

A CHAPTER FROM MY NOTE BOOK.—BUILDING
METHODS IN ROME. *

By M. B. AYLSWORTH.

This audience being composed of architects, the object of these cursory notes shall not be to treat of architectural styles, their origin, development or peculiarities, that subject having become threadbare. Familiarity may not necessarily have bred contempt in the minds of all, or any, but too much devotion to such study may have wrought some evil, which might here be hinted at.

Ancient architects designed the grandest and most beautiful of buildings, fitted in all parts for their intended purpose, using the best materials to be obtained and suited to the climate and other local conditions, without thinking of, or publishing the name or style of order. Classification has been the work of later students, many of whom have noted the peculiar or pleasing forms, while missing altogether the spirit of the designer.

Through superficial study of such classification the laity have become familiar with the names thus applied, and this little knowledge has endangered and retarded the development of true architecture from the Renaissance until now. The modern architect, expecting to be asked to name the style of his design, and not having the boldness to say he disregarded ancient styles, must adopt one of them, and probably disfigure the building by the incongruous or needless use of certain features, or their imitation in perishable material.

Without this supposed necessity, out of our modern requirements, resources and limitations might be evolved suitable, durable and pleasing buildings of a style that in succeeding ages might also be dignified by an appropriate name. As it is, how may this age expect to be known or described, when in turn it shall be referred to as ancient? Will there be any remains of it whatever 2,000 years hence?

Building methods, though always affecting the development of true style, have not always been so fully described as the finished form, and some of these methods, observed during a visit to the "Eternal City," will now be referred to.

During the early ages, known as the time of the kings, the building materials seem to have been wood and the volcanic rock of the neighborhood, called Tufa. Of the former nothing has survived, though Egyptian wood much older is plentiful. Of stone structures without mortar, there are portions of the walls of Romulus, the Mamertime prison, cloaca maxima, and other remains.

In later periods, probably through expeditions from the east, the properties of clay and cements became known. There are now, and have been for ages, extensive brick yards in the suburbs of the city, mostly the property of His Holiness the Pope. There is also in the vicinity a reddish clay called Pozzolani, which, mixed with common lime mortar, makes it hydraulic and very strong. The great strength of this mortar, after use in brickwork, further led to the use of concrete, out of which grew the peculiar Roman methods of walling and vaulting still in use. This was their own, and only invention, but was one of very great importance.

The Romans became a conquering nation, and amongst the spoils of war great numbers of beautiful columns and sculptures in the rich marbles, porphyry, alabaster, &c., were brought to Rome, with architects, sculptors and artisans as slaves to set them up. Through the use of these, applied to their rude buildings, arose the Roman style of applying architectural forms having no relation whatever to the construction of the building. From the interior use of these columns came the basilica, and finally the cathedral. The earliest dome covers the lower dungeon of the Mamertime prison. This is not a true arched vault, but is formed by the rapidly oversailing stone courses of the sides, until they meet to form the floor above. In this dungeon St. Peter caused water to spring out of the solid rock, so he might baptize his jailor. The spring is still flowing, whether St. Peter was ever in Rome or not. The cloaca maxima is probably of later construction, and is a circular tunnel of true arched stonework. All later vaulting is either of brick rims on edge and keyed, or brick simply bedded flat in cement, or they are formed entirely of concrete, in which gravel, broken stone or brick and even lumps of clay are used. Over church naves and similar structures, the form is semi-circular, but over ordinary rooms is elliptical, often very flat and thin, wasting no height. The haunches are always levelled up at the same time, and when all has set with the walls, it is like a solid stone. That grandest of domes the Pantheon, is merely the largest example of what was, and still is, in one form or other, the common ceiling of all ordinary rooms. It is a solid mass of concrete, tapering from a great thickness at the springing, to a comparatively thin shell at the top, and contrary to the general rule as domes are built, is flatter outside than inside. The walls of the building therefore, 20 ft. thick and also of concrete, have to sustain no outward thrust, though the span is 143 feet. These walls appear as if of well laid brickwork, an unusual sight in Rome, but this is merely for the most part a facing of brick, laid or built up along with and to retain the concrete until set. To form the better bond with the concrete, the inner brick are wedge shaped. This brick face was again covered with stucco and marble veneer, and finished with marble pilasters, cornices, balustrade and statuary, now all removed, though the massive stone portico remains, with its granite columns 40 feet high. The outside of the dome was covered with gilded tile, carried away some 1200 years ago and sometime since replaced by lead. The inside with its deeply coffered soffit, was enriched with heavy bronze plating, removed and recast, first into cannon and afterwards into the canopy, 90 feet high, over the high altar in St. Peter's. This great building has but one entrance and no windows yet is flooded with light from the circular opening in the centre of the top, 30 feet in diameter, though appearing from below not one third of that. Storm and sunshine falling through for 19 centuries, have wrought no more damage than would a single year in our climate and buildings.

Rome has no doubt passed through many building booms, and is still disfigured by many evidences of the last one, some years ago. Dozens, if not hundreds of large buildings, 4 to 7 stories high were erected, many of them still unfinished, though not perishing as they would here. These contain a great many rooms, usually surrounding a square central

court, and in the case of chapels, have arcaded galleries from which the several lower stories are entered. The court is not roofed over, but is nicely paved and opposite the main entrance has always a fountain, cascade or grotto, with more or less sculpture and foliage about it, and the water flowing perpetually. The ground floor rooms opening to the street, which may be very wide or as narrow as 4 feet are rented for stores, workshops, tenements, stables, &c., the upper portions as hotels, flats, &c., and even in palaces, the second story is generally rented as tenements; the palace proper, with its higher ceilings and magnificent rooms, beginning with the third story.

