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USEFUL IMPROVEMENTS NOT OPPOSED TO THE HARMONY OF NATURE.

That so-called romantic but morbid taste which assumes to itself a peculiar refinement, manifested by sneers at the utilitarian, and talks of desecration when man's ingenuity and needs compel the forces of nature to pay him tribute, is unworthy the thoughtful and judicious mind.

The roaring waterfall, the flowing river, the restless sea, only half subserve the purposes of their creation, when they appeal alone to the eye and exact our admiration or wonder. The useful is intended to be mingled with the beautiful. The two are in absolute and perfect harmony. Whatever in nature appeals to our sense of beauty is useful, at least indirectly, in educating the mind and refining the tastes.

Nature unadorned is not its highest type of beauty. The rocky and barren mountain may excite our wonder, the apparently unbounded plain and the impenetrable forest may arouse our surprise and anxiety but none of them are pleasingly beautiful. We look upon them perhaps as necessary adjuncts to the great plan of nature, but not as contributing directly to human uses. He who has sailed for days and nights over the ocean without meeting a sail, knows the sense of desolation which comes over him as he is forced to believe he is alone. Contrastshighen our enjoyment. A scene of wildness appeals more powerfully to the senses when it is relieved by the sight of a monument of man's ingenuity in a magnificent bridge or centipedal aqueduct. An addition to our enjoyment is afforded when we know that these works assist in the progress of the race. All well-balanced minds look upon every step of progress in mechanical improvement as a means of adding to human happiness, and therefore do not feel a regret because the original wildness of nature is intruded upon by the works of man's ingenuity. Man is the improver of visible nature as well as of the latent forces of natural laws. Nature exists for man. It is for him to study her laws and find the means of executing them. She is the Sphinx whose riddles the inventor will unravel. His improvements are in no wise the antagonists of the beauty and the harmony of nature's laws, uninterfered with by the daring attempts of her latest child. The employment of a waterfall for driving machinery, although

it may detract from the original beauty of the fall, does not necessarily disturb the harmony of nature. Utility is not opposed to beauty. Without the mechanical ingenuity of man, the face of nature would be in a measure a waste; for where there is no benefit to man, the purposes of the creator are but half fulfilled.

We prefer to see the raging torrent bridged, the obdurate and impassable mountain tunneled, the valley cultivated, the stream utilized by being compelled to contribute to man's wants, by dams and machinery, and the forest made to yield before his improving footsteps, rather than to view them in all their native wildness and savagery. Man, and not the unaided forces of nature, is the civilizer. The aborigines of this continent held it from time immemorial, but existing as savages, they never improved upon the generation that preceded them. To day, after only two hundred years occupancy, the improving race has multiplied to forty millions, living pleasantly and comfortably, on the soil which gave a meager and miserable support to less than five millions of naked savages, gorged in times of plenty, and who starved and died by thousands in times of scarcity.

He who travels five hundred miles over our railroads, spanning half a continent, and at each mile in his progress sees prosperous villages where but a few years ago was an uninhabited wilderness, who visits prosperous towns or populous cities where but a decennary before was an agricultural hamlet, knows that the improvements of inventors and mechanics add to the beauty of the landscape, as well as contribute to the advancement of the race, and he will not be inclined to believe that the improvements of mechanical and engineering science really infringe upon the domain of the natural.

The truth is, in a nutshell, that the "mission" of this generation at least, is that of improving—of pushing forward the march of the human race—and it will not do for us to attend to the obsolete and effete ideas of the generations which preceded us, nor to accept the notions of those who would see in the practical Yankee and Anglo-Saxon opinions, an element that would destroy all poetry, romance, and sentiment. For ourselves, we do not despair of seeing the poetry of steam, the romance of steamship voyages, and the sentiment of a sewing machine yet embodied in poetry and story.

THE TOY BUSINESS IN THIS COUNTRY.

The manufacture of toys and "playthings," until within a few years, has been almost wholly confined to Europe. The Germans and Swiss have furnished the rising generation with the most of these necessary adjuncts to the pleasures of childhood. But lately the facilities of the Patent Office have stimulated production in this direction, and now our most amusing toys are those of American manufacture. And it is a profitable direction for inventive genius.

