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The Sacrifices of Inventors.

A few weeks since, we replied to a contemporary who had disparaged the character of inventors, charging them with imposition, and swindling the public out of an aggregate "annually of millions." Since that period, a circumstance has forcibly brought before our mind, the sacrifices made and the losses sustained by inventors in pursuing their investigations. On a recent visit to the Crystal Palace, in this city, we noticed the large explosive gas engine of Dr. Drake, standing silent and in disarray, a monument of the enthusiasm with which its inventor has pursued the subject for years, losing both time and money. We do not believe it can ever be brought into useful operation, but we do not the less admire the patience with which he has labored to accomplish the object of his day and night dreams.

How few inventions have been struck off by sudden brilliant thoughts! Man is so constituted that he is compelled to constant study and labor, in order to obtain excellence in any science or art; it seems to be part of his nature to find his way to success only through numerous mistakes.

It is a good thing for the world, that we have inventors (we use this term in its widest sense) possessing that spirit of enthusiasm, in pursuing subjects to make discoveries and improvements, which enables them to go on with indomitable courage, under repeated failures, until they have triumphed over innumerable difficulties. Were it not for such men, our advance in civilization would be small indeed. It is only through success that inventors obtain rewards, and the sacrifices which they sustain in endeavors to achieve success, cannot be estimated in dollars and cents.

The public know but little about the numberless experiments which inventors make in working out their conceptions into practice—their very blunders are valuable to the world. Thus, one inventor will investigate a subject and pursue it under many disappointments, and at last fail of entire success; but another hearing of his experiments, becomes excited thereby, and takes up the subject where the former left off; he advances it a few steps further, and gives it up also. A subsequent inventor hearing of his efforts, then takes up the matter where the others left it, examines it carefully, sees the difficulties that baffled his predecessors, removes them, completes the invention, and it goes forth an apostle of civilization. The majority of the most improved and useful machines now in successful operation are the works of several minds, one inventor having added an improvement here and another there, until they stood forth perfect and complete. Patrick Miller, who made early experiments with steamboats in 1759, spent \$150,000, for which he never received a fraction in return; but we have no doubt that at the present day we reap some benefits from his expenditures, as they directed the attention of Fulton, who was then in Europe, to the subject. And how was it with Whitney who gave that most valuable invention—the Cotton Gin—to his country? Garnet Andrews, of Washington, Ga., in a letter to the *Southern Cultivator*, of this month, says:—"I understand from good authority that Whitney died poor. * * * Such men are the true benefactors of mankind. Where is the score of statesmen and warriors, mentioned in the history of Georgia, whose services are to be mentioned in comparison with these mechanics?"

At the present day, there are more opportunities, we are happy to say, for inventors being rewarded, than in days past and gone; nevertheless, many—perhaps the majority of inventors—always keep poor for the benefit of everybody but themselves. No sooner has one of these completed an improvement, than another object presents itself to his mind, requiring improvement also. His energies are aroused, and on he goes making experiments, and spending all the money he

had previously made, in perfecting it. It is thus that invention after invention comes forth from the fertile and enthusiastic minds of inventors, not so much for their own good as the benefit of others.

Vulcanized India Rubber Belting.

It is now about eighteen years since we saw the first samples of india rubber belting as a substitute for leather in driving machinery. They proved to be very inferior, and thus the article was brought into disrepute for such purposes, and those who had tried it, came to the conclusion that "there was nothing like leather" after all.

We venture the statement that one year ago there was not five hundred dollars' worth of india rubber belting in use in the city of New York; but a change has come over the face of things since that time. Within the past ten months, many thousand dollars' worth of improved rubber belting has been put up, and with such success that in some establishments where it has been fairly tested, it is replacing leather belts as fast as the latter are worn out. From information which we have personally collected on the subject, it appears to us that this material is yet destined to effect an economic revolution in driving machinery. In the extensive establishment of Burr & Co., in Cliff street, this city, where the manufacture of hat-bodies is carried on, and where an immense amount of belting is used, it has taken the place of leather on nearly all the work. We instance this case because the machinery in this manufactory is such as to afford a signal test of the quality of belting. One long india rubber belt, eight-ply, and thirty-six inches wide, is employed to transmit the power from a fly-wheel of two horizontal steam engines of 100 horse-power each. Another of the same material, 100 feet long, seven-ply, and eighteen inches wide, transmits power from a pair of engines, each 150 horse-power, to drive the printing presses in the establishment of J. Gray, on Frankfort street. This belt runs out doors, and has been in use for three months. A belt twenty inches wide, for driving intermediate shafting, has been in use for twelve months, and it appears to be nearly as good as new. Performing the same work, a leather belt of the best quality only lasted six months.

