

Each Worker Loses 9 Days Yearly by Illness

Lack of Attention to Principles of Modern Industrial Hygiene Responsible at Present for Enormous Waste in Our Factories

In these days of great industrial activity much thought has been given to the mobilization of our industrial forces, and when we consider that the vital resources of our country are five times as great as our material resources we must pause for a moment to see what may be done for the conservation and mobilization of this immense national asset.

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IF we were to stop for a moment to consider the cost of sickness among the wage earners of this country, we would be appalled at the stupendous total. There are 30,000,000 workers in the United States whose average annual loss through illness is about nine days each. This is equal to 739,736 years each year, and as the average daily wage is estimated at \$2.50, and the cost of medical attention at \$1 a day, the annual loss to these 30,000,000 workers would be over \$945,000,000. The loss due to premature decline or to reduction in productivity, the result of continuous operation of industrial health hazards, cannot be estimated.

The loss to the worker is not the only one incurred; we must take into consideration the one sustained by the employer, amounting to about \$5 a day, or \$1,350,000,000. I will refer again to this side of the question.

Modern industry is a paradox. It tends to produce disease and misery; it affords every requisite for the enjoyment of good health. It produces food, clothing, books, shelter, the means of travel, recreation, and enjoyment. Each year's increased wealth produced by industry enables us to arm ourselves successfully to fight disease and death.

It is a generally accepted principle of modern sanitary science that a large amount of sickness, in industry or otherwise, is preventable, and that the average duration of life can be materially prolonged by deliberate and rational methods of personal, social, and industrial hygiene. It is safe to assume that at least 25 per cent. of the sickness among workers can be prevented, thus diminishing present losses by about 67,500,000 days a year, resulting in a saving to the workmen of \$168,750,000 plus the gain in productivity of \$337,500,000, making a total economic gain to the nation of \$506,250,000.

As a matter of dollars and cents, then, no industry ought, per se, to exert an injurious influence upon the health of the worker; but this subject will not receive the attention it deserves from employers until it is brought home to them. Few employers have attempted, even under intricate systems of cost accounting, to estimate the loss sustained through sickness and injury to their employes, and yet it is not such a difficult problem, for Edgar M. Atkin of the Yale & Towne Manufacturing Company offers the following solution:

Divide the payroll for any period by the number of employes to obtain the average pay for each man. Add the payroll to the cost of all materials which enter into the making up of the product, subtract this sum from the total income from sales, and divide that amount by the number of employes who worked upon that product, and the result will indicate the average amount each workman produced over and above his wage.

If the plant were shut down, the payroll would be a loss to the workmen only, and the cost of the raw material would be a saving to the company. The amount of sales over and above the payroll, and the cost of materials, would be the sum which the company would lose for the period of the shutdown. It will be found generally that the average wage per man per hour throughout the United States will be close to 25 cents.

I think I am safe in asserting that the

money which a company must make over and above its payroll to carry on a profitable business is about 50 cents an hour for each man. Therefore, it is fair to assume that if one man stop work for one hour, he will lose 25 cents and the company will lose 50 cents. This, of course, is true if work stop because of injury or illness. In those States where a workmen's compensation act is in force, a company must pay after the first two weeks of the injury 50 per cent. of the workman's loss of 25 cents, making the loss to the company for that accident per hour amount to 62½ cents, as against the workman's loss of 12½ cents, or half his wage.

Considering that the vital resources of our country are five times as great as our natural resources, we must appreciate that this question is at the root of our social fabric. It includes the relation of capital to labor, the relation of man to his fellow-man. William H. Allen says:

There is no sacred right to work when our work involves injury to ourselves and our neighbors. Work at the expense of health is an unjustifiable tax upon the State. It is the duty of society to protect itself against such a depletion of national efficiency. Therefore, the State has a right to pass laws and enforce them that will make industries safe not only from accidents, but from ill-health.

