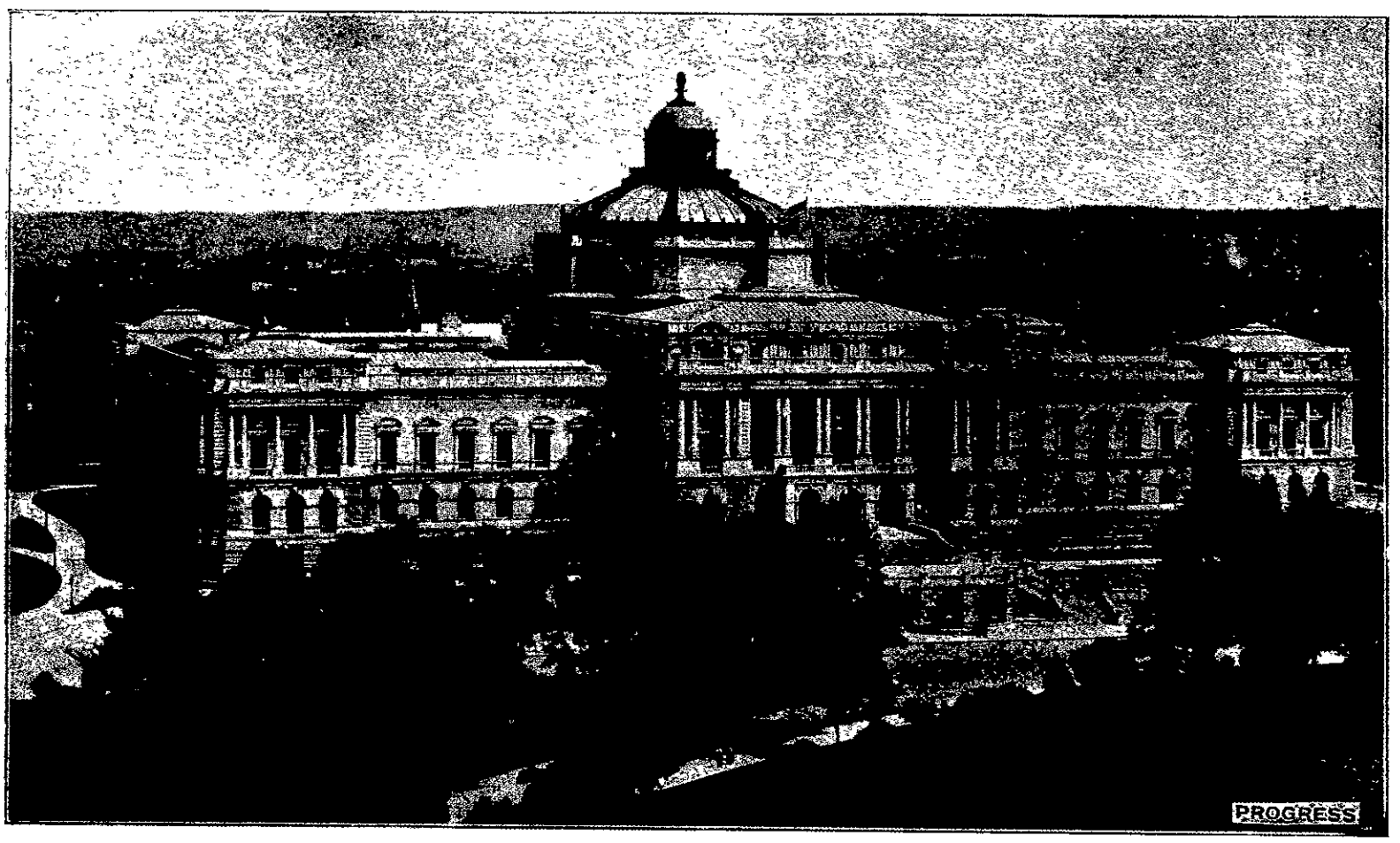


UNITED STATES CONGRESSIONAL LIBRARY AT WASHINGTON. THE DOME IS COVERED WITH PURE GOLD.

methods; while in the United States lumber has been available, cheap, and most readily adaptable to building uses. But, fortunately in this respect at least, lumber has been steadily advancing in price until some grades have increased as much as 150 per cent. during the past few years, while steel, brick, stone, cement, and the clay products have been gradually decreasing in price, until there are good commercial, as well as civic, reasons to hope that the hitherto Utopian accomplishment of universal fire-resisting construction may soon replace the era of jig saw and wood frame. Independent of the added element of security against fire, fire-resisting construction of the proper materials will be found to be cheaper in the long run, decreasing repairs and insurance premiums, giving immunity from vermin, reducing the transmission of sound, and proving warmer in winter and cooler in summer than the older non-fireproof methods. At present prices adequate fire-resisting construction may be estimated about ten per cent. dearer than ordinary methods of building; but as the deterioration of a well built example of the former type has been estimated to be but one-tenth of one per cent. a year, while that of an ordinary wood joist structure is nearly four per cent. a year, this initial difference is soon overcome

THE CASE OF SAN FRANCISCO.

