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(Illustrated articles are marked with an asterisk.)

CHEAP WORKMEN MAKE DEAR WORK.

It is a common complaint, among those who have paid but superficial attention to the relations of work and wages, that high wages in this country make it very hard, if not quite impossible, for our farmers and manufacturers to compete successfully with the cheap labor of other countries. Such complainers fail to comprehend the economic paradox that the cost of labor affords no criterion of the cost of work. Of course there are limits both ways. Labor must not be so cheap that the laborer cannot subsist on the proceeds of his toil, nor so dear that the product is swallowed up in wages. Within these limits, especially where machinery is involved, the economic law is universal; the cost of production, roughly speaking, varies inversely as the wages paid.

This fact comes out very strongly in the special report of Commissioner Wells to Congress in 1868, wherein the relation of work to wages is discussed in minute detail. As a rule the productiveness of the laborer increases with the increase of his pay, and generally at a more rapid rate; and —though modified by other conditions—the economy in production increases accordingly. Taking the puddling of iron as the representative process of the iron trade, Mr. Wells found the average price of labor per day for puddlers was from $1.80 to $1.88 in Staffordshire, $1 38 in France, and from $1.14 to $1.25 in Belgium. The average price of merchant bar iron was $32.50 in England, $35 in Belgium, and $40 in France.

In an address read before a meeting of the ironmasters of the north of England, Mr. Lowthian Bell gave the results of his investigations as to the cost of smelting pig iron in several countries of Europe. Everywhere cheap workmen were associated with dear work. It required forty-two workmen in a French establishment to carry out the same amount of work which twenty-five men were able to do in English factories. With labor twenty per cent cheaper, the cost of producing pig iron in France was $5 to $6 more per tun than at Cleveland.

In Germany, as in France, though the nominal rates of wages were still lower, the actual cost of work was greater than in England. Thus in Westphalia, where labor was twenty-five per cent less than in England, the cost of smelting a tun of iron was $3 75 more than on the Tees.

The same contrast of cheap labor and dear work was exhibited in the report of Mr. Redgrave on the condition of the textile industries in England. Where labor is cheap, the number of hands required to perform a given amount of work more than offsets the advantage in individual wages In France, one person is employed on the average to fourteen spindles; in Russia one to twenty-eight; in Prussia one to thirty seven; in Great Britain one to seventy-four, and not unfrequently mules containing 2,200 spindles are managed by one minder and two assistants. Wages were less in Germany and the hours of labor longer, yet the weight of work turned off was less than would be produced by the same machinery in England, with much fewer operatives. In Russia the inefficiency of the operatives as compared with those of England was still more strikingly manifest. Their wages hour for hour were less than one fourth the amount earned in England; yet the productive power of the English operatives throws the advantage greatly in their favor.

The same condition of things is noticed by Mr. Wells, who shows that, while female labor in the cotton manufacture is paid from $3 to 3.75 a week in Great Britain, from $1.67 to $2.30 in France, Belgium, and Germany, and from 56 cents to 70 cents in Russia, the one thing most dreaded by continental manufacturers everywhere is British competition.

In the carrying-out of his railway and other contracts in every quarter of the globe, the late Mr. Brassey had occasion to employ great numbers of laborers of almost every nationality, at widely different rates of daily wages; yet it was found to be the almost invariable rule that the cost of executing a given amount of work was everywhere much the same. If anything, the advantage in cheapness lay where labor was dearest. Thus the wages paid in England were higher than in any other country: yet bridges, viaducts, tunnels, and all works of art on railways were executed there more cheaply than in any other part of the world. Where labor was plentiful and very cheap, as in Italy or India, simple earth works might be erected at a cheaper rate than in England; but this advantage could not more than make up for the greater cost of the more difficult work.

Numerous illustrations of this fact, and of the law that cheap labor does not necessarily imply cheap work, are given in the interesting volume "Work and Wages," in which Mr. Thomas Brassey, M.P., sums up the results of his father's experience as an employer of labor. Mr. Brassey's first great contract on the continent was on the Paris and Rouen Railway. About 10,000 men were employed, 4,000 of them being Englishmen. The French laborers, working from 5 A. M. to 7 P. M., were paid 60 cents a day; the English navy, beginning at 6 A. M. and leaving off at 5.30 P. M., received $1 25 a day; yet it was found on comparing the cost of adjacent cuttings, in precisely similar circumstances, that the excavation was made at a lower cost per cubic yard by the English than by the French. In the same quarry, at Bonnieres, Frenchmen, Irishmen, and Englishmen were employed side by side, receiving respectively 60 cents, 80 cents, and $1.20 a day. The high priced Englishman was the most profitable workman of the three.

