ELEGANCE OF DESIGN AN ELEMENT OF UTILITY IN MACHINERY.

There are many who declaim against anything that seems to them of "no particular use," and whose narrow and sordid views blind them to the value of beautiful objects, valuable simply because they are beautiful, but to such it is not our intention to address ourselves. It is foreign to our present purpose to attempt a demonstration of the æsthetical needs of the human intellect, or to show that their proper gratification is necessary to the mental and moral health of mankind. To an intelligent and thoughtful student of mental and moral science, we should as readily attempt to prove that the body needs to be nourished and warmed, and rested when weary. But there is another class still, who admitting the necessity of a cultivation of a taste for the beautiful, yet fail to appreciate the advantages which result from the combination of the beautiful with the useful. That an artist should spend weeks in perfecting a landscape painting, or that a carpet manufacturer should pay large sums for designs, in order to improve his wares, seems to them perfectly reasonable; but that a hoe, or an ax, or a plow, should be made a subject for tasteful decoration, is in their opinion an absurdity. The piano should have carved legs, but the cooking stove—why should that be ornamented? We propose in the present article to notice briefly the benefits to be derived from a proper attention to the combination of the beautiful with the useful, and also to show that in judicious attempts to make this combination, the highest degree of usefulness in construction will be most likely to be obtained.

The most important advantage to be found in the union of beauty with utility is the increased dignity it confers upon labor. In this both the manufacturer and the one destined to use the product of his skill share alike. The first feels himself elevated, and he is elevated, in the effort to beautify his production; the second is also elevated by the use of the more elegant and shapely implement, and is stimulated to attempt more excellent work on his own part, and this attempt dignifies and sweetens his toil. Who doubts that were fifty girls employed in an establishment with fifty others, one fifty to be supplied with nicely ornamented sewing machines, placed in a tidy and handsome apartment, the other fifty to be supplied with machines of the plainest patterns, situated in a rude and uncleanly room, who doubts that a feeling of superiority on the one hand, and of inferiority on the other, would soon spring up? And who that has any knowledge of human nature but could predict with certainty in which of the two apartments would more and better work be accomplished. Nor would the superiority or inferiority be imaginary, it would be real, and in each case progressive. As long as the causes which produced it should be permitted to exist, the difference between the two classes of operatives and in the quality of their work would increase, within certain limits, until the divergence would reach its maximum point in refinement of the one, and the degradation of the other class. Similar causes have produced the different gradations of modern society, and the history of the world shows that in the gradual transition of the human race from a state of barbarism to one of enlightened refinement, the increased taste for the beautiful combined with the useful, is a sure index of the degree of advancement, attained to at any period in the existence of a nation.

A new mill was to be erected in a large manufacturing town a few years since. The superintendent of the works with the sanction of the company who employed him expended large sums of money in the adornment of the grounds and in architectural display. But in the room usually styled the "weave shop," he was especially lavish. Beautiful mirrors of large size in fine gilt frames with marble wash basins and spacious wardrobes were placed at one end of the room. The gears were boxed in with mahogany, and nothing apparently was omitted which could add to the comfort of the operatives or to the general appearance of the room. His shrewdness and knowledge of human nature were rewarded when (as he quaintly remarked to us once in a conversation upon the subject), "he had skimmed the cream of the help in the entire town, and not another establishment could get them away from him."

A steam engine nicely ornamented and tastily designed, will be found nine times out of ten to wear longer, and to be kept in order with less expense, than one made in the cheapest and plainest style. Better care will be taken of it, because the pride of the engineer will be enlisted to render him vigilant and careful. The same is true of all machinery, and when an operative can be made to take a pride in his machine and in his work, there is little fear that his duty will be neglected.

We have thus attempted to show that judicious ornamentation in the construction of machinery is an element of utility on account of the effect produced upon the workman who is destined to operate it; and we think it will not be difficult to show that the same cause generally results in the production of a better machine than would be produced if a proper consideration of taste in construction were entirely neglected. To do this, only a brief consideration of the nature of the beautiful, and a very partial analysis and examination of its elements will be found necessary.

