

knowledge, apart from its educational value, may in after life greatly aid the workman in his daily toil. The universal success which has attained drawing in continental and American schools, and in our own schools so far as it has been tried, is surely a great recommendation, and it is really a matter of great sorrow to hear the outcry occasionally made against teaching a poor child anything but the three R's. (Hear, hear.) But even with such an education, if it deserves the name, nothing would be lost in making a drawing lesson alternate with a writing lesson. Writing is but the representation of a series of arbitrary signs—it is, in fact, drawing from memory the same as you might teach a child to observe the form of an oak leaf or a laurel leaf, and to represent these forms by drawing; and I doubt very much if it be possible for a person who has never been able to see anything beautiful in nature to produce anything beautiful in art. The instruction given in art schools is not limited to linear drawing, although this must form the foundation of all progress in the higher departments of arts. Painting and modelling are also taught. The true idea of an art school embraces children, as a part of their elementary education, mechanics and working men with a view to their industrial occupations, art students who study art for its moral and refining influence, and those who study ornamental art with a view to design. A training school is established at South Kensington for educating persons to become masters of art schools, and one of the conditions of pecuniary assistance from the department is that he must teach a class of working men or the children of working men, and it is only on these conditions he can obtain any payment. The middle and upper classes receiving instruction in an art school will in most cases pay a fee quite as high as that required by an independent teacher. I believe this art teaching must exercise a useful influence on the character and industry of the country. (Hear, hear.) The pure atmosphere, the glorious sun, the clear streams, and lovely flowers and forms of an agricultural district must be more favourable to the production of correct art with reference to design than the blackening sulphurous atmosphere of a densely-populated manufacturing town, where every green blade of grass has been blasted and withered, and the once pure streams of water now roll perpetual volumes of inky slime. (Applause.) How can men surrounded by such influences create anything beautiful in art? (Hear, hear.) But the mere industrial aspect of this question is, to my mind, the least important. We should all endeavour to cultivate a deep love of art, not for the purpose of ministering to the pride and vanity and wealth of human nature, but as a means of elevating and refining our moral perception, and bringing us into more direct communion with the Great Author of the Universe, who speaks to the souls of his children through their senses; and I trust this school of science and art which we have met this day to inaugurate will become a temple where young men and others shall inquire after truth, whose victories in coming years, more glorious than those of war, shall be celebrated—a temple where some may win a name that nations shall pronounce with reverence and where that law of progress, which is the blessing of God upon

humanity, shall receive from time to time a new impulse and new development. (Loud applause and cheers.)

ENGINEERING OPINIONS.

The *London Engineer*, in a recent article on new improvements, says:—

"It is instructive to look upon the number of mechanical and engineering applications now in the thrift of successful practice, but which, but a very few years ago, were unknown, and, still more recently, disbelieved.

"How reasonable it appeared to many, at one time—less than twenty years ago—that plate iron bridges would crumple up like pasteboard or leather. Possibly there may be those, here and there, who remain still unconvinced, just as there are those who still refuse to believe in the strength and staunchness of iron ships. How many engineers there were who could not admit that cylinder foundations could be got in by simple atmospheric pressure; and there were others recently, who doubted that a disc pile could ever reach a strong footing in sand by pumping a stream of water through it and out at the bottom. How confidently, too, do engineers now employ concrete in numberless situations were once only stone and deep piling would have been considered secure."

"The changes which have been brought about, within the past few years, in the manufacture and working of iron and steel, are something almost incredible. It would have been reckoned sheer folly had engineers, even ten years ago, counted upon the general introduction of steel for railway axles and tyres; and steel rails were hardly known even three years ago. Krupp's immense ingots were, perhaps, amongst the greatest wonders of the International Exhibition—at least to minds capable of comprehending them; but it is likely that Bessemer's grand discovery—already brought by untiring energy and ready ingenuity to the rank of a large and rapidly growing manufacture, will work the greatest change in our applications of iron. Opinion has already been turned by it from unbelief into a confidence surer than any admiration however great. Even in iron-making by other processes, including the ordinary course of puddling, re-heating, and rolling, the progress in respect of the magnitude of the pieces wrought has been very great. It would have been seriously doubted, five or six years ago, whether armour plates a foot thick, and weighing each 20 tons, could ever be made. McHaffie's malleable castings up to two or three tons weight represent a great step also beyond anything known two or three years ago. This branch of manufacture has been greatly promoted by the improvement in crucibles, those of plumbago now withstanding sometimes a week's work in malleable iron making, and from sixty to ninety rounds in other casting where one or two, or three, was once thought very fair. Another extraordinary stride in metal working is that of drawing steel tubes from ingots in the cold state, by hydraulic pressure. We know more than one engineer who, until he had actually seen this done, refused to believe that it was even