difficulty of understanding rules which depended on preceding ones to demonstrate, and which he had never been taught; and this desire to push on a boy before he is thoroughly grounded in the rudiments of education, a feeling often felt by both master and parents, is most detrimental to the acquirement of knowledge.

The common school elementary public education, which comprised a knowledge of reading, writing and arithmetic, is not sufficient for the masses in the present day, whatever it may have been thirty years ago. The common occupations of life have so increased, and the conditions of it have so changed within that period, and science and mechanics have made such startling and rapid advances, that progressive education is absolutely necessary if we would hold our own in the competition and rivalry for excellence that is going on in the world. Not many years ago manufactures in this country, and even in the United States, were hardly known. The housewife did the spinning and the weaving; and we can remember, in our own day, when the itinerant shoemaker went on his annual round. The representatives of many vast machine shops and foundries on this continent were but cross-roads' smithies, and the draughtsman and architect had scarcely then made their appearance. The cultivation of the soil in those days was done nearly altogether by mere muscular strength, and the products of the mechanics—such as the shoemaker, blacksmith, fitter, waggon-maker and carpenter—could boast only of rough strength and durability. There were no workers of skill and taste then displayed, and a simple education was enough to qualify for ordinary avocations. But not so in the present day: although the progress of education in our public schools has made even wonderful progress of late, still it has not advanced in ratio with the requirements of the times. Every year now muscle counts for less, and intelligence and skill for more. The few small and rude manufactures of the past have grown to vast dimensions, and the whole character of construction has become changed. In the cultivation of the soil, intelligence takes the place of muscle and brute force, and scientific knowledge and mental discipline, acquired by the proper study of science, become more essential to success in manufactured articles of every description; and the attainment of success has been rendered more difficult by the novel machinery employed, by the adoption of more delicate scientific processes and by the growing taste of the people.

As the result of new discoveries in science, and of new inventions and industry, occupations have so greatly increased that even the products of the earth have become more diversified, and manufactures so multiplied in variety, as well as in extent, that they give employment to one-fourth of the population of the whole country; and, therefore, to make a country equally progressive with those around her, there must be an ever-growing demand for more technical knowledge, for greater deftness of hand, and for finer taste on the part of the producer.

The effect of the great improvement in machinery has been to elevate the character and increase the field of the workmen, and with the possession of knowledge, taste has become enlarged. It has been urged by some that the excellency arrived at in the construction of machinery has so reduced the number of operatives heretofore required as to act materially to their disadvantage. This is a very mistaken idea. The number of operatives in this country alone has increased to a very great extent during the last decade, and in the United States much greater in proportion to their population. It was the extraordinary demand made upon manufacturers and tillers of the soil during the civil war in the States that gave an abnormal impetus to manufactures and agricultural labor-saving implements, far beyond the average requirements of a steadily growing country, and the mistake rested with those young men who were tempted from the home of their fathers and from cultivating the soil, which was their hereditary avocation, to following handicrafts in cities and at a time of unusual requirements. Had they, after the demand for labour had ceased, again taken up the plough, they would now have been producers and buyers in place of being a drag upon the community.

For this state of affairs many of our manufacturers are themselves to blame for encouraging an inferior class of workmen, because they worked cheap—and who would have been better off by tilling the soil—and not encouraging sufficiently skilled mechanics. Such men, from the want of education and knowledge, can have neither taste, skill nor ambition, and thus a vast quantity of inferior goods is manufactured for our home market which ill contrasts with similar goods of other countries.

But although mechanics are now suffering from the depression of business, and the over-manufacturing of goods beyond the requirements of the country, it must be observed that the field for the exercise of taste, and the demand for its products, are practically unlimited. If hitherto the great object has been to increase the quantity of our manufactures, in future we must strive to improve their quality and thus raise their commercial value. In this work our only reliance must be upon the æsthetic taste which can lend a charm to every object produced by man, and which, fortunately, is the result of education.

The subject of "More Technical Education," we consider, is of such importance that we shall continue it in the next number of the MAGAZINE.

A Really Indelible Ink.—The ordinary so-called "indelible" inks are prepared from salts of silver, and the writing done with them can be removed by soaking the linen with a solution of cyanide of potassium (exceedingly poisonous, it should be remembered) or of hyposulphite of soda, or by moistening with a solution of bichloride of copper and then washing with aqua ammonia. A really indelible ink, that is, one that cannot be removed by chemical agents, may be made from aniline dyes according to to the following recipe:—

Dissolve 8½ grs. of bi-chloride of copper in 80 grs. of distilled water, then add 10 grs. of common salt and 9½ grs. of aqua ammonia. A separate solution is made of 30 grs. of hydrochlorate of aniline in 20 grs of distilled water, which is then added to 20 grs. of a solution of gum-arabic, containing 2 parts of water, 1 part of gum-arabic, and lastly 10 grs. of glycerine. Four parts of the aniline solution thus prepared are mixed with part of the copper solution.

The fluid thus prepared has a greenish color, but becomes black in a few days after being used for marking, or at once by the application of a hot iron or on being otherwise heated. A steel pen may be used for writing with it. If the cloth after being marked is put into tepid soap-suds, the writing acquires a fine bluish tint.

The ink should be perfectly limpid, so as to penetrate the fabric; and the solutions should be mixed only when they are to be used.—*Boston Journal of Chemistry*, xii, 76.