One of the most important of all the complex ideas and emotions which constitute a sense of beauty, is the full appreciation of the perfect adaptation of an object for the place it is to occupy or the purpose it is designed to subserve. In other words a sense of fitness is a part of the feeling excited in us by the sight of beautiful objects. Many things which at first sight are repugnant to our conceptions of beauty, become beautiful as soon as the sense of their adaptation to some definite purpose is felt. A striking illustration of this truth occurred to us while passing through the machinery department of the World's Fair, as it was called, held in New York in 1853, in company with a friend whose inventions have since made his name familiar to every mechanic in the country. We paused before what seemed to be a huge mass of cast iron, certainly not purposeless, but seemingly without proportion, and to an ordinary observer an unsightly and exceedingly unattractive object. Upon inquiry we found that it was a part of a powerful cutting engine, destined to be used in cutting the teeth of huge gears in one of the largest marine engine manufactories in America. Imagination at once supplied the remaining details, reversed the position of the enormous casting, attached to it the ponderous pulleys and fly wheel, and perceiving the design of every bulky projection forced from us a simultaneous exclamation of admiration. In this instance what was at first apparently rude in substance and uncouth in shape, become interesting through a knowledge of its ultimate purpose; beautiful in the strength and grandeur of its massive and just proportions. So in nature, rude masses of rugged and to the casual observer unsightly rocks, are to the artist, features of beauty in landscape, to the geologist, sublime chapters in the history of the universe. So much this truth impresses itself even upon those who are most utilitarian in their views, that they are in practical life, unconsciously influenced by it. In purchases, one of this class would, all things else being equal, incline to the most beautiful article in a collection of goods, not because they were sensible that it was more beautiful than others, but because in their minds the superior comeliness would produce the impression of superior quality. Those manufacturers who have recognized this mental peculiarity have outstripped and will continue to outstrip less wise competitors.

Conceive a wheel with the large ends of the spokes attached to the rim, and the small ends to the hub; or the connecting rod of a locomotive of equal size throughout, or smallest in the middle. Now fancy a man who had never seen these things, but who had in some way acquired a fine taste for beautiful forms, setting to work with the sole view of improving their appearance. Would he not be likely to hit upon such forms as would not only add greatly to their beauty, but also to their strength, most probably without taking anything into consideration except the idea with which he commenced his task, he would finally reach and retain the forms at present used for those objects. For in such things the appearance of strength can only accompany real strength, and in them strength is an element of fitness, and fitness, we have already seen, is an element of beauty. In machinery it may perhaps be as truly said that "beauty is strength" as that "strength is beauty."

Especially should attention be paid to the appearance of machines which are new claimants for public favor. The successful introduction of a new invention depends more upon this than is usually imagined. Many a worthless invention has realized something for its inventor because it looked as though it was valuable, while many a good and useful invention has been neglected because its appearance and finish were not such as would readily attract attention and inspire confidence. Would all inventors realize the value of the advice we give them, we should hear of fewer disappointed hopes and of more frequent successes.

Case-hardening Iron.

Thomas Sheehan, of Dunkirk, N. Y., has patented the following:—

"In a suitable cast iron box put a layer of broken limestone, two inches thick. Over the said layer place a perforated plate. On the plate I next put a layer, of about two inches in thickness, of a mixture made as follows:—200 parts charcoal, saturated with water; 30 pounds of muriate of soda; 12 parts of sal-soda, pulverized; 5 parts of rosin pulverized; and 5 parts of black oxide of manganese. The ingredients thus specified well mixed. I now take the iron intended to be steelified, and put it on the top of said mixture. Another layer of the mixture is now put on the iron, and alternate layers of iron and mixture supplied until the box is filled, always finishing with a heavy layer of the mixture. Care must be taken to prevent the iron designated to be hardened from coming in contact with the iron box. Lute the cover of the box with a mixture of yellow clay and sand, with a little salt in it to keep it from cracking. The box will now be put in an open furnace, suitable for the purpose, and a fire made of hard coal and wood, and keep the box subject to strong heat from two to seven hours, according to the size of the box and the bulk of iron. As the heat increases, the carbon will be expelled from the limestone in the bottom of the box, and will unite with the oxygen and carbonaceous ingredients of the charcoal compound as aforesaid, and will convert the iron in the box into steel on its entire surface. I then take said iron out of the box when it is of a bright cherry red, and chill it quickly in a large vessel of cold, clear water. The surface of the steelified iron will now be smooth, and free from scales."

Improvement in Fire-proof Safes.

Patented by Edward H. Ashcroft, of Lynn, Mass. "I place in the inner perforated compartments of a safe, metallic tubes or vials filled with a liquid acid, (sulphuric acid, for instance,) one or both ends of such tube or vial being stopped with an easily fusible alloy. I surround this, and place in immediate contact with it, bicarbonate of soda. I then put into the compartments a large proportion of carbonate of ammonia, or other volatile salts.