The employe has a right to demand protection from unhealthy work, the right to have work fitted to the body, and healthy surroundings. The employer has a right to demand that his employes shall keep themselves in good physical condition and that the State shall enact such sanitary laws and regulations as to housing, drinking water, and the protection of food supplies as may be necessary to enable the workers to keep at the highest point of physical efficiency.

Normally, work should be a benefit both to the mind and body. All are better for active daily work. But the work place should be most healthful, for modern science enables us to erect factories of concrete, steel, and glass that are fireproof and perfectly lighted, ventilated, and heated. Industry, however, without such conditions exerts a continuously injurious influence upon the masses who toil, and preventable disease and early death are its unprofitable by-products.

Let us consider for a moment the evolution of the worker and his environment. A little more than a century ago manufactured articles were the products of the worker in his home. As the process grew he called in his neighbors to help. Business increased, the home was no longer suitable, a shop was added to it, and, as this was again outgrown, new and larger quarters were erected. Still growing and needing more help, the business either attracted the workers to it or the business moved to the workers, and this resulted in congestion of population.

When we consider that the worker spends from eight to twelve hours a day for six or seven days a week, fifty-two weeks a year, extending over a period of thirty years, we see the tremendous influence that is exerted on his health by the conditions under which his work is done.

The conditions that affect the health of the worker are, first, the natural climatic ones, local environment, sanitary and hygienic regulations, the occupational hazards, the irregularity of employment, and the economic disadvantage at which a large portion of wage earners and their families are placed as a result of low wages and insufficient natural income.

The occupational hazards depend upon the nature of the products. They may be naturally harmful, such as metallic poisons, dusts, gases, vapors, and fumes, or the conditions under which the work is done may be unsatisfactory as to heat, moisture, cold, confined air, overcrowding, compressed air, excessive light, muscle or nerve strain, and the like.

Undue fatigue, a common cause of ill-health, is most often brought about by long hours, the piece-work system, and the increasing use of machine methods.

Work performed by any of the body cells produces waste products and other changes in these cells. Up to a certain point this condition is not harmful, but when work is excessive or too prolonged, or done too rapidly, the waste products begin to accumulate, the cells become exhausted, the physiologic changes fail to occur, and, if not properly rested, the cells are damaged. Fatigue is a self-created poison, and it is becoming more clearly recognized all the time that undue fatigue is a most pernicious health hazard.

As already asserted, the first work place was the home. For years the factory was but one remove from a shed attached to the employer's home. The light, heat, and ventilation were totally inadequate; in fact, it was practically impossible to improve those conditions owing to the construction. Today, however, with our knowledge of building, no employer can afford not to supply these most important factors.

No conditions affecting the health of workers are of more importance than those of heating and ventilation. Robert Boyle, among the first to investigate the influence of atmosphere, says:

The generality of men are so accustomed to judge of things by their senses that because the air is invisible they ascribe but little to it and think it but one remove from nothing. Yet, unobtrusive though the atmosphere be, it is many removes from nothing, and has tremendous physical and mechanical potency, and even if we could live without it we would be deaf and dumb on a frozen earth under a starry, black sky with a blue sun.

While recent studies have shown that the air is not to be feared as a frequent medium for conveying specific infections, it has been demonstrated that an abundant supply of well-conditioned air is necessary to perfect well-being. Proper lighting of the workroom is most essential. Good daylight and much sunlight are necessary factors in well-conditioned air. Insufficiently lighted workrooms are the usual cause of eyestrain. This not only impairs efficiency, but oftentimes it begets headache, nervousness, and digestive disturbances; poorly lighted rooms are considered by many physicians to be a common cause of anaemia. Well-lighted workrooms make for cleanliness, both personal and industrial.