The Dieppe Railway was executed principally by native labor. The French earned from 50 cents to 60 cents a day; when doing piece work their earnings advanced to 70 cents A large number of Belgians, somewhat familiar with railway work, were employed and earned 90 cents a day. The English were considered to be worth $1. Ten years later, when the Caen line was constructed, Englishmen were still employed for tipping and plate laying, and on difficult work on deep rock cutting. Their wages were $1 a day as before, while the usual earnings of the French laborers ranged from 55 cents to 70 cents. The English were employed by experienced sub-contractors directly interested in the closest possible reduction of expenditure. Similarly on the Grand Trunk Railway, in Canada, where a large number of French Canadians were employed at 84 cents a day, English navvies were paid from $1.25 to $1.50 a day, and did the greatest amount of work for their money. Extending the investigation to Mr. Brassey's other contracts in France, Italy, Austria, Switzerland, Spain, Germany, Belgium, and Holland, the approximate uniformity of cost for railway work is exhibited in all cases, notwithstanding great differences in rates of daily wages. So, too, in India. On the Delhi and Umritzer Railway, it was found that, mile for mile, the cost was about the same as in England, although the cost of labor, estimated by its 8 cents to 12 cents a day, was marvelously low. Each laborer did his money's worth, and no more. Skilled labor was scarce and high, and in the absence of experienced sub-contractors the cost of supervision was very great, averaging twenty per cent on the entire outlay.

In Southeastern Europe the same state of things prevailed. Unskilled labor was cheap; but in proportion as skill and manual dexterity were required, the difference in the cost of engineering work disappeared. So too in Italy, in the Mauritius, and elsewhere.

But, it may be objected, in all these examples weak men were pitted against strong men, unskilled against skilled labor; there is nothing paradoxical in the assertion that one hearty, well trained, and well fed workman may accomplish more than two or three untrained and ill fed men, costing each one half or one third as much for daily wages.

The objection may be well taken, but it fails to meet cases like the following, given by Mr. Brassey to show that it is quite possible that work may be more cheaply executed by the same workmen, notwithstanding that their wages have highly increased. At the commencement of the North Devon Railway, the laborers received 48 cents a day. During the progress of the work their wages were raised to 60 cents and 72 cents a day. Nevertheless it was found that the work was executed more cheaply when the men were earning the higher rate of wages than when they were paid the lower. Again, in carrying out a part of the Metropolitan Drainage Works in London, the wages of the bricklayers were gradually raised from $1 50 to $2.50 a day; yet it was found that the brickwork was constructed at a cheaper rate per cubic yard after the price was raised than before.

An indirect way of raising wages is to reduce the hours of labor. The evidence is very strong to prove that, with the same men, such advances in the cost of labor do not necessarily increase the cost of work. Indeed it may be said to be the universal rule that beyond ten hours a day the production diminishes as the time increases. With proper diligence, eight hours are enough for a man to do all he is capable of doing daily, with profit to himself and his employer.

THE RELATION OF ALCOHOL TO PHYSICAL STRENGTH

A correspondent asks: (1) Is there not a clashing of authorities in regard to the relation of alcohol to physical strength, as indicated in our recent article on alcohol, food, and force? (2) Whose experiments were therein referred to? (3) How it is possible for a dose of alcohol to increase one's working power, if, as Todd and Bowman state, "the use of alcoholic stimulants retards digestion by coagulating the pepsin of the gastric juice, thereby interfering with its action?" He adds that he does not find in his text books any authority for the position that alcohol is a force producer.

There is a serious clashing to be observed among current opinions in regard to the action of alcohol in the human system, due very largely to the fact that the effects of alcohol vary immensely with the dose, but more perhaps to the tendency of men to come to decided conclusions from one-sided or insufficient evidence, and to hold to such conclusions in spite of every evidence to the contrary.

Regarding authority in the only sense admissible in Science—that is, as the overwhelming weight, not of human testimony, but of facts, critically determined—we cannot say that the alleged clashing is at all serious. The physiological action of alcohol has been determined with as close an approximation to accuracy, probably, as that of any other substance; and while it is never possible to speak with absolute certainty in such matters, we are justified by fact in saying that the grounds for regarding alcohol as a force producer are quite as substantial as those on which we rest our belief that beef, or bread, or any other food is a force producer.