"When the safe becomes heated to about 212° F., the above mentioned fusible alloy melts, thus opening the vial; the acid runs out, and, coming in contact with the surrounding bicarbonate of soda, immediately eliminates carbonic acid gas, which fills the safe and is non-combustible. The evolution of this gas having ceased, if the safe is still longer heated, the carbonate of ammonia or other volatile salt vaporizes slowly, and, being also non-combustible, protects the contents of the safe."

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Correspondence of the Sun with the Clocks.—Sidereal Time.

MESSRS. EDITORS:—Allow me to add a few words in further explanation of one of my former articles on this subject, and at the same time to correct a statement made. The best way in which the mean time is obtained every day of the year is by the sidereal days, which consist in the time of apparent revolution of the stars around our earth, and are always perfectly uniform (unlike the solar days); therefore the sidereal days have always the same length, consequently the time obtained by a clock regulated to sidereal time corresponds always with the motion of the fixed stars, without any deviation, except by the aberration of light, as I explained elsewhere in this paper. As now the stars revolve nearly 366¼ times in a year, and the sun 365¼ times, the siderial day is 366¼ part shorter than the solar day, which makes three minutes and 56 seconds nearly, for each day. The passage of a star in Aries through the meridian, has been adopted as the beginning of every sidereal day, and its passage on the 21st of March as the beginning of the sidereal year; as now on that day the sun occupies that very same part of the heavens and therefore passes also the meridian at the same time, it causes the solar and sidereal time to coincide; we have, then, to add 3' 56" nearly at 12 M. for every day afterward in order to find the mean midday of the solar day. In this way, in an astronomical observatory the solar time may be found for any moment, by means of a clock giving sidereal time, which clock in its turn may be regulated every night by observations on the stars.

The chief cause now that the solar time, directly proved by the sun's shadow, does not correspond with the mean solar time calculated from sidereal time, and also given by a well regulated clock, is (as I stated) the irregular yearly motion of the earth in its varying distance from the sun, and also the inclination of the earth on its axis has an influence in this phenomenon, which, however cannot be well explained without geometrical figures. This statement may serve as a correction for an expression inadvertently made in the beginning of my former article. V.

New York City.

Storm Theories.

MESSRS. EDITORS:—The theory of Doré, Reid, and others, is what is called the cyclonic theory, in which it is maintained that the storm revolves about an axis, while it is moving over the surface of the earth. The progressive movement of the center of disturbance varies from fifteen to forty miles per hour; while the velocity of the wind around the center is sometimes eighty, ninety, or one hundred miles per hour. The area over which storms extend is seldom less than six hundred miles in diameter, and is frequently much larger, often covering many States. From the examination of some hundreds of storms, in Europe, their form was found to be circular; while in this country they are often more elongated, and their outline sometimes irregular. There is, however, no theory yet discovered that will satisfactorily account for all the facts in the case. Very much remains to be done before all the laws which govern the disturbances of the atmosphere, and its attendant phenomena, will be accurately ascertained.

The prediction of these violent commotions has been a great desideratum from time immemorial; not only to the sailor, but to the farmer, and to all classes of society. Scores of lives and a vast amount of property are lost every year by storms, a large part of which might be saved if the approach of danger could be known a few hours before its arrival. Notwithstanding all the signs and astrological predictions which have been more or less current among mankind, very little has yet been done toward furnishing the world with any safe and reliable means by which they may know when to expect storms long enough before hand to give time for preparation. The interest which has been taken in meteorological observation and the benefits resulting from it are encouraging, and sufficient to point out the direction in which we are to labor if we ever succeed in predicting the approach of storms. After the loss of 60,000 lives and the damage done to the shipping in Calcutta by the storm in October, 1864, the British government established a system of telegraphic meteorological predictions in India, similar to that which was established in this country by the Smithsonian Institution in 1856.

"The information conveyed by telegraphic dispatches in regard to the weather was daily exhibited by means of differently colored tokens on a map of the United States, so as to show at one view the meteorological condition of the atmosphere over the whole country. At the same time publications of telegraphic dispatches were made in the newspapers." [Smithsonian Report, 1865.] It is to be regretted that this system, which was discontinued during the war, has never, to my knowledge, been fully re-established. A committee appointed to consider certain questions relating to the meteorological department of the Board of Trade in England, recommends the appropriation of £10,450 or $52,250 for the successful carrying out of this system. I am glad to learn that this Board of Trade has just established five observa-