There are certain processes of manufacture that are inherently dangerous, and, no matter what precautions are taken, there will always be more or less sickness resulting. The so-called occupational diseases may be defined as

Maladies due to specific poisons such as mechanical irritants, physical and mental strain, or faulty environment resulting from specific conditions of labor; they may be either acute or chronic; they may cause instant death, more or less prolonged invalidism and incapacity for further work, or may lay the foundation for other diseases of equal or greater hazard. They are for the most part due to the outcome of conditions of modern life, whereby new combinations of substances are being constantly employed in the arts and manufactures. In the operation or control of machinery there are special uses of nerves and muscles, and special strain results from lack of variety in work concentration and the haste involved in competition or "speeding up." Besides, the diseases due primarily to hazardous occupations, pneumonia and tuberculosis readily attack those whose constitutions have been undermined by their work.

Among those substances that are inherently dangerous are metallic poisons, toxic gases, vapors and fumes, toxic fluids such as alkalis, acids, dyes, irritant dusts and fibres, and organic germs.

While we are quite familiar with the specific poisons, there are large numbers of workers, infinitely greater in the aggregate, who are subjected to the constant perils of unsanitary and unhygienic surroundings. It is impossible to classify them, for they exist in a greater or less degree in 90 per cent. of all our industries. It is in this field that industrial hygiene can be of the greatest benefit.

To improve the hygienic conditions of the worker, three fundamentals are essential: investigation, education, and laws. A discussion as to the necessity of these three basic things must be approached with no little hesitancy, for the results to

be effected are so far-reaching that a successful plan must be based upon a sound and practical foundation.

Education should not be confined to the worker and his employer, but must include the general public, because the history of all our constructive health legislation of the past shows that an enlightened public is necessary to success. This education must be intensive, for the investigation has and will point out many revolutionary ideas, and laws will not be passed nor be enforced until the public is ready. Doctors, too, need education along these lines.

Today the honest and aggressive employer is asking himself, "What elements can I bring into my business that will increase the output, reduce the cost of production, and at the same time raise the wages and earning capacity of my employes?" In these days of great industrial stress it is necessary that this question be answered, and if there is any one factor that more nearly affords a solution, it is that of the intelligent application of industrial hygiene.

In the whole domain of preventive medicine there is nothing that offers such satisfactory and immediate results as the study and application of the principles of industrial hygiene. This term is broad enough to include all sanitary and hygienic conditions that surround the worker while at work; yet it is restricted by some to the efforts made by altruistic and far-sighted employers in the interest of employes, while others think of prohibitions and mandates in the name of the State that either prevent certain evils or compel certain benefits. For too few it refers to what the worker does for himself. It is a subject in which the medical, economic, and sociologic aspects are closely interwoven, and it requires a broad grasp and intimate knowledge of the conditions to avoid the dangers and correct the injustices to which working people are subjected.

In the early history of medical work in industry, the regular employment of a physician in an industrial establishment was usually considered an evidence of a largely benevolent attitude toward the employe. Whether or not this were true, the results showed that the work of the doctor proved beneficial to the employer as well as to the employe, by protecting both against undue expense arising out of injury and sickness and by promoting a better mutual relationship.

Soon it was found that with the doctor came increased production. The greater value of the doctor in the work became even more generally realized when workmen's compensation laws went into effect. These put the burden of the expense of injury upon the employer, and he was obliged not only to provide adequate medical and surgical treatment, but also to use every effort to prevent future accidents and to eliminate conditions that might prove harmful to the health of his employes.

In a large plant in Massachusetts it was found that injured men who took advantage of the company hospital saved nineteen and two-tenths hours a month over those who sought outside medical aid, and out of 4,000 cases of accidents there were only two mild cases of blood-poisoning. This is not so remarkable as it might appear because proper attention to wounds eliminates this condition.

If I were briefly to summarize the benefits of industrial hygiene, I should say that it has resulted, first, in a decided improvement to employes in sanitation, hygiene, and hours; in a reduction of undue fatigue, in the minimum of risk among the occupational diseases, and in fitting workers to jobs for which their bodies are best suited. I would emphasize the fact that for the employer it results in increased production in direct proportion to the health of the employe, and, lastly, that the benefits to be derived by the community at large from happy, contented employes, working under the best conditions, enjoying not only their leisure, but their working hours, are incalculable.