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HONOR OF WORKMEN---THE VALUE OF A GOOD NAME.

That "honesty is the best policy" requires no argument addressed to the intellect, nor moral appeal to the conscience to prove. He who has studied history, used his opportunities for observation, or allowed his own experience to become his teacher, needs no further evidence that it "pays" to be honest. We do not use the verb in only its lower and ultimate sense, but in its true signification; for no condition is so abject as that in which a man cannot respect himself. Injustice or neglect may be borne philosophically, but a consciousness of meanness and a knowledge of deliberate wrong-doing are worse than the brand of Cain, and destroy the manly pride that is the glory of every honest man. He who gives his neighbor the fair return for his money leaves no obligation unredeemed, no promise unfulfilled to return like a "curse come home to roost." The laborer who faithfully works his allotted hours, honestly fulfilling his part of the contract; the mechanic who earnestly uses his best endeavors to understand the job in hand; and the employé who works for his employer as earnestly and honestly as he would for himself, or as he would require others to work for him, know that honesty *is* the best policy. The false economy which induces the "middle man," or merchant, to take advantage of the producer and consumer by belittling the value of the article he buys, and adding improperly to the price of the article when sold, and which encourages the belief among workmen that they gain by the loss of the employer through their negligence or overreaching, is entirely unworthy the character of an honest man, and is also unprofitable. Such cases we believe to be rare among mechanics. No department of our business life is more honorably conducted than that in which the mechanic and employer, the manufacturer and his customer are concerned.

Generally, we believe, our mechanics take such pride in their work that they prefer to suffer a personal pecuniary loss rather than impair their good name. We have known manufacturers to condemn a large number of finished or partly finished articles, and bear the loss of the labor, time, and material expended, rather than risk impairing the good name their perfect work had gained for them. To prevent any injury to his reputation, we know of instances where a manufacturer has so utterly destroyed imperfect work that it could not be used except in its elements, as the crude material, when the loss was counted by the thousands of dollars.

And this sense of honor is no less strong among workmen who depend wholly on their daily work for a livelihood. How often the workman refuses to permit himself to eat his lunch or rest during the hour of recess, preferring rather to rectify an error or to perfect an unfinished piece of work. He will even deprive himself of sleep or neglect domestic duties in order to keep up his self-imposed standard of excellence as a mechanic. Yet in many such cases the workman was paid by the day, with no special consideration of the amount of work performed. But his innate sense of justice, or, rather, his pride in his handiwork, has been the impelling power, even the approval of his "boss" or employer being frequently unexpected and perhaps withheld. The fascination of the exercise of mechanical skill may account for part of this earnestness and self-denial; for scarcely any other employment can equal, in absorbing interest, that of the mechanic who sees, day by day and week by week, the crude materials assume form, and beauty, and at last acquire the quality of usefulness. Yet something must be attributed to the *esprit de corps*, the generous honor of excellence that undoubtedly prevails among mechanics, and preserves the trades from becoming only a resort for miserable mercenaries.

The good name attained by the exercise of this honor among manufacturers and mechanics is really valuable, apart from the comfort of a "conscience void of offense." The prosperity of some of the most extensive manufacturers has been assured, and is maintained simply by the exercise of this honor. We could name a number, both in this country and Europe, which has not depended specially on the monopoly of patents, nor upon any secrets in their business, but on the excellence of workmanship and absolute value of their productions for their fame, which is world-wide. And we could mention mechanics by name who never aspired to the position of proprietors or employers, yet whose loss would be felt far beyond the limits of the establishment in which they are employed or its immediate connections. These are mechanics *par excellence*, whose opinions are decrees, whose honor is unimpeachable, and whose monuments, apart from the admiration of their fellows, are their works.

INUTILITY OF FORTS OF MASONRY.

The recent destruction of Fort Lafayette at one of the entrances of New York harbor, by fire, leaving only the blackened walls remaining, affords an opportunity of judging of the value of such structures for coast defense. Here was no battering of the structure by hostile shot, no shattering by hostile shell; but a simple accident, such as might occur in any dwelling or storehouse, left the defense, so-called, in a few hours a perfect wreck. Indeed, but a few minutes sufficed to render it untenable, the flames driving the last sentinel from his post. If a spark from the chimney of a casemate could so easily and quickly kindle a fire that stopped its ravages only when there was nothing left for the flames to feed upon, and which left the entire structure only a mass of useless ruins, what would be the value of such a defense against the exploding shells of a hostile ship? The fort would prove only a funeral pyre for its garrison.

Masses of masonry, either of brick or stone, are useless against the artillery and projectiles now in use. This was sufficiently proved in the Crimean war, and received many exemplifications during our late civil war. Fort Sumter, after being knocked into a dust heap, was more formidable than when under Anderson it frowned upon the rebel batteries of Charleston. Heaps of rubbish and mounds of earth and sand proved during the war to be more effectual defenses than the best specimens of engineering skill when built of granite, bricks, and mortar. The day of stone forts has passed. If forts are to be built they must be either of sand or earth, affording merely protection to men and guns from the direct fire of the enemy, or of iron, containing their garrisons in a shell, proof against the heaviest shot. But even these are limited in their usefulness for purposes of offense. If located at the entrance of a harbor the train of their guns is limited, and every advantage is in the hands of the enemy with ships at his command. A fort presents a fixed and usually a large target at which the guns of the enemy's ships may practice at will, while those of the fort can reply only when the enemy chooses to offer an opportunity, and then the target is a comparatively small one which is continually shifting its position and offering no satisfactory mark for the gunner.

