

three chief causes of the failure of traps. These are evaporation, momentum, and syphonage. If a trap is unused for a long time through the house being unoccupied the water is evaporated; this can be overcome by pouring in a little glycerine, which will cover the surface of the water, and will not itself readily evaporate. The second defect is due to the flush entering the trap with too great a force and so carrying away some of the water necessary to give the seal. This can be overcome by a little care in arranging the flushing apparatus. The third kind of failure, syphonage, is occasioned by the air on the drain side of the trap being drawn out by a charge passing down the main soil pipe. This is remedied by introducing ventilation or anti-syphonage pipes.

The lecturer then showed on a screen a number of types of water-closet, explaining briefly the characteristics of each. In conclusion he mentioned the following books as likely to be useful to students of plumbing.—Hellyer's "The Plumber and Sanitary Houses," "Principles and Practice of Plumbing," and "Lectures on the Science and Art of Sanitary Plumbing;" J. Wright Clarke's "Plumbing Practice," and "Lectures to Plumbers;" P. J. Davies' "Practical Plumbing;" Middleton's "House Drainage."

#### BUILDERS' EXCHANGES AND THEIR BENEFITS.

For many years the impression has prevailed that the principal or general contractor for a building should be a carpenter. Now, in many places, and in fact wherever stone, bricks, or structural steel predominates or enters largely into the making of the structure, any one of these trades may, and frequently does, assume the general contract. Competition being stimulated, a closer economy in construction must be observed. This has created a growing demand for craftsmen and overseers of the highest degree of intelligence and education along constructive lines so that every detail might be thoroughly understood and wisely guarded.

And as this same "higher education" is needed to estimate accurately, it is obvious that the principal contractor, of whatever trade, cannot afford to ignore or dispense with any valuable helps to a successful competition.

The Builders' Exchange comes in here if an "Exchange" it be,—a veritable school of instruction in which men in daily contact with the best and most progressive representatives of their fellow-contractors and tradesmen, inevitably involve a condition eminently above the man who prefers to follow his own selfish lines and notions, fearful lest some one might profit by a suggestion made by him in an unguarded moment. Confidence between men of integrity—and it is presumed only such shall be admitted to an Exchange—cannot fail to strengthen each one in his individual occupation, and collectively the Exchange is sure to be such a factor in public affairs, as will command recognition and respect when concerted action is needed to secure wise legislation upon matters relative to any department of architectural improvement and structural development.

As touching confidence as essential between builders, I am pleased to quote Judge Wing, of Cleveland, who, in a speech at a banquet of builders in his city recently, said—"I think this may be taken as certain: that no man was ever injured in his business by praising the business of another; and that no man was ever left wholly uninjured who decried the business of another."

One of the many benefits to the builder was expressed by Mr. Conlon, Vice-President of the Lovell, (Mass.) Exchange, at their annual gathering a few weeks ago. He said—"The architects are coming to regard membership in the Exchange more and more as a standard of merit and trustworthiness."

It is my firm belief that this standard is an object not merely aimed at, but realized by the many Exchanges throughout our country, their method being to thoroughly investigate every applicant for membership, in order that his honesty, business integrity and ability to perform his contracts, may be assured before he is admitted to membership.

The benefits to the builder from a well equipped and properly conducted Exchange are manifold and cannot be

enumerated here, neither can they be estimated in dollars and cents, for, as a man's capabilities in any honorable calling of a public character are enlarged, more apparent become his possibilities as a representative citizen in all public spirited and progressive movements, thereby broadening the opportunities for advancing the interests of his particular calling.

As has been said by a writer upon this subject,—“A Builders' Exchange is a business organization and not a social club.”

Here business men meet for business, during a stated business hour, and a rendezvous of this kind affords opportunity for business intercourse between allied branches, whereby is accomplished in an hour or less what frequently requires days to accomplish on the outside.

The business of the builder, whether he be operating largely or not, is located in many places at the same time, and if by means of the Exchange rendezvous he can see his sub-contractors, dealers, architect, and owner, too, and they in turn having need to see the builder, the benefit is apparent. Correspondence and telephones will accomplish much when no better facilities are available, but experience has taught that nothing is so expeditious, so definite and so satisfactory in every way as a face to face interview with the people you need or who need you, especially when amid congenial surroundings where the very atmosphere savors of the business in which you are engaged.

An exchange should be all of this, but as the universal law of sowing and reaping applies here, the builder, in order to reap benefits must sow aright—keeping faith with his Exchange by punctuality and regularity in his attendance, and by a generous, trustful and loyal spirit towards his fellow members.—John M. Hering, Secretary Builders' Exchange of Baltimore.

#### SEATING IN ENGLISH CHURCHES.

It seems the nave was formerly paved and entirely open, but gradually, dating from the sixteenth century, low benches were introduced, and later in that century we find in a few churches single pews or seats set up, but these appear, during that and the following century, to have been made movable. Weever says, "Many monuments are covered with seats or pews, made high and easy for parishioners to sit or sleep in, a fashion of no long continuance and worthy of reformation." But the fashion unfortunately increased, and in time even these high pews, as well as the solid open benches of earlier date, were gradually raised higher and higher by additional framing; and the proper direction of the pews, which even at first was preserved and made to face the altar, became disregarded, and by cutting away the middle framing, two pews, and more often benches, were thrown into one and cross seats were added. Thus came into existence the high square pews, with their many easy and comfortable nooks and corners, formed, as it would seem, for no other purpose than to encourage sleep.

#### STONE FOR MOSAIC.

The Greeks at first preferred marble to any other material for mosaic, but in course of time as they introduced new methods and ideas they came to use glass in one form or another, and under certain circumstances bone, ivory and mother-of-pearl. The main reason why marble was abandoned is not far to seek, for it is evident that chemical mixtures of glass and colors together with the advent of gold and silver leaf under the glass, produced, a wonderful splendour and artistic effect previously unknown. The effort to reduce mosaic art to a representation of paintings made it necessary to improve the material, and, therefore, colored enamel of various shapes and sizes were introduced, and of different shades, with most delicate tints and half-tints. The end of the 17 century, therefore, witnessed the restoration to favor—to a great measure—of mosaic, and it was very widely used for the reproduction of the paintings of the great masters.

Four hundred incandescent lamps are required for the proper illumination of the new clock in the tower of the Municipal buildings at Toronto.