand at the bases or many spires. Their work is to counterbalance by their weight the outward thrust of the sloping sides of the spire.

As another example, take the clustered shafts supporting the nave arches of a XIII century cathedral. How slight and delicate they are, especially when compared with the heavy Norman columns, or the massive Italian piers, or early French abutments. The slender, lofty shaft, rising almost uninterruptedly from the base near the ground to the spring of the stone vaulted ceiling, bearing its portion of the load above, obtaining its lateral support from the wall against which it stands and to which it is here and there attached—those marvellous pendants from the fan-vaulting of the XV century, of which a well known example is in the roof of Henry VII's chapel at Westminster, constructed with such extraordinary ingenuity—are not mere ornamental "drops," but perform a very serious and important duty, forming actual abutments to the downward curved surfaces of the fan-vaulting from which they actually hang. Such construction is a marvel now, even though we have the detail of every stone employed; much more was it a mystery in years when the knowledge of the art had first died out, which it soon did, under the influence of the Reformation. These hanging masses of stone looked very threatening over the heads of the devout worshippers, no doubt, but they have hung for over 350 years, and except an earthquake rend the vault, they cannot fall. Sir Christopher Wren, the great apostle of the imitative styles, when asked about them, shook his head, as at a problem far too deep for him to solve, and replied to his querist: "If you will tell me how they are constructed, I will go and do likewise." The key to the answer must be found in their use and object. Sir Christopher Wren could not comprehend this, and therefore he was not ashamed to say he knew nothing about them. Understanding what duty they perform, it is not a difficult matter to get at their construction. And thus it is, with every feature, and it behoves us as the exponents to the rest of the world of the art of Architecture, to look into these matters, and if we profess to be architects, to act accordingly.

Students and draughtsmen must beware of the easily acquired, but none the less barbarous habit, of introducing details and features they do not comprehend. If a man wishes to be ever anything but a mere copyist, he must apply himself to this study. It will repay him well, and give him a great interest in his work, such as he perhaps never dreamt of before, and his ultimate designs will be free from the insipid, childish details, stuck on without rhyme or reason, that are to be met with side by side with the works of men who know what they are doing. Some men call themselves architects, that is, expounders and practicers of the art of Architecture, when they do not know the A B C of the art.

UNFAIR PRACTICE.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—I want to call your attention to a piece of very unfair practice on the part of some men practising as architects. "Architects," so called, appear to forget that it is their duty to stand between the proprietor and the contractor and see that the one is fairly dealt with by the other. I find it is the custom of some men not well up in estimating their designs, to ask builders to tender as if the work had been definitely ordered by the client. The builder spends valuable time and trouble on preparing a tender, believing the work to be going on if tenders are satisfactory, not knowing that the chances are that nothing further will be done, that is to say, that the client has not yet made up his mind that he will proceed with the work because he has not had an estimate of the cost. An architect has no right to treat contractors so. He should be able to prepare himself a good estimate of the cost, and then, if the amount meets with the client's approval, to obtain tenders on the understanding that the works are to proceed if the tenders are satisfactory. My attention was called to this method of procedure by a client of mine informing me he had found it the custom with some "architects" he had employed, and told me he would not trust any architect's estimate unless based on actual tenders. He expected me to prepare working drawings, details, rough and specifications, get contractors to tender and let him know the result, all on the chance of its coming within a figure he had in his mind. He said he had had a great deal to do with building, and this was the invariable way he had proceeded. I remonstrated with him in vain, and told him flatly no architect would do such a thing. The result was, he took the whole matter out

of my hands, and, I dare say, went back to his "architects" so called. My blessing went with him. Those kind of men are not the clients for architects proper.

Yours truly,
"AN ARCHITECT."

MASONRY AND STONE CUTTING.

By JOHN A. PEARSON.

A VERY interesting and instructive address on the above subject was given before the members of the Toronto Architectural Draughtsmen's Association, Nov. 20th, by Mr. John A. Pearson, recently from England, now of this city. The subject was introduced with a few useful hints to be observed in the preparation of foundations to receive footings, and the best methods of laying drain pipes, the points to be observed and avoided, the composition of mortars and cements, and the best manner of testing their respective qualities.

FOUNDATION WALLS.—In laying footing courses, the broadest bed should be placed down. When a large quantity is required, there is sometimes a difficulty experienced in obtaining them all of an equal thickness. They generally run off from the six inches specified, to three or four inches, and if the architect is not watchful, the wane side is placed against the bank and packed up level with a spall, and the full six inches thick exposed to view. In foundation walls, there is always a tendency to make the inner face strongest, for the reason that it is the line face, and always exposed. The mason sets up his inner face first, thus securing the first place on the wall, and naturally selects the best stone to make a presentable face (especially if it is to be pointed for lime whitening). The bank side is next walled with the stones that have been picked over, and, in some cases, knocked off to suit the tailers of the inner face. Less care and time is thus expended on the bank side. Wallers are never constantly in the employ of one builder; as soon as the foundations are in they are stopped, and must seek employment elsewhere. Being so migratory, they are not over scrupulous, and it cannot be expected they would place the good stone against bank, and the wane footing exposed, to be condemned by the architect, who is always satisfied with a strong looking job.

The reveals to door and window openings are generally allowed to be built in brick to save labor cutting, the brick tied into the rubble, and the lintel thrown across, which has a bearing never more than nine inches—the whole thus forming a kind of loose case. This is not desirable if it is to be built in brick; the rubble should run through every four or five courses to tie the work, not the brick, for 6½ inches is as long a tie as can be obtained in brick work. The rubble which forms the body of the wall should form the tie.