The failure of our correspondent's text books to recognize this result of recent investigations is due very likely to their having been written before the investigations were made. The latest work of eminence in this field—Parkes's "Treatise on Food and Dietetics, Physiologically and Therapeutically Considered"—gives a very good discussion of the *role* of alcohol within the organism, and admits that, up to the time of its publication, the probabilities were, on the whole, in favor of the belief that alcohol is a force producing food. Investigations still more recently published, notably by Drs. Anstie and Dupré, carry the discussion to the point of practical demonstration, as we have shown in another column.

The experiments, about which our correspondent inquires, were those narrated by Dr. Hammond in the address then under review.

As for the quotation from the works of Todd and Bowman, the facts would seem to prove it perfectly correct, with the addition of the first two letters of the alphabet. It is not the use but the abuse of alcoholic stimulants which has the effect described as every drunkard's stomach stowed after a debauch. In excess alcohol arrests digestion, as it arrests all the other bodily functions. In excess it is a poison, a very dangerous narcotic poison. Nevertheless in proper doses, properly administered, its use has quite the contrary effect. It facilitates digestion and is otherwise strikingly beneficial. Its indiscriminate use, however, is always and everywhere to be deplored, since only the few are able to use it without abusing it and themselves at the same time.

Because a little at the proper time is good, too many people are apt to infer that a great deal at any time must be better. It is the logical weakness, so happily hit off in Æsop's fable, of the old woman with her hen. Because with one measure of barley the hen laid an egg a day, the thrifty dame reasoned that two measures of barley would make her lay two eggs a day. But they did'nt. The hen simply got fat, and quit laying altogether.

As with alcohol, so with tobacco, so with articles of food like tea, coffee, spices and the rest, so with common necessaries like pure air, cold water, exercise, sleep, pleasure, there are ill balanced people who are never able to discriminate between wholesome use and excess. In time, with the spread of real knowledge, with increasing mental and moral culture and the general elevation of the race, such weaknesses may be outgrown. Till then they must be borne with. To attempt their repression by force is more likely to be mischievous than beneficial, more likely to hinder than help the real advancement of society.

THE LABOR PROSPECTS FOR THE WINTER.

The condition of the labor market in this city is such as to warrant the apprehension of serious trouble among the working classes during the coming winter. Thousands are already clamoring for work. So far from being better than during the darkest days of the panic, the laborers are certainly worse off; and for this gloomy and stagnant state of affairs no definite and certain reason can be assigned.

The New York *World* has investigated this subject very carefully, and the long detailed report which appears in the columns of that journal bears out by actual figures the sinister opinions above given. In rough numbers, there are 30,000 ordinary laborers in this city, on whose work the existence of an aggregate of 150,000 people depends. To determine how large a proportion of this part of the population is idle, recourse has been had to the sources of employment of the greatest numbers, beginning with the city itself. The employees in the municipal service, it appears, have fallen off fully one third; or in other words, 2,000 men, out of the aggregate formerly employed, are out of work. The pay rolls of the Fourth Avenue Underground Railway improvement, by reason of the approaching completion of that work, have been reduced by about the same number; and further examination shows that the ratio of reduction in these two largest sources holds in the cases of smaller operations. Building is stagnant, and but few improvements are being made on lot property; contractors are hampered for funds, owing to the difficulty in raising security, and the

disagreements among the heads of the city government have exercised no small influence in the cessation of small jobs, which employed men by the fifties and hundreds. Taking, then, the ratio of decrease as above noted, and applying it to minor operations, a total of ten thousand men are shown to be out of employ—fully one third of the unskilled laboring population. These are the day laborers, who work, by the score or more, under contractors.

Turning next to the manufactories, we find a class of men who are not connected with the industry as pursuers of the same. They are not mechanics, nor do they fulfil such special functions as the teamsters or porters. They are mere workers, using their muscles at whatever job they are set to perform. Of these 8,000 are idle, for, from the 7,624 establishments about New York, they were the first to be discharged, and so added to the roll of the unskilled unemployed.

