

where it is more injurious than if allowed to escape alone into the air. The soot coming in contact with metal, stone and decorations is made to adhere firmly by means of its tar content, in reality covering the surface with a coat of black paint. The acid is not readily washed away by the rain, but continues to act until it is all used up. This acid, absorbed from the air by the rain-water, would be more injurious if it did not drain from most surfaces before its action is completed.

DETERIORATION OF BUILDINGS AND BUILDING MATERIALS

After considering the various phases of the chemical composition, one can readily understand why houses in a smoky atmosphere look grimy and miserable; and also why the use of skylights is, in many places, made impossible, while, in others, it is necessary to so arrange them that they may be readily cleaned. Without frequent cleaning such skylights would soon become useless because of the accumulation of soot. Again, changes in design to make a different arrangement of drain pipes, are, at times, necessary in order to prevent the splashing upon the building of rain-water containing soot.

In a smoky city, too, much more glazed tile and vitrified brick are used for the outside of buildings, as it makes the cleaning a comparatively simple matter — washing alone being necessary. Building stones, such as limestone, marbles or sandstones with calcareous binding material, are rapidly disintegrated by the acid in the soot and air. Therefore, materials such as granite, sandstone (with a silicious binding), and brick, which are not attacked by the sulphurous and sulphuric acids in the soot, should be utilized. But, unfortunately, that stone which is most easily affected, disintegrated by the atmospheric acid and decolorized by soot, is the one which is easiest to work into the desired shape for building purposes. Granite and similar stones, which are practically never attacked by acid and are impervious to moisture, offer little chance for the soot to lodge. They are readily cleaned, but are extremely expensive because of the difficulty in working them. Thus the architect finds himself confronted with financial as well as æsthetic considerations. Stone may be cleaned but, at most, that is but a temporary expedient and represents a periodical tax on the owner. The logical thing is to make cleaning unnecessary by water-proofing the stone and doing away with the smoke. The sulphuric acid acts on calcium carbonate, (the principal constituent of stones, which is most easily corroded by the acid in the soot), forming calcium sulphate (gypsum) which is more soluble in water