

## VALUE OF EDUCATION IN ART AND SCIENCE.

In England it has been computed that \$125 represents the cost of a highly skilled over an unskilled workman; and that this cost of a skilled workman is less than one year's purchase of his increased value to the nation.

A single fact will illustrate the value of skilled labor in producing the best machinery. A Pittsburg cotton manufacturing company wanted a new Corliss steam engine to take the place of one they then had. The offer of one for \$8,500 was refused. A second offer, for the fuel saved in five years by the use of the new engine, disclosed the fact that the saving would be \$200 per month or \$12,000 in five years. The engine was taken at the first offer. The saving from machinery running evenly, avoiding the breaking of threads, was probably equal to the saving of fuel.

Time will not permit us to do more than to allude to the vast losses arising from ignorance and incompetent workmen, engineers, architects, overseers, or owners of property. The abandoning on the ocean of the French steamship *L'Amerique* through the ignorance of the engineer; the building by our own government, at a cost of \$11,000,000, of twenty light draft monitors, not large enough to carry the turrets for which they were intended; the placing of an engine at the cost of nearly \$800,000, on one of our government ships, which was abandoned after a single voyage to San Domingo, in which the lives of many illustrious men were endangered; the Pemberton mills disaster, in which of the 750 employees 88 were killed, and many disabled for life; the recent Mill River disaster, costing 150 lives and \$2,000,000; the falling of a floor in a Syracuse church, killing instantly 14, and injuring 100 more; these losses are familiar to all. Large sums and many lives are lost by incompetent railroad engineers and architects. Soils are exhausted, and small crops are gathered, through ignorance of the chemical and mechanical principles involved in agriculture. We are now taking nearly \$600,000,000 in value from the elements of our soil, and it has been said that we have taken more in value than the entire

wealth of the country. Agriculture is fast becoming chemistry, and husbandry, machinery.

The Primary School should give a knowledge of objects, their forms and colors and uses. In doing this drawing will be found highly useful, and it will prove an agreeable change from studies less interesting. It is, too, the foundation of technical education, and is important to all of every trade and profession. By training the eye to keenness, and the hand to accuracy and rapidity, it will prove a valuable aid to penmanship, orthography and reading, in all of which observation is necessary. In its higher forms, geometric, model, mechanical and agricultural, it should be continued through the higher schools and colleges. It is not mere picture drawing of which I speak, but something higher and more useful. As a result of this study, we shall have better artists, engineers, mechanics, architects, and designers. Many articles, such as glass-pottery, cabinet furniture, prints, and other manufactures, may be rendered worthless, or have their value increased manyfold according to their designs. Good designs increase the value of prints from 20 to 30 per cent. So important is this art of designing considered now, that a firm in New York pays a designer in shoes \$5,000 a year. By the beauty of his designs a manufacturer of silverware in Taunton, Mass., drove every other manufacturer out of the market. A single manufacturing company in Massachusetts stated that their designs cost them \$40,000 annually, every dollar of which went to England, France and Germany. This sum should be saved to our own country.

Workmen do not sufficiently understand the importance of drawing. It is said that if this art were understood by every journeyman in a machine shop, the productive efficiency would be increased 33 per cent. By enabling workmen to work from a design instead of expensive models, this art would save a vast amount of time and money. A manager of an important branch of industry at Worcester, Massachusetts, says that, when a lad, he was one of a class