From careful investigation it further appears that, on each able bodied man of the class of society to which these people belong, no less than four persons are dependent. Hence there has been added to the pauper population not merely 18,000 men, but five times that total, or 90,000 souls, and this in November. Compare this aggregate with that of February of the present year—the closing month of winter, when the drain upon the public and private charities is always greatest. Then the total was 80,000; now, at the opening of winter, the figures are 10,000 higher. With regard to wages, in all departments of skilled labor and in all factories the standard has been maintained, with a few isolated exceptions. In coarse and unskilled labor, the reverse is the case. Up to the panic, the usual rates were $2 per day, or $12 per week; at the present time, very few contractors are paying over $1 50 per day. The Italian laborers are getting but $1.25; and railroad contractors in adjoining States are paying that sum, and picking men beside. The comparison between this state of affairs and that of fourteen months ago is a striking one. The pay roll then was: 30,000 laborers at $2, $60,000; 8,000 laborers employed by factories, etc., $16,000; total, $76,000. The pay roll now is 4,000 laborers on city work at $1.75, 7,000; 16,000 laborers on private enterprise at $1.50, $24 000: total, 31,000. Difference between 1873 and 1874, 45,000. Average share then to each man, $2; now, 67 cents.

It is a fact that the necessaries of life are not a whit less costly now than they were a year ago, so far as the poor man is concerned. The wholesale dealer buys his goods in gross, perhaps, cheaper; but the retailer, with lessening sales to contend with, has no reason to reduce his prices. In rent, a week's wages generally pays for one month; but this relation was adjusted before wages were cut down, so that, to provide shelter for himself and family, the working man pays not twenty-five per cent of his earnings, but fully thirty-one per cent. Coal is dearer than a year ago; if it remains at ruling rates, and counting the consumption in each family of five persons at seven pailfuls per week, fifteen per cent of wages after the rent is paid must be devoted to its purchase; and thus we might continue through the necessaries of life, showing that not merely is utter pauperism staring the unemployed in the face, but even those who look to their day's work for their day's living are menaced with privations and suffering.

One result of this condition is beginning to be apparent in the diminution of immigrants from Europe, and the remarkable increase in steerage passengers leaving this country, avowedly to seek labor in England. Five hundred souls left this port in an Iceman steamer a week or two ago, and on one Saturday 2 000 working people sailed for Great Britain, Germany, and France. This is a bad showing, and raises questions relative to the existing tariff and the national finances, which the coming Congress must take into very serious consideration. The immediate relief is in the hands of the charitable Public institutions are destined to be taxed far beyond their capabilities, and private charity will be called upon within the next six months as never, we think, before. Provision for meeting the outcry for food should begin at once, not delayed until the sad tales of starvation and misery fill the police reports.

It is, moreover, a serious question for capitalists and moneyed institutions to reflect upon, whether they would not serve their own ends of gain best at this time by giving these thousands of idle men the means of helping themselves. It is certain that a large number of deserving poor are, within a few months, to be thrown as a charge upon the city and county. They must be supported, and that in idleness, since, as we have already said, municipal employment offers no opening whatever. Would it not be wise for some of our great moneyed institutions to put out some of their money in aid of desirable local enterprises which will give the workmen employment? We can think of no better example than the case of the Broadway Underground Railway. The road is a direct continuation down town of the tracks of the splendid Underground Railway on Fourth avenue, and the approaching completion of the latter marks not only the feasibility and advantages of such a route within corporate limits, but also suggests the present as the best period for proceeding with the work. The plans of the route are complete, are approved by the best engineers, legislative sanction has been accorded to the project, and nothing remains but the acquisition of capital sufficient to initiate operations. A source of labor will thus be opened during the winter for eight or ten thousand men, and forty thousand people, nearly half of the total number of unemployed, will be furnished with a means of sustenance. As an investment, a first mortgage on a line through the very heart of the city, none better exists. In fine, it would be difficult to conceive of any other project now extant, capable of offering three such great benefits as work to the unemployed, relief to a population earnestly seeking a means of rapid transit, and a safe investment for capital contributed to its promotion.

THE SENSATION OF PAIN IN THE LOWER ANIMALS.

