Herein however, lies its danger. The facility of reproducing in any quantity a given design, whether it be a carved panel or a moulding, is apt to degenerate into machine work and lifelessness unless carefully watched.

It is beginning to be used in the States, where they are also making it, but with only partial success as yet. The results of my endeavours to use it here were not very encouraging, but doubtless, when they understand the manufacture of it better, the result will be more satisfactory.

I come now to an important material for constructional purposes and one which will in all probability come more and more into use, viz., *iron*. This is almost entirely a modern material as regards its use to any large extent in architectural or engineering construction. It was, you may say, entirely unknown for this purpose to the Greeks, the Romans, and the mediæval builders, and the uses to which it was placed was in the shape of tie rods to tie the springings of arches together, which had in sufficient abutment as in many of the Italian Gothic buildings and monuments; or in the form of a chain to equalize the thrust or pressure as in the domes of St. Peters' at Rome and St. Paul's, London.

It is an interesting question to know what the builders of the great cathedrals and monuments of antiquity, would have made of iron, had they been as conversant with it, as we are.

The wrought iron of the mediæval ages and of even earlier times, is so lovely, in the uses to which they put it, as in gates, railways, grilles, screens, balconies, etc, that one would fain believe that they would have been able to shew good work with the other also.

It is in this material that engineering draws closest to architecture.

Before the era of iron, and the inauguration of railways, adoption of drainage schemes, water works, etc., all work such as bridges, buildings, etc., which we would now call more distinctively engineers' work, was designed by architects and was considered part of their work. Your Chairman will not, I am sure, feel aggrieved when I say that the engineer was unknown.

Those benefactors of their race had not yet risen upon the scene, as a special class.

But for the reasons I have named and partly owing to the apathy and conservatism of the architects of the time, the men who devoted themselves to the problems of the new forces then awakening, came to be designated by the name of engineers. Those of you who propose becoming engineers have a noble ancestry numbering many talented and great men. You are the heirs of noble achievements and the future of your profession has even brighter things in store. I suppose that the era of bridge-building in stone is over and that iron or steel will be the almost universal material. From an artistic point of view one regrets this, as to my mind there are no modern bridges so satisfactory in appearance as the well defined old stone bridges.

Waterloo Bridge over the Thames at London, not to speak of London Bridge itself—many of the bridges across the Seine at Paris, the Bridge of St. Angelo, at Rome, the Rialto at Venice, the Ponte Vecchio at Florence, What poetic associations around them! What apparent strength and dignity they have as linking shore to shore they span the turbulent river, as if rebuking the restless rush of the waters!

But all these I suppose must go, before the approach of iron, like the old three-deckers and ships of the line, before the iron-clads. The old stone bridge and the gallant ship with every sail set, were favorite subjects for painters, but who would sit down deliberately and paint an iron-clad or turret-ship, such as the "Devastation" or "Thunderer," or an iron bridge in all its gaunt ugliness. But this is a utilitarian age and the "almighty dollar" is the standard alike for judging men, buildings and bridges.

But with this dirge for the disuse of stone bridges I must freely confess that iron and steel are most valuable materials in architectural and engineering structures, and have made possible the bridging over of wide gulfs and raging torrents, and even seas that would otherwise have been impossible, and also the covering over of large interiors such as markets, railway stations and halls.

Unfortunately when it was first used its utility was all that was thought of, and its appearance was never considered, so that strange and ghastly abominations, speedily began to loom up and confront one in the streets and hang over the rivers like a nightmare, and engineer's architecture became a by-word and a reproach. Mr. Ruskin has lately been lecturing on the plague cloud of the 19th century and attributing it to the degeneracy in the morals and manners of the age. I think he might have included in the list of causes certain engineering monstrosities.

Of recent years, however, there have been great improvements, and when engineers have worked in conjunction with architects, the result has been much more successful, as for example the new St. Pancras Station, in London, the new railway station in Philadelphia and others.

It has begun to dawn on the minds of engineers a directors of railways and others, that a thing may be both ugly and dear, and that a bridge or roof designed on graceful lines with features pleasing to the eye, even without any ornamentation, may be constructed quite as strongly and economically, as one which acts as a constant irritant on a mind with refined instincts and tastes, and is a perpetual blot on the face of nature.

I believe there is more scope for the successful use of iron or steel in engineering works than in architectural. The engineer has been forced by his very circumstances to create new forms and is therefore untrammelled by old ideas and is free to superinduce on the constructive skeleton such features as may make it graceful and growing naturally out of the construction.

The great danger is that to save trouble the engineer will do pretty much as the architect has done, take stone or brick details and have them cast in iron or hammered out in wood work forgetting that the nature of the material must give the key to the shape of detail and mode of ornament and that instead of a genuine ferruginous ornamentation we may have simply a sham stone ornamentation, and we may even consider ourselves happy if it be not painted to imitate stone with the lines and joints of the sham masonry shewn on.

If this be so then there is an end of all hope of improvement on these lines.

To be continued.