The Orphans' Friend.

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EXTRACTS FROM AN ADDRESS DELIVERED BEFORE THE AMERICAN INSTITUTE OF INSTRUCTION, AT NORTH ADAMS, MASS., BY P. A. CHADBOURNE, LL. D., PRESIDENT OF WILLIAMS COLLEGE, MASS.

It is supposed that education will prevent a waste of labor; that the educated workman in any productive employment will put his blows in the right place and strike them at the right time, so that his labor shall be more efficient for the good of himself and the world than the ill-directed efforts of the ignorant man. To make labor efficient, schools are established for the education of workmen in every industrial pursuit.

It is plain, however, that the world, as a whole, is still far enough from making all labor as productive and effective for good as it ought to be. Through ignorance, carelessness, pride, and dishonesty, a large portion of the labor performed is wasted, in that it fails to produce the desired result or at least adds nothing to the rational enjoyment or progress of the race. We have to observe for a single day to find too abundant illustrations of this subject. A hundred ignorant laborers, working under their own direction, or rather without direction, in any of the great industrial pursuits of the age, would starve if depending upon the products of their own labor, while that same company, directed by an organizing brain, would support themselves in comfort and leave a handsome surplus for their employer. Through the carelessness of servants, property is daily destroyed; through the carelessness of owners and guardians of property, ships are sunk, cities burned, and there is a constant, needless waste of property through rust and decay. All such loss is waste of labor. Pride wastes labor for show and dishonesty wastes labor on poor material or by so cheating in quality of work as to make good material of no account. So we might enumerate a list appalling in magnitude, untill we should feel like joining the crusade to reduce the hours of labor, that men might learn not to waste it, if for no other purpose. If ten hours of labor are not sufficient to enable the able-bodied men and women to support the world, if we could stop the waste through ignorance, carelessness, pride, and dishonesty, eight hours would be better. After allowing for all needless misdirection and waste, we do not believe that we now get more than six efficient hours out of the ten during which men really do toil. It is safe to say that more than one-third of the time and strength of all who labor is spent in vain.

Does this same waste appear in our own work, the work of education, the object of which is to save all waste? In all honesty, we must say yes. Perhaps I might add, there is waste here from the same causes I have already mentioned: ignorance, carelessness, pride, and dishonesty. I might also add that there is waste oftentimes from the necessity of the case. It often happens, in ordinary work, that we have to labor at a disadvantage. The same is true in education.

A portion of this waste from all these causes is due to failure on the part of the teacher, partly it is due to the student, and partly to the parent or guardian. We can only point out the conditions of the waste, and the share belonging to each delinquent will readily appear.

The first source of waste I mention is *imperfect teaching*. I do not so much refer to the defective knowledge imparted in the school-room, although this is often painfully apparent to those who attend examinations, especially in the progressive natural sciences—I do not so much refer to this as to the wretched habits of study formed in some schools. There are schools without system, without any standard of accurate scholarship, and without any enthusiasm; for a genuine enthusiasm for study is impossible under any false system of instruction.

The second point I make is the teaching of *unimportant things*.

Poor text-books come in here for their share of blame. Small text-books, containing only those essentials of the subjects treated of, only those parts that have life in them, that cannot be eliminated without leaving the subject imperfect, are rare It takes a brave man, and one merciless towards himself, to make a small, simple, but thorough text-book. Such books we must have, if we use text-books at all. If one doubts the propriety of thus cutting down text-books, let him take his best scholar after completing an ordinary book and ask him to write out all he knows on the subject. The book he makes will be small; and, in general, the larger the text-book he has used, the smaller will be the book which represents his own knowledge of the subject.

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I have but two points more to make, and these relate especially to the teacher. There is failure to secure energetic work and the best results from lack of enthusiasm. Without this no teacher can have the best success, however learned and faithful and hard-working he may be. Enthusiasm is the heat that softens the iron, that every blow may tell. Enthusiasm on the part of the teacher gives life to the student and an impulse to every mental power. It gives the work of the school-room a quickening impulse, and by this impulse makes the student a gatherer wherever he goes. It gives to the student independent power; power to go alone. When this is accomplished, there is no more waste in lifting, dragging, or driving. It was the enthusiasm of Linnæus that filled his lecture-room with students from all parts of Europe, and then sent them over the world to gather new treasures for themselves and their master. It was the enthusiasm of Agassiz that clothed the commonest things with new life and beauty; that charmed every listener and transformed the aged and the young, the ignorant and the learned, into joyful learners. Another man, with the same learning, the same devotion, and equal labor, might not accomplish one-tenth as much, because he failed to enkindle that interest that quickens every mental power and lights the fire of latent genius, which, once enkindled, reveals to its possessor truths far beyond the range of those whose minds have never been touched by this life-giving power of enthusiasm. It is said one loses this enthusiasm after a while. Then he ought to stop teaching. If he cannot grow enthusiastic presenting the plainest rules of arithmetic and Latin for the fiftieth time *to a new mind*, then he is unfit for his work, and should spend his strength on stone or clay, which can only yield to force, but never take form at the mere glow of enthusiasm in the worker.

But, last of all, there is a waste that brings loss and sorrow to the world. This is neglect of moral and religious instruction in connection with intellectual training. Who are the men who are causing humanity to blush by their dishonesty and corruption, poisoning the world at the same time that they are cheating it and astounding it? Why, men who are educated, but who despise the slow methods of honest gain and reject the old-fashioned morality of the Bible. There must be a searching for the foundations; and that instruction or that education which does not make prominent *justice* as well as benevolence; *law* as well as liberty; *honesty* as well as thrift, and *purity of life* as well as enjoyment, should be stamped by every true educator as a waste and a curse; for so it will prove in the end.—*Bureau of Education.*

The African Coast.

