express the idea in one single word—"Civilisation" itself to the efforts of the mind and body of the mechanical engineer, and to the mechanism which he has created Indeed, so triumphant is the result of his labours in these latter days, that it is no unreasonable boast to add that we may confine our thoughts on it to a very limited range of time, for in mechanical engineering, unlike the work of the poet, or of the sculptor, or the painter, or the architect, we have not to go back to past ages to find its triumphs In fact, so little is to be gleaned from antiquity, that the president declares that he will not be tempted even by the great name of Archimedes to advert to ancient engineering; but will limit himself to the lives of those now present amongst us. Now, this is really to say a triumphant thing, and to mark the age in which we live with a mark which cannot be missed or mistaken—for what more can be said? Who else can make such a boast as this, and with so much of truth in it. But is it in truth, and in logical fact, the whole truth, and a thing so very much to be boasted of Ought the age, the nineteenth century, to be so very proud of this absolute supremacy of mechanism. The machine doing all things, all but thinking for us, certainly communicating and recording our thinkings. Almost monopolising them. We are inclined to think, looking about us for a brief moment, that there is far more in the nature of things than this; and that even the conversion of a "tea-kettle into a locomotive" may be surpassed, at least as a matter of human interest and feeling.

It is, by way of illustration, not a little curious to note the distinction between the past and the present, in their mode of work, and in the character of the work produced, and in what is perhaps more, the mental impression made by the work after it is, by whatever means, brought into being. Of course, we all allow, without a word, that the more easily and cheaply necessaries, of whatever kind, are brought into existence, and distributed, the better it must be for human nature generally; and did the machine but stop here, no one could say a word. But it so happens, that the machine which does one thing so well, and so cheaply, and in such quantity, may be made, and is made, to do other work, and pretty nearly all work. The all-potent mechanism can, as the engineer boasts, manufacture nails and sweet biscuits, by the ton, and that it can do almost without touch of the human hand. all we have to do is to stand by and look at it at work. It is simply marvellous. But it can also,—and here it is that the artist has good reason, now-a-days, to tremble a little,—not only make bricks, and saw and plane timber, but it moulds them into "gracious forms," and, what is more in every stage of the manufacture and making of the materials which form our garments, from the very coarsest to the very finest, it can, and does do its entire and triumphant work. From the finest lace, says the president of the engineers, to the sole of the stoutest boot! Indeed, it is even so. It is no exaggerated boast. He stops here as a faithful mechanician is almost bound to do, but we may ask again, is this all pure gain? Is there nothing wanting? Is it a complete triumph, and a national success, when it is said, that the "machine" is driving the human being fairly out of the field, and doing all his work for him?

And while this is, as must be confessed, no exaggerated or enthusiastic statement, but a sober fact, that machinary, even now, is doing almost everything, more or less perfectly, which the human hand in less advanced days did sometimes so very well, it is not enough for the future of engineering aspirations, for we know, and no man certainly can deny its possibility, that within the next fifty years "great inventions will be made," and we are sure that any one, looking back to the condition of things in engineering science at the present time, and compairing it with that which he will then know, "will wonder how it was that the men of this day failed to make many a grand discovery which, at that time to him, will be as familiar as the steamboat or the locomotive is, now-a-days, to us!" We think we might even go further than this in mechanical prophesying, for what is there to hinder the production of everything about us, or which we see, or make use of including even "gracious forms," as the president has it, but the putting the machine to it Art,—*fine art*,—for example, to take an extreme case; why, as it is, statues are all but the result of elaborate and ingenious machinery applied to the formless marble block. They may be, and are, multiplied almost indefinitely by aid of machinery. Pictures,—there are many who may not know it,—are copied, if not actually produced, both for export and import, by machine processes, the hand of man doing but little else than touch up and dovetail together discordant parts. A wonderful process, and ingenious enough. Of architecture we need but to name it, for where would the smart "ornamental moulding" of the shop be were it not for the all-potent machine which produces it by the mile? We do indeed, own, as we are reminded, our dwellings, as well as our clothing, to the skilful labours and thoughtfulness of the mechanical engineer. It would be a right curious inquiry to go through, specification in hand, a quite new and smartly-built modern dwelling-house, and note down accurately the details of work—the pure and simple work, by the hand of the workman; and on the opposite page of our notebook, the work done wholly by the power of machinery—by almost living mechanism. And then we migh go a little further with the said inquiry and afterwards quietly compare the final result when all is accomplished—the perfected modern house with a dwelling-house of the same size, built in a past age, and before any one of our modern mechanical appliances had any existence, and then note well, artistically and otherwise, the difference between them. How things change, as time goes on, and as they appear to different minds, and how that which is looked at by one human intelligence, as a dead antiquity, and a something waiting to be improved away, like a City church, is regarded by another as good "precedent" to go by, to wonder at, and even to try to copy, sometimes, by and through this power of mighty machinery.

But is this, and we ask it once more, *all* gain? It is a good thing, and an advance on the old ways of work, to bring in the mighty machine whenever and wherever it can be brought in, and to discard at the same time the hand of man? Surely it cannot be so, for a something *must* be lost by it; viz, that individuality of feeling which can only be impressed on Nature's materials by the intelligent hand of man! Such a structure as the Parthenon could not by any possibility, by any power of ingenious machinery, be produced. A mechanical dead copy of it might be, there is no doubt, quickly, and may be cheaply, produced, but the whole classic spirit of the great original must needs be lost in the mechanical processes. Of Gothic work, it need hardly be said that it is in its very essence opposed to this mechanical mode of production, and to that uniformity and sameness of detail which is the necessary result of it. The Doge's palace, to wit, could not be carved out by a machine, however, potent, neither could a copy by machinery be made of it. And may not the like be said of every real and individualised work of art, however small and apparently insignificant? It is impossible to infuse soul, or life, or poetic power, into material forms by any power of machinery The dead form may be there, but the spirit is absent.

May we not, therefore, conclude that one, and not the least, of the problems of the future of human nature will and must be, not how much the machine may be made to do, and how far it can be made to take the work from the human hand, but, most momentous thought, where must we stop? Where does the legitimate action of the machine really cease, and where must the hand of the workman and artist come in, and the engine cease its whirling? It is not how far the machine can be made to do all things, including even the production of "gracious forms," in the future, but where is the ability, whether natural or acquired, to distinguish between the gracious form, as produced by a machine and the same form when the result, of the *hand*, directed by the mind, of the artist workman. Then, and then only, will it be found out wherein the true and legitimate action of the wondrous modern "mechanism" lies; what it can do and ought to do, and what it cannot really do. A great problem for the future.—*The Builder.*

Economy of Iron Cars.—An iron car made of boiler tin, with a capacity of ten and a half tons, weighs but 10,000 pounds, while the wooden car of like capacity weighs 17,500 pounds— a difference so great that while 29 loaded iron cars make up a train on the Cumberland and Pennsylvania railroad, 20 loaded wooden cars make up one of equal weight. The iron cars stand the wear and tear of usage better that the wooden, come out of a wreck battered and bent but readily straightened out as well as new, where wooden ones would be shivered to pieces and burnt, and the bolts and bars carried away in a basket. And, moreover, there is about $100 in favor of the iron car over the wooden when their first cost is considered.