Does the insect, which we thoughtlessly crush under foot, suffer as much pain as we should were we similarly destroyed? It is generally conceded that the proper answer to the question is in the negative; and in fact it would seem much more in accordance with the wisdom displayed throughout the creation of animated nature, that those beings which from their very essentials are subject to wholesale destruction should be spared the pangs incident to the throes of dissolution. No one, except perhaps that most refined of humanitarians who had scruples about drinking water on account of the sufferings he might cause to the animalculæ therein, supposes that any real sensation of agony is experienced by the zöophyte which we tear from the rock, or by the oyster as we cut it from its shell; but there are many who contemplate the sport of the angler with horror. and who see, in the writhings of the worm on his hook or in the struggles of his finny victim, all the tortures of human mutilation. Where then, at what particular class of being, is the dividing line to be drawn? Are only radiates and mollusks apathetic to dismemberment, or do they also experience sensation, and how far in the ascending scale does the insensibility to pain extend in its decreasing ratio?

It seems to us, and we have no doubt biological fact will bear us out in the view, that the accidental influences of cultivation, of breed, of education in human beings, and also of differences in delicacy of nervous organization, play an important part in determining the degree of suffering. It is well known that a savage will bear pain, not merely in absolute stoicism, but apparently unmindfully, which if inflicted on a refined and cultivated individual would produce death or syncope. And this is not merely confined to the barbarian but extends through all grades of society. Physicians state that the sufferings of childbirth are as nothing to the squaw, or to the woman who constantly performs coarse manual labor, when compared with those of the delicate females of our upper classes. The same general rule applies to the lower animals; a finely bred horse winces under a lash that the dray brute would not notice, and the trained hound will yelp at a blow of which a street cur would think nothing. With this distinction in varieties of species before us on one hand, and the fact that both reason and general belief point to the insensibility of lower animals on the other, we are brought to the consideration of an interesting argument, raised by Dr. Crosby of this city, in defence of the practice of vivisection. It is advanced, as a generally received proposition, that the sense of pain is designed for the self preservation of all animals, and further that each is endowed with this sense to an extent only sufficient to ensure the result. That is, in other words, that an insect, for example, has a sufficient sense of suffering to keep him from walking on a hot coal; but if we threw him into the fire, his agony would be comparatively nothing as compared to that of some higher animal in whom the sense of pain is implanted for a greater and more complicated variety of purposes.

It is very difficult, almost impossible, to judge of the existence of pain in an animal by its mere physical contortion. A human being under the influence of ether, during an operation, often writhes and screams as if in great torture, and yet nothing is felt; similarly people in convulsions show every external sign of suffering, and yet, beyond mere muscular soreness due to exertion, none is present. Nor is the cry a proof of pain, for, as Dr. Crosby says, a pig will yell just as lustily, if he be merely held as he will under the infliction of a severe wound. We may judge, however, with greater security, from coincident actions on the part of the creature, as to whether suffering is or is not present. If a man, for example, while undergoing a surgical operation, should, as in a case we once saw, coolly ask the surgeon, and complacently munch an apple while the knife was penetrating his flesh, ordinary reason would lead us to the belief that his assertion that "it did not hurt" was true, and this even did dumbness prevent his stating the fact. If such be true in the one case, and in that of the animal which we know to be most acutely sensible, then it is logically true in the instances of lower orders which we are sure possess sensibility in a less degree; and hence if a horse, as in one of the cases cited by Dr. Crosby, have a fore leg shot off in battle, and thirty-six hours afterward be found quietly grazing, although the stump is horribly mutilated, then it is reasonably certain that the pain is not proportionate to the lesion, if indeed present in any degree whatever.

It is well known that animals often inflict on themselves injuries which apparently must cause suffering, and yet every indication proves the same to be absent. Rabbits have torn themselves free from traps, and been found feeding *minus* two legs. Rats when pressed by hunger will eat their own tails. We have seen pigs, after their throats have been cut, cease their cries and attempt to eat, and it is said that the same animals when stuck unawares often pay no apparent attention to the wound. It is curious also to notice that rabbits and rats, which can support themselves even if their locomotive process be injured, will bite off their feet if caught in traps, but that a carnivorous animal like the fox will never do so, for, once unable to run, he would starve to death. In the first case there appears to be no sense of pain to prevent the action; in the second, the sense certainly exists.

Again, crabs and lobsters drop their claws when frightened, and seemed unhurt. There is a little lizard in Sicily, which, when suddenly alarmed by the blow of a cane on the rock near to it, will break off from its tail and scamper away, running into obstacles in its path acting very like a ship without a rudder. Sir Humphrey Davy came to the conclusion that in fishes the sensation of pain was very trifling and the view seems proved when it is considered how infinitesimal the number of fishes which arrive at maturity is, compared to the myriads of ova deposited.