After minutely describing the different kinds of wall stones and walling, particularly sneek walling (so often aimed at but seldom attained), which depended chiefly upon the setting up of the lades, and the arrangement of the stones in the wall, the speaker went on to say:—Wallers should always work opposite to each other. Never allow one man to build a wall alone. Walling is different to brick work, it being possible to raise only one face to the height of the "lade" (which should never be more than 15 inches) at a time, the stones must necessarily become narrower on the bed, whereas, if two were employed, they could overlap or tie on to each other's work, in the height of the line. A foolish mistake with some architects is to insist upon the stone being squared back full five or six inches on the joint. Three or four inches is ample, the stone then tapering off, enabling the opposite stone to indent with it and the fillers being placed diagonally or straight across. All wall stones should be placed on their natural bed; if reversed they will drink the water more freely. Guard against walling in "bleeders," the presence of the iron in them is generally detected by a blue, yellow or purple tint in different kinds of stone. Turning the stone so that the bed forms the face, should be condemned.

In ogee or circular walls, after the first two courses have been set to the trammel or template, pegs are driven in 2 ft. 6 in. or 3 ft. apart, to project sufficiently to clear the rock for plumbing, and from these points the "lades" are set up and walled in between. Where sills occur, they should be set on "throughs" and ties thrown immediately across door and window heads. All walls should be weather pointed, not jointed, for in jointing, on either side of the impress of the tool is left a narrow band of mortar untouched by the steel, left raw and porous, which absorbs the water freely.

TESTING THE WORK.—If there is any doubt as to the fillers being properly bedded, pull out here and there in the wall, and hold a lighted candle in the aperture. If dry, the flame will be disturbed by the current of air which will play inside the wall. Take a flexible cane, and walk over the work; if the stones rise under

the feet, you may be sure they are not properly bedded, and by forcing the cane down into the wall in different places, you can gain a fair idea as to the number of throughs.

STONE CUTTING.—After describing the numerous tools and uses of same employed in stone cutting, a description was given of rock, punched, rowed, inch-tooled, scutched, bush hammered, boasted, tooled, and cleansed faces, and the method by which a mason would bring a stone to a plane surface—the sinking, squaring back, and trammelling required in running moulded work in arch stones, and how arch stones were often worked slack to the square on the joints. The different throats, water joints, dowelling, joggles for coping, projecting string courses, cornices and arch stones were fully explained; also what "banker marks" were, which, in very old buildings, were cut on the face of the stone, and by the comparison of which the date of different buildings could be arrived at. The speaker pointed out the way to detect the bed of a stone, and the presence of "drys," explained the way in which stones were "lewis'd" to be raised, and the setting of ashlar and moulded work, and concluded by exposing a few of the frauds that are practised in the trade in worked stone, where to look for such, and the best way to detect them.

A STUDENT'S REPLY TO "ABACUS."

EDITOR CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—After reading "Notes of a Trip to the West" in the last number of the CANADIAN ARCHITECT AND BUILDER, I was much disappointed, as I could see in them no information of a practical kind, nor anything but a wholesale condemnation, on the one hand, of architecture as seen in Chicago and the States, and on the other, about as general a compliment for Toronto architecture, all in such sweeping terms as to make one doubt if any part of the article referred to is entitled to any consideration whatever.

As a student, I feel the need of help to make proper comparisons and to form correct opinions as to the merits of different works, but it certainly will not tend to my improvement if I am satisfied to stop with the conclusion that this or that is good because I like it, and that another is bad because it is not satisfactory to me, without attempting to go into some analysis to establish a reason for my opinion.

I have many times wished that in such articles as the one mentioned, by "Abacus," we might find more definiteness. If a piece of architecture is condemned, the reason might be shown in detail, even introducing some sketching, if necessary, in order to show what would remedy the fault found and make the work good instead of bad.

I am willing to agree with "Abacus" that there are many vulgar, inartistic and ridiculous examples of architectural failures in Chicago, and also that there are many buildings in Toronto worthy of admiration, study and pride, but in all fairness, is not the reverse of this equally true?

Some parts of "Abacus" notes strike me as being somewhat inconsistent, and other parts so extravagant in language as to be ridiculous. He says of the house by Richardson, on Prairie Avenue: "It is the most artistic house which we have yet had the pleasure of seeing—it is dignified, quiet, unobtrusive, yet refined and homelike. Unless the plan of this house was known to the beholder, he would be inclined to look upon it as retiring and gloomy in the extreme." So in the case of "this most artistic house," whether a beholder would regard it as "refined and homelike," or "retiring and gloomy in the extreme," would depend on whether or not he "knew the plan." On this ground, perhaps, if "Abacus" had "known the plans" of all the other houses, some might have found more favor in his judgment.

I should like to notice some of the public buildings both in Chicago and Toronto which are mentioned by "Abacus," but do not wish to trespass too much on your valuable space. If, with all the architects in Chicago, and the immense amount of expenditure under their direction, the sum total of their productions is, as stated by "Abacus," "a few, indeed, of artistic houses," one wholesale store building "artistically worth more than all its other buildings," and churches, "the best of which have so much that is bad about them, that one cannot speak even a single word in praise," where, oh, where, is the encouragement to study, with a hope of producing anything artistic enough to earn the good opinion of such critics as "Abacus."

Would it not be more valuable to both architects and students to have an analysis or criticism of one or a few examples, with reasons for conclusions drawn, and suggestions of remedies for defects?

Give us something more definite.

STUDENT.