The fan-blowers of the "forming machines" at Burr's, and those for teasing and cleansing the fur, are driven at the high velocities of from 3,000 to 3,500 revolutions per minute. This speed wore out the best leather belts faster than those of india rubber which have supplanted them.

India rubber belting has been for some time used for driving the presses on which the *SCIENTIFIC AMERICAN* is printed, and has proved superior in every respect to the leather belts previously employed. It also possesses the qualities of running unaffected under exposure to water, to the open air, and even to a temperature above the boiling point. A five-ply india rubber belt, twelve inches wide, as now manufactured, is considered equal to a double leather belt of the same width. The price of the latter per foot of length is \$2.20, while that of the india rubber is only \$1.04, and so on for different widths in the same ratio.

The new variety of india rubber belting to which we have referred is manufactured by the New York Belting and Packing Company, No. 6 Dey street, this city, at their factory at Newtown, Conn. The cotton duck which gives the peculiarly uniform and non-elastic character to such material is woven specially for this purpose, with the warp much stronger than the filling, and cut by machinery into strips of a perfectly regular width. Single strips of this duck will bear a tensile strain of 125 pounds for each inch of width. These are coated on both sides with the rubber composition under the pressure of heavy calenders, and then laid together and pressed again, to make the thickness required. The manner of laying this material, and to which is due much of the superiority of the modern article, is shown in the accompanying figure, the lower strip being cut of twice the width of the other or others, and the edges folded over, so that they butt together in a line along the middle of the belt. This line is

subsequently covered with a thin strip of rubber, and the whole belt subjected to a very heavy calendering, which effectually welds

the parts. A subsequent vulcanization, or exposure to a high steam heat for six or eight hours removes the liability to be affected by any temperature less than some 250 degrees. The company are manufacturing the belting on a large scale, and guaranteeing each belt in a fair trial for six months.

Locomotive Building.

The locomotive engine has been forcibly termed by some the greatest and most successful effort of mechanical engineering ever yet produced; and whether we look at the difficulties incident to the task, at its great perfection and also its great complexity as now constructed, its immense power in a small compass, the great expense involved in both its construction and maintenance, the overwhelmingly greater aid it has afforded to the productive industry of the world, the social happiness it has augmented, the knowledge it has diffused, or the peace of nations which it has promoted by the increased intercourse of the people; it cannot but be regarded as a machine of most extraordinary importance, and one the development and improvement of which cannot attract too much attention.

We have about 27,000 miles of railroad in the United States, and about 9,000 locomotives thereon; Great Britain has about 8,000 miles of road, with about 3,500 locomotives, each country having an average of one locomotive to about every three miles. France has about 1,500, and all the rest of the world about 1,500 more of these powerful monsters. Although a considerable proportion are always lying up for repairs, or standing idle awaiting their turn to act, the total number which, as we write, are striding furiously but smoothly along on their iron tracks, must approximate to 4,000.

Two leading manufacturers in England have completed each a thousand locomotives. We have no shops in this country so long established, nor counting, we think, so large a number; but Rogers, Ketchum & Grosvenor, at Paterson, N. J., turn out nine each month of very superior machines, even during the present depressed condition of the business; and there are several other builders which turn out each about two per week, or 100 per year; and the improvement, or rather the change in the style of these machines is so rapid and constant, and the various characters of their work, and taste or whims of the parties ordering them, are so variable, that scarcely any ten in the whole world are alike.

