much older than himself, and one of whom has obtained a wide reputation in engineering. Of course, no one will deny that old men must be respected; nevertheless, a young man ought to have liberty to criticize the work of the old, especially when we remember that a man is supposed to know much more than his grandfather did; and by this way only the modern sciences are to be advanced. If there be really any faults of design in the Japanese railroad bridges pointed out by Mr. Waddell, he ought to be entitled to say so, more especially as he tells us how to build bridges that have no such faults.

In the *Engineering and Mining Journal*, I read, a few days ago, the following in regard to the adoption in England of an American process of smelting lead, and this has some relation to the matter. "This is another recognition of the fact, which is becoming more and more generally known, that in practical metallurgy, as well as in many other branches of engineering, this country is leading the old world. The high prices of labour and supplies, and the intelligence and practical genius of our people, have made them quick to test and to adopt improvements for effecting economies, and our superiority is due to a total disbelief in the worship of precedent, which paralyzes in a measure the progressive instinct among European engineers, and makes it difficult to secure the introduction of improvements there."

It seems to me that Mr. Waddell's critics are Englishmen, as is natural, because his book attacks the English system of bridge designing. The American system of bridge designing and the English system are totally different, and any one who has read the book through must see that either Mr. Waddell's system is right, and that the English is entirely wrong, or vice versa. Of course, the Americans will say that theirs is right, so we cannot accept the last letter by an American which you published, except as a biased opinion. To decide the matter impartially, we must find out the opinion held by the best English engineers, and I will now quote the following from the Presidential address of Mr. Benjamin Baker, who was elected as president of the Mechanical Section of the British Association. He is, in fact, the highest English authority on bridges. He writes thus: "It is an open secret that nearly all the large railway companies are strengthening their bridges, and necessarily so, for I could cite cases where the working stress on the iron has exceeded by 250 per cent. that considered admissible by leading American and German bridge-builders in similar structures. In the case of old bridges the variance in strength is often partly due to errors in hypothesis and miscalculation of stresses. In the present day engineers of all countries are in accord as to the principles of estimating the magnitude, but not so in proportioning the members, to resist those stresses. The practical result is that a bridge which would be passed by the English Board of Trade would require to be strengthened five per cent. in some parts, and sixty per cent. in others before it would be accepted by the German Government, or by any of the leading railway companies in America."

Further on he says:—

"In one respect the practice in America tends to the production of better and cheaper bridges than does our own practice, and it is this:—