If stationary forts are to be constructed at all, they should be places entirely inclosed so that dropping shot or shells could no more reach the interior than direct shot. They should also be bomb and shot proof, of material impenetrable to any projectile yet known. That this can be measurably accomplished is susceptible of theoretical proof and even practical demonstration. A system similar to that illustrated in No. 26 Vol. XIX SCIENTIFIC AMERICAN would seem to be greatly preferable to that on which millions are wasted every year.

But we believe that a system of floating, movable batteries would cost less in the first instance, be kept in repair for less, and be vastly more effective as harbor and coast defenses than the most elaborate system of fixed forts and batteries at present in use. Some such system, we are confident, will yet supersede the present inefficient and cumbersome method of national defense.

ABUSE OF THE FRANKING PRIVILEGE AGAIN.

We have frequently called attention to the abuse growing out of the franking privilege. The people now heavily taxed have a right to complain, and it is the duty of the press to expose the rascality which helps to carry up the cost of our mail service several millions beyond its actual receipts. If members of Congress knowingly allow others to use their franked envelopes to promote private schemes, then we say that they are *particeps criminis* in cheating Uncle Sam out of his just dues.

It is evident, that so long as a stamped frank is recognized as valid by the Post Office authorities, there can be no difficulty in reproducing the frank of any member of either House of Congress, the only expense being the cost of cutting the *facsimile* of his signature

The only safe and proper method of guarding against frauds and abuses of this sort is to abolish franking altogether.

We have before us several envelopes covering the pamphlet of a Patent Agency at Washington bearing the stamped frank of Hon. John A. Logan, M. C. We have a letter from a gentleman in Germany in which he orders the SCIENTIFIC AMERICAN. It reaches us under the frank of Hon. J. M. Broomall, M. C. The *Sun* says the frank of Hon. John Lynch is used to pass bags full of New York papers through the mail. It is said that Hon. Demas Barnes franks circulars advertising his plantation bitters. And so it goes on. The people ought to grumble against such abuses until they are stopped; and we hope Senator Ramsay and others who can assist to do so will secure the passage of some bill to put a stop to this iniquity at once.

AERIAL INHABITANTS.

Most people have little idea of what the air we breathe contains. This ocean of mixed oxygen and nitrogen at the bottom of which we mortals flounder about, contains more than is dreamed of in their philosophy. The old spelling book exercises, "Birds live in the air." "Fish live in the sea," would be the substance of their replies, if questioned as to the living things which inhabit air and ocean. But the air is the home of immense numbers of living things which the unaided eye connot perceive, as well as the feathered and insect races. This vital fluid, without which we cannot ordinarily live five minutes, is literally crowded with life; life in an embryotic state it is true, but none the less life on that account.

An egg is a living thing; if you touch your tongue to the ends of a newly laid egg, you will find that one end is quite warm, while the other may be quite cold. So long as that heat remains the egg is alive—an organized being—capable under favorable circumstances of development into a bird of the species which deposited it. When that vital spark of heat is gone the egg is dead and will immediately decay. The seeds of plants are analogous to the eggs of birds, although after they are dead and incapable of germination, they will not decay so rapidly.

There is another class of germs of a still lower order than vegetable seeds. These are minute granules, parts of flowerless plants, which perform the functions of seeds, called spores. A good example of spores is to be found upon the under sides of the fronds of ferns, at the proper season. Spores are not so highly organized as the seeds of flowering plants, but they contain a vitality which, although of a lower type, is longer retained. In fact it is not improbable that some of them retain their power of germination for ages, only waiting for favorable circumstances to become developed into complete growth.

The air has been ascertained to be full of such germs, which, blown about by winds, lodged in crevices of stones in high buildings and tall cliffs, taken into the stomachs of animals with their food or inhaled with their breath, beaten to the earth with rains to rise again in the form of impalpable dust, at length find a proper nidus in which they speedily develope into maturity.

Some of these when breathed or otherwise taken into the system pass into the blood and produce disease. A large class of diseases are now attributed to this cause. Among them is the "Fever and Ague," the pestilence of new and low lands. This disease has lately been attributed by good authority to the presence of microscopic algea in the blood.

So plentiful are these germs existing in innumerable forms and variety in the atmosphere, that Dr's. Smith and Dancer, of Manchester, England, found that there was a quarter of a million spores in a single drop of distilled water which had been agitated in contact with the common air of that locality in a bottle. What myriads upon myriads of these tiny beings must be precipitated upon the earth during a storm of rain.

The microscope, that "wonderful eye which science has bestowed upon mankind" reveals to us these curious facts; and what its ultimate effect upon the sciences at large and medicine in particular, is to be, it is impossible to predict. The telescope is penetrating deeper and deeper into the celestial vault, and constantly telling us new wonders of the starry universe. The microscope on the contrary is dragging to light minute existences that have lain hidden for ages, and is tracing their influences upon the health of mankind. The army of workers with this most fascinating and instructive instrument is daily increasing, and a flood of light is beginning to pour upon many things hitherto most mysterious.

NAVIGATION OF THE MISSISSIPPI---PROPOSALS FOR ITS IMPROVEMENT.

The Mississippi and its tributaries constitute the great natural thoroughfare for the central portions of North America. The importance of improving its navigation and developing the facilities it affords, has been often the subject of thought and discussion since the general settlement by the whites of the one million two hundred thousand square miles which it drains. No other system of rivers can compare with it in extent or in the natural advantages afforded for extended and profitable traffic. It is not a matter of surprise then that in this age of stupendous enterprises, the improvement of these rivers should have attracted renewed attention from the engineering talent of the country. Such being the case, it may not be amiss, before discussing the plans proposed for this purpose, to say something of the peculiarities of the river itself.

The Mississippi is, in round numbers, three thousand miles in length from its source to its mouth, and is navigable at