The surf on the African coast says a letter writter, is ever a wonder and a danger. There is no coast in any part of the world which posseses less ports or harbors of refuge. You may travel a thousand miles almost without finding a cove or harbor where a ship could anchor quietly without being rocked by waves. Try along the whole of the grain, the ivory, the gold and the slave coasts, and there is not one port. But fortunately for ships trading to these places, there is seldom a hurricane or a gale blowing, so that they are able to anchor.—There is never any dead calm, though the sea in the morning is stirred up into wavelets by by the breeze from oceanward. During the night it is moved by land breeze, so that ships anchoring in the roadstead are ever to be seen rolling uneasily; they are never at rest. Unceasingly the long line of waves are to be traced rolling onward to the shore, gathering strength as they advance nearer until, receiving the ebbing water flowing from the beach from preceding seas, there is a simultaneous coiling and rolling, and at once the long line of water is precipitated with a furious roar on the land. Where the water meets a rock a tall tower of spray and foam is sudenly reared, the wave line is broken and is in mad confusion. Where the beach is smooth and of sand you may trace a straight unbroken line of foam, nearly a mile long.—*Ex.*

MISFORTUNES OF GREAT INVENTIONS.

The ribbon loom is an invention of the sixteenth century, and on the plea that it deprived many workmen of bread, was prohibited in Holland, in Germany, in the dominions of the Church, and in other countries of Europe. At Hamburg the Council ordered a loom to be publicly burned. The stocking loom shared the fate of the ribbon loom. In England the patronage of Queen Elizabeth was requested for the invention, and it is said that the inventor was impeded rather than assisted in his undertaking. In France opposition to the stocking loom was of the most base and cruel kind. A Frenchman who had adopted the invention manufactured by the loom a pair of silk stockings for Louis XIV. They were presented to the French monarch. The parties, however, who supplied hosiery to the court caused several of the loops of the stockings to be cut, and thus brought the stocking-loom into disrepute at headquarters.

Table forks appear so necessary a part of the furniture of the dinner-table that one can scarcely believe that the tables of the sixteenth century were destitute of them. They were not, however, introduced until the commencement of the seventeenth century, and then were ridiculed as superflous and effeminate, while the person who introduced them to England was called Furcifer. They were invented in Italy, and brought thence to England; napkins being used in that century by the polite and fingers by the multitude.

The saw mill was brought into England from Holland in 1663; but its introduction so displeased the English that the enterprise was abandoned. A second attempt was then made at Limehouse, and the mill was erected, but soon after its erection it was pulled down by a mob.

Pottery is glazed by throwing common salt into the oven at a certain stage of the baking. This mode of baking was introduced into England in 1690 by two brothers, who went to Staffordshire from Nuremberg. Their success and their secrecy so enraged their neighbors that persecution arose against them, and became so strong that they were compelled to give up their works.

The pendulum was invented by Galileo; but so late as the end of the seventeenth century, when Hooke brought it forward as a standard of measure, it was ridiculed, and passed by the nickname of "Swing-Swang."—*N. C. Presbyterian.*

ENCOURAGEMENT FOR BOYS.

It is said of James Watt, the inventor of the steam-engine, that when a boy he seemed idle and mischievous, and was often reproved for it. When taking off the lid of the kettle and putting it on again, and holding a cup or silver spoon over the steam, he was told by his aunt to take a book or to employ himself more usefully, though his mind was then busy with the greatest problem of the age. If boys show a calculating or inventive genius they should be encouraged to develop it, even though it take time from books.

The father of Eli Whitney, on his return from a journey, inquired as usual into the occupations of his sons during his absence. He received a good account of all except Eli, who it was said had been busy making a fiddle. "Alas," said the father, with an ominous shake of his head, "I fear that Eli will have to take his portion out in fiddles." How little aware was the father that his boy's occupation was the dawning forth of an inventive genius to be ranged amongst the most effective and useful in the world.

It is related of Chantry, the celebrated sculptor, that when a boy, he was observed by a gentleman very attentively engaged in cutting a stick with a penknife. He asked the lad what he was doing, and with great simplicity but courtesy, he replied, "I am cutting old Fox's head." Fox was the school-master of the village. On this the gentleman asked to see what he had done, and pronouncing it excellent, presented the youth with a sixpence.

Let parents study the dispositions of their children, learn the "bent of their genius," and then encourage them in all proper ways to develop themselves. We should never "despise the day of small things."—*Otis.*

WONDERS IN YOUR BODY.

"The proper study of mankind is man," said Pope, and we are so "fearfully and wonderfully made" that the study of the body alone is no very easy lesson, to say nothing of the soul.

Supposing your age to be fifteen, or thereabouts:

You have 200 bones and 600 muscles; your blood weighs 25 pounds; your heart is five inches in length and three inches in diameter; it beats seventy times per minute, 4,200 times per hour, 100,800 times per day, and 36,792,000 times per year. At each beat a little over two ounces of blood is thrown out of it; and each day it receives and discharges about seven tons of that wonderful fluid.

Your lungs will contain a gallon of air, and you inhale 24,000 gallons per day. The aggregate surface of the air-cells of your lungs, supposing them to be spread out, exceeds 20,000 square inches.

The weight of your brain is three pounds; when you are a man it will weigh about eight ounces more.

Your nerves exceed 10,000,000 in number.

Your skin is composed of three layers, and varies from one-fourth to one-eighth of an inch in thickness. The area of your skin is about 1,700 inches. Each square inch contains about 2,500 sweating tubes or perspiratory pores, each of which may be likened to a little drain-tile one-fourth of an inch long, making an aggregate length in the entire surface of your body of 88,541 feet, or a tile ditch for draining the body almost seventeen miles long.—*Science of Health.*