

## THE AGE OF BRICK.

DURING the early Christian period, and away down through the middle ages, the majority of public and ecclesiastic buildings were mostly constructed of stone, which in the mild climates of Greece and Italy have not wholly disintegrated, particularly when the stone work has been backed up with bricks. Many of the finest structures of early Christian architecture, that were built of stone, have disappeared altogether, while many of those formed of brick and stone together have come down to us almost in their entirety, while not a single one of the great buildings composed of bricks altogether is known to have disappeared.

In fact, the most perfect buildings that have come down to us from the earliest days, are built of bricks, and we have evidence in a thousand and one instances of the superior lasting properties of bricks over all other known building materials. The Pantheon, the building of which dates back more than a century beyond our era, is built of bricks backed up with concrete, and despite the bandit and barbarian, and the tooth of time, it still remains almost entire, as an object lesson in the use of bricks. The great Gothic Church of San Stefano, Venice, though badly designed and worse constructed, shows the bricks of which it is built to be as sound and shapely as when first laid, though held together by a very inferior mortar.

The Triumphal Arch erected at Rimini in honor of Augustus, is partly constructed of bricks, and partly of marble; but while the marble is nearly rotten and dropping to pieces, the despised bricks remain perfect, and hold together the whole structure and its decaying aristocratic veneering.

By far the oldest Pyramid is of brick, the one of Sakkara, said to have been erected more than a thousand years before Jacob wandered into Egypt. It still holds together and gives promise of being a thing of mystery for a few thousands of years more. Indeed, we believe the Pyramid of Sakkara is supposed to be the oldest structure known. The Temple of Thebes, and the great Pyramids of Ghira, are modern by comparison.

For many reasons brick seems to be the best and most natural of building materials. It is easily handled, materials for its manufacture are abundant and readily obtained, no extra skill for the manufacture of the plainer sort is necessary, it can be moulded to any shape, it is better than stone inasmuch as it is a better non-conductor of heat or cold, it is drier, weathers better, will resist the action of frost and fire better, is lighter, and when well made will resist nearly as much strain as our best building stones. It can be carved if necessary, with a definiteness almost equal to most of our stones, and its economy places it within the reach of medium-sized purses.

Recent improvements in the manufacture of pressed bricks give the modern architect and builder a decided advantage over their predecessors in many ways. In olden times the architect was obliged to have all his moulded and ornamental bricks made by inexperienced workmen, under his own supervision. In the construction of a large building of brick, the brick-maker was one of the architect's staff, and made his bricks to the order of his superior. His appliances for making and burning were of the crudest sort, and, as we know from examination of old bricks, they were often badly made and badly burned. To-day the architect may choose his bricks from catalogues, making his own choice of shape, quality and color, and can rely on getting what he orders; and he can order to suit his design, whereas the old builders were obliged in almost every case to make their designs to suit the materials available.

Canada—Ontario at all events—is well equipped so far as modern bricks are concerned, and speaking from a knowledge born of long experience under several flags, the province named produces a brick that has no superior, and few equals on this continent. Specimens of bricks now before me, made on the Don, near Toronto, from Credit Valley, from the yards at Milton and Beamsville, are fully up to all required standards, and while they vary somewhat among themselves, both as to quality and color, any one of them is superior to the bricks of our granddaddies.

That the coming cities and towns of this great Dominion will be made of brick, goes without saying; even the streets hereafter will be of brick, and it is within the range of possibility that some method will ere long be discovered or invented by which strong slabs of brick or terra-cotta will be made that can be ser-

viceable for sidewalks. This is an "age of brick," and the possibilities of the fertile art are beyond the comprehension of ordinary mortals.

One thing before closing. Some steps should be taken by brick-makers to have one uniform size throughout the whole Dominion. I find, in comparing different makes, quite a difference in sizes: in length, width and thickness. One-eighth of an inch difference counts up in a large building, and frequently confuses an estimator, particularly if he figures closely. Again, the bricklayer finds it difficult to work in pressed bricks with common ones, as the latter are nearly always larger than the former. A standard size would be a boon to all builders, and should be of importance enough to warrant legislation, if the brick-makers themselves do not agree upon a uniform size.

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Collingwood, July 3rd, 1895.

## THE PROPER SHAPE OF CHIMNEYS AND FLUES.

THIS question has been considered by a man of a wide and successful experience, and answered very positively as follows:

"Having an idea that it was not all uphill work in a chimney, I concluded to investigate the operation of the one in my house, to see if there were any down currents in it, as I heard frequently asserted. I took light tissue paper and made some small light balls of it. I was particular not to crush them tight and make them heavy, and also was careful to keep them round. With these I went to the top, and balls that were dropped into the center of the chimney were invariably blown out. Those dropped into the corners in a majority of cases went to the bottom, where I found them on taking out the pipe to look for them. Those that did not go down, I think, struck some projection, and were thrown into the central up current and were blown out. This settled in my mind that rectangular flues were wrong, and while the area of a round flue of the same diameter might be less, it was equal in air carrying capacity, as it had only one up pressure, with no corners for friction and tendency toward a vacuum. This led me to making the ends of my partition hot-air flues round, and, while they are easier to make and cheaper, they are equally as effective as if they had square corners, satisfying me that all flues should be round."

From another experienced source comes this idea: "I believe that the house with round flues can be heated satisfactorily for the six months necessary with at least a ton of coal less, where the house with square flues would not be as comfortably warmed."

## COLORING ARCHITECTURAL TERRA-COTTA.

THERE is no device resorted to by the clay-worker that is alike so inartistic and so ineffectual, says the British Clay-Worker, as attempting to give to architectural terra-cotta blocks a finer color than they naturally possess. The coating of such blocks with pigments or washes, or the staining of their surfaces, is never of a lasting nature; it soon wears off under the combined action of rain, smoke, frost, and other influences of an atmospheric nature.

"Then what are we to do if our clay will not yield a good color?" some may say. Well, the only course open is to determine whether it is admissible to use chemicals in the composition of the blocks, so that increased tone of color shall be due not to a superficial film, but to the mass itself. Obviously, this will be governed entirely by (1) the cost of the chemicals, (2) the facility with which they can be applied; and these conditions, again, will be governed by the price which can be got for the goods.

If the selling price warrants the expenditure of labor and chemicals, by all means color the mass throughout; but if, on the other hand, the extra labor and expense would not be recouped, it is clear that the best course to adopt is to abandon the manufacture of the blocks, for which the particular clay is obviously unsuited, and exploit the clay for other purposes.

Washes and stains, however, are never permanent, and permanence is the first quality that is demanded in architectural facings. If these principles were more often present in the minds of clay-workers, we should not see so many ghastly failures in our streets, failures which only tend to bring our industry into disrepute.