Everybody has seen the comical dancing Ethiopian, cruelly impaled upon a wire, and forced to respond, with every joint in his supple body, to the rattle of the fingers on his pivoted platform. This ridiculous device, being patented, has brought its proprietor a fortune. Then there is the crowing cock, his intestines a tin whistle, able to excite the envy of the monarch of the barnyard by his clear, shrill, and natural challenge. This, also, is a paying investment. The Dervishes and Zouaves, fantastically dressed, suspended by an elastic cord, perform feats of leaping which put to shame the Buislays and Hanlons. On the same principle is the return ball, which, like the Australian boomerang, comes back to the hand that projected it. A top of thin metal, hollow, and gayly lacquered, when started by means of the coiled spring in the handle, will continue its revolutions for ten minutes at a stretch. The flying top is a good illustration of the propeller screw. Released from the shaft on which it is made to revolve, it flies whirling at an angle through the air until its momentum is lost, when back it comes, returning to the operator for a new start. We saw the other day a whistle, a mere gland of kid or thin leather, of a crescent form, holding, stretched between the two horns, a thin membrane, by the vibrations of which, aided by the operator's tongue, a great variety of sounds could be produced. The grunt and squeal of the pig, the warbling of the canary, the whistle

of the quail, the piping of the curlew, and many other calls of animated nature, can be perfectly reproduced. This is a useful implement for the sportsman, and affords unlimited delight to incipient manhood.

Almost all these can be used as illustrations of natural laws. Philosophy may yet be taught in our schools by toys. The wonderful resemblance to life of our American toys in many instances, makes a broad distinction between them and those heretofore furnished from Europe. These last are usually caricatures, and are misleading to the young mind, which receives ideas through objects and not through words mainly. Take our rubber toys. Some of them are worthy to rank with the productions of the artist. They are marvels of beauty and natural expression. The dolls made here of this material do not wear that appearance of corpse-like waxiness, or inanity, which the traditional doll from time immemorial has borne. They are pleasing to look at and wonderful in endurance. Some by hidden machinery can walk, others cry and move their eyes, but none are hideous and repulsive in expression.

This toy business may be considered by some as unworthy of notice by scientific journalists; but as we are more or less educated by our surroundings, and as the toys of the child are a prolific source of ideas which will cling to him through life, it is important that they do not convey false impressions. These improvements in our children's playthings are additional helps toward their education, and while their projectors realize fortunes from their introduction, young humanity and the world at large are pleased and benefited.

THICKNESS OF BOILER PLATES.

In No. 2, current volume of the SCIENTIFIC AMERICAN, we stated, in reply to a correspondent, whose boiler of five feet diameter and sixteen feet long, failed under a pressure of sixty pounds, that the plates of the boiler—five-sixteenths of an inch—were too thin, and quoted Bourne and Fairbairn as our authority, who give three-eighths as the proper thickness for a boiler of those dimensions.

A correspondent writing from Santa Clara county, California, says he has in his mill one of precisely the same size, which he has used for seven years, carrying sixty-five pounds steadily, and that it has never leaked nor strained. It is made of Lowmoor iron, five-sixteenths of an inch thick. Another, which is in his propeller boat, of the same dimensions, made of Pennsylvania iron, five-sixteenths thick, has been running eighteen months, carrying from sixty to seventy pounds of steam, and is certified by the United States Inspector to be able to bear a pressure of ninety pounds. The writer attributes the failure of the boiler mentioned to having too much fire surface and too little steam room, so that not enough of solid or undisturbed water could be kept over the crown sheets to keep them from heating. The steam space being contracted, the suction of the engine probably kept the water in a foam. His boilers, our California correspondent states, have eight-inch water space between the bottom and the lower row of tubes, which are placed in regular rows up and across the boiler, leaving two inches of space between the tubes across the boiler and one inch vertically. Steam drums two feet diameter traverse the whole length of the boiler, connecting with the top at each end with cast-iron pipes. The boilers contain, respectively, one thousand and one hundred and eighty feet of fire surface.

In the case of the defective boiler we think no facts in regard to the steam room were furnished us. It certainly is an important matter that sufficient steam space is given, and that a sufficient depth of water should be maintained over the fire box to preserve the crown sheets from undue heating and consequent weakening. The Lowmoor and Pennsylvania charcoal iron are undoubtedly unrivaled for tenacity, but still we are of the opinion it is better in the manufacture of boilers to err on the safe side. It would be hardly wise to recommend five-sixteenths of an inch as a safe and proper thickness for boilers sixty inches in diameter, however strongly braced, for carrying sixty pounds of steam.

LUCK slips downward to indigence. Labor strides upward and to independence.