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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—Parry'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