

### A PENDING QUESTION

Society and engineering are correlative terms; as the former has developed from the simple conditions of pastoral through the several civilizations of the East to the present one of Europe and America, with all its wonderful complexity, great range and increasing activity, so has the science and practice of engineering developed from rude and empirical practice to achievements limited only by the possibilities of applied science, and the demands of human society. It has established lines of communication between the markets of the world, in spite of nature's stoutest opposition, invented processes for reducing nature's crude materials and designing them into forms that unite beauty with strength, precision and delicacy with stability, and stability with boldness of construction, not long since considered chimerical; the scientific application of sanitary laws, that has made the modern home possible, and the growth of certain communities into great centers of trade, commerce, science and art. The science and art of engineering is thus one of the handmaids of modern civilization, and the engineer may well feel a peculiar pride in a profession that calls for the highest order of human achievement, and the progress of which modifies or moulds in so large measure, the world's life. Thus the science of engineering has its *raison d'être* in the very nature of things, its work has been wrought, because society, ever changing, ever developing, has demanded it; though never realizing, that with the fulfilling of each demand, there is imposed upon it a corresponding responsibility, that must be met and shouldered sooner or later. The thought is illustrated by the relations that have developed between the railway corporations of our country and those whose interests they are supposed to represent, and the effect of their example upon the people. Both are aptly emphasized by the history of the Pacific Railways, and both present serious problems demanding solution. Problems

that cannot be avoided, that must be met, and if met with wisdom and prudence, we will merit the blessing of posterity. If we are found, wanting, found unable to cope with social conditions, for the existence of which we are responsible, we will but burden succeeding generations with mighty questions whose added weight may become too great to bear.

As to the Pacific Railways.—During our civil war the Government felt the necessity for more rapid overland connection with the Pacific coast. The construction of such lines of railway was felt to be beyond the reach of private capital. In 1862 Congress passed an act donating a certain amount of the public lands and guaranteeing some of the bonds of Pacific Railway Companies. Two years later the land grant was doubled and the companies relieved from paying any interest until 1897, when the principal would become due. This action of Congress seemed to be a necessity, because it was thought that it was going to cost much more to build the road than was at first supposed. The first sections, however, were built at surprisingly low figures, but the immense saving, instead of going to liquidate the company's debt to the United States, fell into the hands of the members of an unscrupulous construction company, whose name has become a byword—the Credit Mobilier. This company was largely composed of the stockholders of the company, who thus made contracts with themselves, on such terms as to fill their own pockets, but rob the company and the Government. But even when thus depleted, it was found that the company was able to pay something above its fixed charges, and the attempt was made through the U. S. courts to compel it to do so, but without success. Then came the Thurman Act of 1878, by the terms of which 25 per cent. of the net earnings with certain other contingent sums should be paid to the United States, to be invested in government bonds, these to form a sinking fund to provide for the redemption of the debt at maturity. Then comes a second period of rascal-