In Italy no building operations have ever been carried on except by the state, the church or the nobility—the great unwashed being retainers or tenants, paying rent or not. The present nation is composed of a great many former principalities, duchies, &c., each with its royal family, and when united, some 25 years ago, from one of these was selected an hereditary king. In all these cases the title descends to all members of the family at their birth. Hence the frequent mention of princes and palaces. The only other buildings are monasteries, tombs and theatres—churches and chapels being nearly always an adjunct to the palace or monastery.

These buildings, which might be residence, museum, store or factory, are fireproof, and should be inexpensive, being constructed entirely of the commonest brickwork, with all ceilings flat vaulted in brick or concrete, the haunches levelled up to form floors of cement, tile, marble or mosaic. The mosaic floors in many museums and palaces of to day have been removed from the more ancient homes of the Caesars, and with their rich and everlasting colors blending like brushwork, no more beautiful or durable flooring can be imagined.

Balconies, theatre galleries, &c., are formed by very flat and thin arches of rudest brickwork, or of concrete, springing from light iron beams, projecting or supported. Pilasters, pedestals, brackets, cornices, &c., are also roughly formed in brickwork, the whole afterwards to be completed in stucco, adding also to their strength. After the raw brickwork has stood for a year or more to settle and season, may be for centuries, the frames are set in openings and the finishing commenced. These frames may be of pine or of marble, and may have marble or stucco architrave finish, oftener plastered jambs without casing, and never is any wood used for casings or base, floors, partitions or stairs. The effect of lines of moldings for casings, base and room cornices, in common buildings will be produced later by shading in distemper, as part of the decoration.

Though the roughest of pine is used for doors, sash and blinds, their joiner work is excellent. Inside and outside shutters are used, and casement sash in all cases. All are heavy, fit perfectly, and the hardware is of the best and most durable description. Doors of very great age may be seen, of cedar and walnut still in the raw state, with panels, 2 feet wide and without sign of shrinkage. They are not exposed to furnace heat, they are in a dry climate and uniform temperature. Large doors or gates entering the court are made in pairs, very heavy, and are thickly studded with large pyramidal headed wrought iron nails. Such doors always stand open during the day. Just at this door or passage is the office of the porter, a person always in demand, and indispensable to the stranger. In all royal palaces he is a most imposing and gorgeous flunkey, selected for his great stature, good looks and stock of ready information. He is robed in scarlet with gold lace and cocked hat, yet accepts a tip of half a lire or ten cents more thankfully than a dollar would be taken here.

Church doors are nearly always open, but are provided with a heavy padded leather hanging, to shut out street sounds and avoid the constant banging. A lower corner of this will be lifted aside by one of the beggars always at hand, who will very gratefully accept the smallest copper coin. Visitors walk about freely inspecting every part of the interior, while mass may be going on at any number of the altars, or they may be conducted by an entertaining sacristan, priest or monk to the more sacred or interesting places and objects; tip from 10 cents to a dollar.

The exterior of buildings, generally will receive a finish of stucco, grey or colored, or of marble or a combination of both, forming pilasters, brackets, balconies, cornices, &c., to represent cut stone. In Rome the object is not to deceive, but if it were it would be most thoroughly accomplished. In that climate everything is durable. The traveller going from Paris to Rome would suppose the latter to be built of stone, while going from Rome to Paris he would suspect the use of stucco, and would be mistaken in both instances. The new "Banco Romano," however, directly in front of my hotel, was being built of stone as if in Paris. The building was quite sound, even if the institution was rotten! Indeed this street, "Via Nazionale," has been engineered on Napoleon's idea. It is a new street in an air line from the modern railway station just inside the walls, direct to the ancient heart of the city, cutting down hills, levelling up valleys, hiding ancient ruins and slicing off palaces, gardens, &c., doing much more damage, in the opinion of the antiquary, than can be made up for by the magnificence of this modern innovation.

Roofs are in many cases left flat, and finished in cement, the same as floors, often supporting a considerable depth of soil, with orange and other trees, gardens, pavilions, statuary, &c. Lead is used on domes and similar structures, but the almost universal roof covering, from the palace or basilica down to the farm outbuilding on 4 poles, is the common pan tile, laid to about a quarter pitch. Such roofs have wood and iron framing, and this is about the only timber used in buildings. In such cities fires are of very rare occurrence. Only in a basilica could great damage be done, while in ordinary buildings the roof might burn off without in the least disturbing the inmates below.

Coffer ceilings are to be found only in basilicas or other very large halls extending up to the roof, as when a court may be roofed over. In such cases very heavy masses of enriched wood or stucco moldings are used, colored and gilded, and the panels filled with fresco paintings. To see and study these comfortably mirrors are used. All interiors are more or less enriched with modelled stucco, gilding, glazed porcelain, mosaic, precious marbles and real or imitation fresco. America affords no opportunity of enjoying the glorious effects of fresco. Our buildings have many windows but scanty light. Roman buildings, such as churches, art galleries, &c., have no windows as prominent features,

*Paper read at the fifth annual convention of the Ontario Association of Architects.