

who has never received any sort of scientific education. This neglect perhaps proceeds from the entire ignorance that the whole of the principles of geometry and mechanics can be learned in a carpenter's shop, with pieces of wood, nails, and string, in a manner in which they can never be acquired in the class-room.

Not for a moment is it intended here to deprecate the use of high mathematics, but the principle of virtual velocities, or the conservation of energy, is not half so vivid and real to a boy who has never gone beyond paper-work as it is to one who has been allowed to construct a wooden scale-beam, or been permitted to handle even a home-made gyroscope. Little children have nearly solved the question for themselves by refusing to learn except through the eye and hand; and for them the kindergarten system, when properly used, serves as a method of experimental education. Our Board schools have very properly been framed after the model of our best public schools, and will therefore probably have to follow in their wake. For, if some sort of experiment has been found beneficial in the case of those who are to follow learned professions, how much more valuable must it be to the artisan! Moreover, other influences are at work, making the need of it still more imperative. Up to the present century industries were secrets, they were the property of cliques and classes, they were mostly carried on on a small scale, and the workmen, as well as the industries, were localised in centres, often fixed for them by political considerations, but from which it was very difficult to move. But printing has almost destroyed the secrets of industries; the growth of ideas is destroying trade corporations and privileges; the invention of machinery has diminished small factories; and the railway, while it has increased the localisation of various trades, has enabled the population of artisans to flow freely from one place to another. And thus, in less than a century the whole industrial system of the country has been revolutionised and reconstructed.

This reconstruction has its good and bad sides. Manufactured articles of all kinds are incredibly cheaper than they used to be (regard being had to the change in value of the money-standard). Moreover, there is, for all who choose, far greater chance to enter the class of skilled artisans. But, on the other hand, the mechanic is kept week after week and year after year at the same monotonous employment; and specialisation of labour pushed over-far tends to the degradation of the workman and the diminution of the art-value of his work. This evil produces the result that, although the entry into any trade is more easily open to a mechanic, yet education in his craft becomes more and more difficult, and it becomes more and more hard for him to "rise from the ranks;" and in all trades in which individual skill, adaptability, and thought are required, complaints are increasing that the skilled workman will soon disappear. Under the old system, apprenticeship was the only road to learn a trade. A picture of it has been preserved to us by the pencil of Hogarth. The apprentice paid a fee for instruction, and received his board and lodging as an equivalent for his work. If idle, his master corrected him; if he ran away his chance of employment elsewhere was very small. The master who took an apprentice often gained a friend, a future partner, and perhaps a son-in-law. There was then every inducement for a master to teach his apprentice, and accordingly apprentices were carefully instructed. There were abundant numbers of good artificers in proportion to the demand for their work. The old watches of one hundred years ago show such exquisite taste and skill in the mere embellishment of the interior that the balance-spring covers were models of art-engraving. Thousands of those old watches have been recently broken up in order to turn these covers into ladies' necklaces, the brass being covered with a thick coat of electro-gilding, a fact which reflects anything but credit upon the state of the jeweller's art at present.

The apprenticeship system is now on the decline. This is due to three causes. In the first place, the apprentice rarely boards with his master—the factory system has rendered that impossible—and increased means of locomotion have raised the number of apprentices who live with their parents. In the next place, society is now so large, and trades are so scattered, that an apprentice can easily run away from one master and enter the service of another; so that it is hardly worth while for a master to expend pains in teaching him his trade. Moreover, the factory system creates a demand for half-educated lads, and, by offering wages which appear high to boys of eighteen, induces them to leave their masters just when they are learning most, and on the way to become accomplished masters of their craft. The result is, that formal indentures are now becoming rarer, and boys generally commence to learn a business by entering a shop at 5s. a week, which is an insufficient equivalent for the board and lodging that was once afforded them. There are other causes which also operate in the same direction. In the factory no provision is made for teaching; the master chiefly desires human machines. If he develops skill in a boy he will soon be met with a demand for higher wages, or a threat to leave and carry away some of the secrets of the workshop. It is therefore rarely the interest of masters to do much towards teaching apprentices. On the other hand, the men have a direct interest in doing still less; for each apprentice, when taught, becomes a rival, whose competition aids in lowering wages. Therefore we find that trades unions and societies, so far from facilitating the teaching of apprentices, frequently try and limit their numbers. The sole idea of parents is too often to get the boy to bring home as much money as he can to help the household, and consequently, when the question arises whether he shall go on at a low wage in the place where he is really learning, or leave it in order to obtain a higher wage at a place where his instruction will no longer be progressive, every home-influence is exerted to induce him to take the latter course, to the ruin of his career as a skilled artisan. And, lastly, the boy himself has rarely, at the age of nineteen or twenty, sufficient judgment to resist the alluring prospect of earning £1 or £1 5s. a week, and being enabled to marry and have a home of his own.

It is easier to point out these difficulties than to see how they are to be remedied. In part, no doubt, they will remedy themselves; for every year the industries of Great Britain take a more artistic direction. But true artistic work can never be done by machinery. The greater part of the subtle charm which an artistic object presents is the impress of the mind of the artist. This