From a recent general survey of locomotive building, in *Holly's Railroad Advocate*, it appears that this branch of manufacture is now by no means the best investment of capital and skill in this country. A few years ago, while money was plenty and railroads rapidly extending, the locomotive business was unprecedentedly good, the established shops were crowded, and making money and making locomotives, were almost synonymous terms. As a natural result, there sprang up in the East, the West and the South, a multitude of locomotive shops, including in fact almost every machine builder, whose tools were adapted to the work.

But the increase of railroads was checked by a lack of ease in the money market, by lack of economy in the management of roads and by the reaction of an unduly inflated interest in an enterprise which, like many others, is legitimately of slow development. Hence locomotives were no longer bought in large quantities with cash, but on long credits and with in some cases precarious securities. This kind of pay rendered it difficult for any but houses of ample capital or of established reputation to succeed. Yet a few of the new establishments commenced with a talent and capital which enables them at this day to rank among the first.

A third era has now commenced. The business is again improved, and will pay those who have talent and capital invested; but if the demand and pay for work are greatly increased, of course it may be overdone again.

Our City.

People residing out of New York, unaccustomed to its bustle and excitement, would very naturally conclude, from a perusal of the daily prints for a few weeks past, that its inhabitants are about the greatest set of ruffians in the world. It cannot be seriously disputed that our city government is very corrupt. Things about our various departments are loosely and selfishly managed; and unless those in charge are absolutely opposed to stealing—from pure principle—more or less of the vast streams of money which run through these various city mills, will lodge, on its way down to the receiving till, or be like the gold in the San Francisco Mint, so volatile, that it goes up the chimney in spite of the honest assayer.

Even now, amidst our political convulsions, riots and conflicts between the powers that are and the powers that would still like to be—the great business arteries are unclogged—and the industrious mechanic, the energetic merchant, and the upright citizen, are all moving along, not unconcerned, but actually not disturbed in their business by the broils and battles which seem constantly brewing at or near the City Hall, to the disgrace of our boasted law and order proclivities. Such things make good men ashamed; but it is not necessary, even now, to attempt to vindicate the good name which properly belongs to a large portion of our mercantile and professional citizens. In simple truth, they have no lot or part in this disgraceful state of things. They are at their legitimate business, and the struggle now going on is simply between two rival political parties—brought about by the actual corruptions which are known to exist in the government of this much abused city.

In spite of stagnant pools and decaying vegetables, which exhale their foul odors in some of the lower quarters of the city, the general health of the people is unusually good. Our noble rivers of pure water, washing each side of the Metropolis; our principal streets, clean and well regulated, together with the Croton water and the Rockland Ice, all tend to preserve the proper equilibrium and attract the stranger even at this season to visit our city on a tour of pleasure.

Fair of the American Institute.

The next or twenty-ninth Annual Fair of the above Institute will be held in the Crystal Palace, this city, commencing on the 15th of September next, and continue open until the 28th of October. The building will be opened for the reception of articles from Monday, 7th, till the 15th September, but heavy goods from a distance will now be received, and stored in the Palace until the opening of the exhibition. Fifteen principal railroad and six steamboat companies, have consented to return, free of freight charge, articles from distant places exhibited at the Fair. The managers promise that they will use their best efforts to secure a first-rate exhibition, and are now making preparations for increasing the facilities for operating the machinery. Inventors, mechanics, manufacturers and farmers from all parts of our country are invited to become exhibitors. The managers also promise to the public that practical and disinterested judges will be appointed to examine and report on all articles on exhibition; and, in order that justice may be done, they have resolved that should any exhibitor be dissatisfied with the award, an appeal may be made to the Board of Managers, and should it be entertained, the subject will be referred to the Committee on Manufactures, Science and Arts, who will re-examine the article, and their decision will be final.

Persons desiring to become exhibitors will receive a copy of the rules and regulations, with all required information, by addressing W. B. Leonard, Esq., Corresponding Secretary. We hope that all articles intended for the exhibition will be in full working order, and in place, on the very day the Fair is opened to the public. Not an article should be received after that period.

In the *Repertoire de Pharmacie*, M. Leperdriol advises to conceal the disagreeable taste of cod-liver oil by the addition of about ten per cent. of common salt. Not only does the salt render the oil palatable, but it causes the stomach to digest the oil more completely.