least indication that hollow tile is an unsuitable material for fireproof construction. On the other hand, this test, as well as others that have heretofore been made, should satisfy the Board of Examiners of New York that its discrimination against concrete construction as a fireproof material is no longer jnstified."

The conflagration which occurred at Pittsburg last May has furnished the latest and most interesting test of the behavior of large steel framed buildings subjected to the effects of intense heat.

The chief damage to the frame of the Horne department store was caused by the falling of a large water tank which was supported at the top of the building upon unprotected steel beams. In falling it displaced some of the beams and ruptured the fireproofing in proximity to them which allowed the heat to warp and twist the steel work of the sections involved. But elsewhere the steel frame was practically uninjured, although in many places the tile protection of the columns and beams was displaced by heat and water. The tile floor arches, in many places also, were partially destroyed, the lower shell having fallen off. The displacement of the tile protection by the force of the water, however, did not take place till the worst of the conflagration was over, else the heat would have warped the exposed metal work to the practical destruction of the buildings.

The lessons of the Pittsburg fire are the most valuable of any which have yet occurred in steel frame buildings.

The relative value of fire proofing material was demonstrated in the following order :

1st. Terra cotta lumber or porous terra cotta.
2nd. Hard burned clay of the hollow arch type.
3rd. Concrete.

The use of these materials saved the buildings in which the various constructions were adopted.

The continuous ceiling of the top storey of the Horne department store was the most effective in preventing damage to the material it protected and suffered the least deterioration in itself.

The weak point in the girder protection of the departmetal store (Fig. 3—see illustration pages) was the method of covering the soffit, viz., a flat solid tile clamped to the web of girder with metal which was only protected by the plastering.

Many of the skewbacks had the lower portion of the outer shell broken off permitting the dovetail soffit covering of beams to drop off.

The bottom shell of the floor arches was broken and dropped off, not impairing the carrying capacity of the floors, however, as the webs were left intact.

The blocks covering columns were not properly attached to the columns and but slight concussion or expansion sufficed to throw them off.

The fire-proofing of the Horne store and office building (Fig. 4—see illustration pages) adjoining the departmental store suffered less damage than that of the store building, even where the heat was quite as intense. The material was terra cotta lumber which is burned with a considerably less admixture of sawdust than is the case with porous terra cotta.

Here, however, the same weakness at the skewbacks and soffit tiles was developed. There was practically no breaking off of the lower shell of the floor arches.

The floors and the strips to which the floors were nailed were completely burned out and the cinder concrete between the strips was reduced to ashes, thought to be on account of the unburned cinders in the composition.

In the Methodist Episcopal building, which was of concrete floor construction, (Fig. 5—see illustration pages) the test was not as severe as in the store buildings as it was divided into numerous rooms by wire lathed partitions and had not as large an exposure of windows facing the building where the fire started. The most serious damage was done in the stair well where an unprotected beam was badly warped.

The heat caused some sagging in the ceiling of the top flat which was one of suspended metallic lathing and plaster. One or two of the floors also sagged an inch or two where exposed to great heat. Portions of the partitions which were of wooden studs, metallic lath and plaster, were partially destroyed, but proved to be in a measure fire resisting.

Another interesting fire occurred in a Detroit storage warehouse. It was of skeleton construction, but the floors were of the type known as mill construction.

The columns and girders were fire proofed with terra cotta blocks and while the fire developed an intense heat on account of the nature of the contents and the wooden floors, the frame remained in place, but was sufficiently warped to displace some of the outer walls and necessitate practical reconstruction.

Some of the most experienced architects of New York are strongly of the opinion that in buildings of the office type, divided by numerous partitions, the ordinary method of protecting columns and beams is quite sufficient, while some go so far as to think that sufficient heat cannot be generated in these buildings to make it necessary to more than plaster the soffits of the beams.

The experience of the conflagration at Pittsburg, however, points to the necessity of far greater thoroughness in the case of buildings of large undivided areas filled with inflammable stocks and having large exposed window surfaces.

If such great floor spaces are indispensable, and if some means of protecting the windows is impracticable, the only way to save the steel frame from destruction in a conflagration is to so completely protect it that the enormous heat generated will not have an opportunity of penetrating the envelope till the fire has burned itself out. In other words, to so construct the building that it will resemble an enormous stove—able to withstand the consumption of its inflammable contents without injury. The duration of a fire in a building of this class has been demonstrated to be not more than an hour or two, while the destruction of the inflammable contents is much more thorough than in a building whose floors collapse quickly.

Porous terra cotta floor arches, either of solid material or having an extra thick shell, flush ceilings, and at least 2 inches of terra cotta beneath the bottom flanges of the girders, would seem to be requisite for the protection of the floors, and the substitution of porous blocks for the filling on top of the arches instead of the usual cinder concrete.

For the columns at least a thickness of three inches of porous terra cotta blocks dovetailed and fastened so that the destruction of one will not displace the rest. Casing the blocks with wire lathing well secured would add greatly to the safety of the columns and defy any amount of heat likely to be generated.

A weak point in the Horne departmental store was developed by the behaviour of the steel lintels over the large window openings. Being poorly protected they warped in several instances, destroying a portion of the walls above.

The application of water, save for the protection of adjoining premises, is undesirable after a fire has got beyond control in a fireproof building ; owing to circumstances the firemen were driven from the Pittsburg stores and devoted their attention to saving surrounding property. After the buildings were somewhat cooled water was again applied. It is owing to this that the loss on the terra cotta was comparatively light, being appraised at about 5% of the value of the whole.

A new material for the protection of steel and iron from the effects of heat is being introduced in the shape of asbestic plaster. There are no details at hand with reference to any tests on full sized structures. A test was recently made in Washington on a miniature house about 4 feet high. A fierce fire was kept up for half an hour without damage to the building. Then a heavy stream of water was poured upon it without, it is said, in any way injuring or removing the plaster. It is claimed that it can be heated to red heat (1100 degrees Fahrenheit) without harming its durability, and that nails may be driven into it without causing cracks, also that it will only dinge, not break, when it is struck with a hammer, and that it is elastic, stretching with the