A wasp will eat after it is cut in two; so will a dragon fly when impaled; and that the insects should suffer to any degree seems on its face impossible, particularly if the millions and millions which the birds eat be thought upon.

There is besides a very curious provision of Nature which is little understood, and which comes into play, it would appear, in all animals in the presence of imminent destruction or in cases where great pain presumably exists, either to be inflicted by a natural enemy. We allude to the action of a mouse when in the power of a cat, or of a rabbit when seized by a weasel. In the last instance the rabbit remains motionless, without a sign of pain while being killed; he is apparently, as the expression is, "paralyzed by fear." So also a mouse, and precisely so with man, for Dr. Livingstone's description of his sensations while being shaken by a lion exactly accords with such as we might imagine would be the experience of the mouse, when in the claws of the cat.

But while there is every evidence that the suffering of the lower animals is certainly less than that of man under similar circumstances, we cannot, however, coincide with the idea that it is so far absent, in the case of the brutes ordinarily sacrificed by vivisection, as Dr. Crosby seems to convey. As he states, however, an anæsthetic disposes of the question at once; and in general it is much more humane (and besides is an error on the safer side) to give the unfortunate beasts the benefit of the ether, as well as that of the doubt as to their sensibility.

Straw Lightning Rods.

The *Journal of the Society of Arts*, London, and other papers have given currency to a statement, derived from a prominent French paper, to the effect that lightning rods made of straw had been used in France, and found quite as effective for protection as metal rods, and far cheaper. President Henry Morton, of the Stevens Institute, has written an interesting reply to this statement, given in another column, in which he shows the utter absurdity of the straw lightning rods, and also takes occasion to point out, in a very clear and satisfactory manner, what kind of a rod is necessary to ensure protection, how it should be arranged upon the building, etc. This article will, we are confident, be studied with interest by all who are really desirous of possessing correct information upon the subject.

SCIENTIFIC AND PRACTICAL INFORMATION.

FALL SICKNESS.

In a lengthy article on the above subject, Dr. Hall concludes that if persons in the country where intermittent fevers prevail would adopt the precaution, in early fall, to take their breakfast before going out of doors, and keep a blazing fire upon the hearth in the living room during the morning and evening, fevers and chills would almost entirely disappear as a prevailing disease.

The importance of ridding apartments of the dampness and sharpness of the morning and evening air, and the expulsion of all miasmatic particles, cannot be over estimated by those who would have good health.

THE FRENCH AND ENGLISH TUNNEL.

The project for the tunnel under the English channel has been officially transmitted from the French Government to the English Foreign Office. Among other plans, it is suggested that the means of inundating the entire bore should be placed in the hands of each government, so that, in case of war breaking out between the two countries, the work may be rendered useless. It is calculated that a force of 2 000 horse power, operating for two months, would be sufficient to pump the water out of the tunnel.

A NEW WHITE ALLOY.

This metal, recently invented by M Delalot, is said to be very cheap, and to possess qualities rendering it suitable to replace the various white alloys now in use. The proportions are pure red copper 80 parts, oxide of manganese 2 parts, zinc 18 parts, and phosphate of lime 1 part. The copper is first melted and the manganese added little by little When the latter is dissolved, the phosphate is similarly mingled. The scoria is removed and finally the zinc is added about ten minutes before casting To accelerate the fusion of the manganese, ½ part fluoride of calcium, ½ part borax, and 1 part wood charcoal may be used as a flux.

THE Boston Board of Fire Commissioners, taught by the recent calamity at Fall River, have issued a circular calling the attention of persons who have on their premises apparatus for preventing the spread of fires, to the necessity of a regular inspection of and instruction and drill in the same. They advise that printed cards, explaining the construction, arrangement, and use of such appliances, be posted where they cannot fail to be seen, and that the occupants be drilled as often as once a week in the use. Where fire escapes are attached to buildings, the board recommend that they be frequently used and examined.

MR. THEODORE J. HARBACH, of Philadelphia, has designed and executed, for the great Centennial event, dies for medals, of a number of historic subjects, such as Old Independence Hall, the Old Cracked Liberty Bell, a Head of Washington, etc. On the obverse sides, persons can have their business cards, making a novel and durable advertisement, which the possessor is likely to keep.