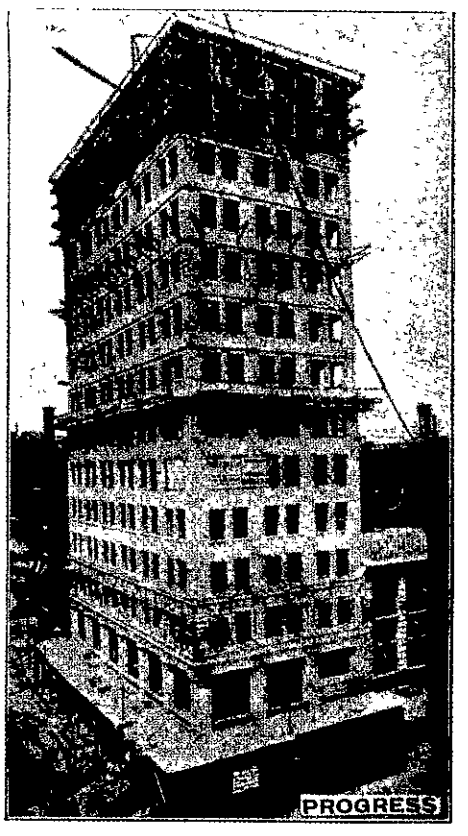
It may be objected that the previous argument in favour of fire-resisting construction is all very well on general principles, but that it has no direct bearing upon the catastrophe at San Francisco, because, in this instance the loss was largely the direct result of earthquake. Even from the earliest accounts of the San Francisco fire this view may be rightly disputed, for reports so far received from the stricken city tend to show that comparatively little damage was done to the modern fire-resisting buildings by the seismic upheaval. The principal earthquake damage undoubtedly resulted to the flimsy non-fireproof buildings, which, in falling to destruction, started conflagration on every hand, through which the better buildings were made to suffer.

San Francisco has long been known as a particularly hazardous fire risk, and insurance officials have even gone so far as to say that it only was the excellence of her fire department that prevented a conflagration long since. To quote from a description of San Francisco written in 1905 "In San Francisco, for instance, there is little being done to improve the standard of construction It is notoriously a wooden city, yet insurance rates are fairly low, because, forsooth, the fire department is so excellent. That is like extolling the advantages of a certain locality as a health resort. It may be miasmatic; yellow fever may stalk amuck; its houses and streets may be foul, but, glory be, its doctors are skilful!"

FIREPROOF IS ALSO EARTHQUAKE PROOF.

Had the construction been uniformly fire-resisting, what a different result might have followed. For it so happens that our present methods of fireproof building are, undoubtedly, the most effective possible against earthquake disturbances. Our city buildings at least, unless they are public monumental buildings, are seldom constructed, when made fire-resisting, of solid masonry. On account of the area occupied by the foundations and piers of the older, solid construction, on account of the added height permissible with steel construction, and also because of its rapidity of erection, nearly all fire-resisting buildings of any magnitude are now built on the "skeleton" or "cage" construction, so called because the vital steel skeleton or framework, consisting of columns, girders, and floor-beams, when riveted together, partakes of the nature of a metallic bird cage—strong, rigid, and proof against distortion. The introduction of these methods in Chicago was the direct outgrowth of the necessities in the larger American cities for centralisation within limited business areas, thus requiring the extension of buildings into the air to secure added floor space. This need was also felt in San Francisco, and the last previous seismic disturbance of any severity in that city having occurred in 1868, the introduction of steel-skeleton buildings in Chicago and New York in the latter "eighties" immediately raised the question as to whether such construction could be made safely to withstand any earthquakes to which the locality of California might be subjected. The question was much discussed by architects, builders, and structural engineers, until, in 1890, the skeleton-construction Mills building was erected in San Francisco by Mr. D. O. Mills, as an evidence of his, or his architects', faith in the efficacy of this type of building. This faith was founded on the knowledge that steel frameworks of this character can be so designed as practically to permit of bodily overturning before failing in any portion. Indeed, in very high narrow buildings, exposed to severe wind pressure, it is no uncommon thing to anchor down the windward columns against possible overturning. Hence, in localities subject to earthquake, the only serious danger would be in the construction or safety of the exterior masonry walls, and this is accomplished by tying in the brick or stonework by metallic anchors attached to the steel frame. The Mills building was soon followed by other similar structures, until, in 1897, the nineteen story Spreckels building was erected, 300 feet high; and it is well to know that later accurate accounts completely show that these steel buildings were practically immune from earthquake damage, succumbing only to the wide-spread conflagration caused by the demolition of inferior, non-fireproof structures.

The author concludes with a plea for the passing of more drastic building regulations by State legislatures.—*Carpenter & Builder.*



A FINE EXAMPLE OF CONCRETE CONSTRUCTION INGALL'S BUILDING AT CINCINNATI, O

Growth and Conversion of Timber.

THE natural growth of a tree not only indicates the nature of its wood as timber, but also its uses in various capacities in building and other work. It is not out of place to review the growth of the tree and its conversion, and use for various purposes, the most simple of which is the natural wood as